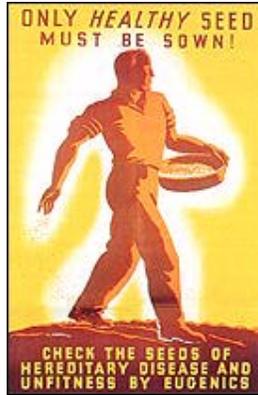


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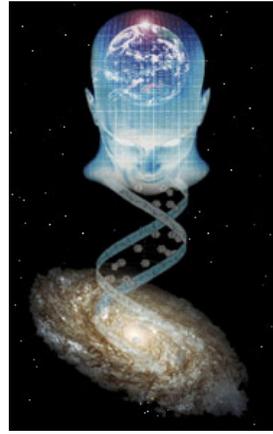
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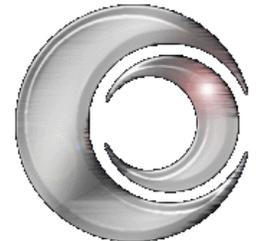
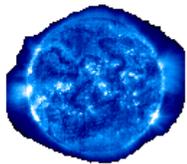
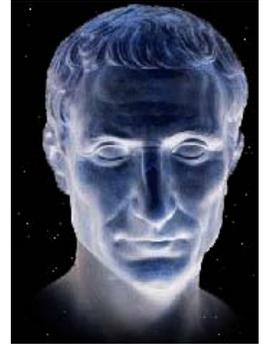
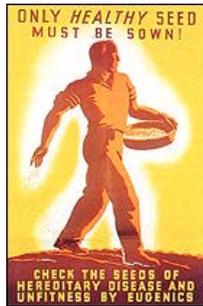
We in the Eugenics movement are not interested in competing against Adolph Hitler or Karl Marx for some minuscule little 1,000 year Reich. We are interested in competing with Jesus Christ and Buddha for the destiny of man.

Neo-Eugenics Manifesto By Prometheus



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"Yes, There is Such a Thing as Race" By John Alexander

This paper will start by making an assertion that many politically correct academics would consider frustrating, alarming and infuriating: "Race exists as a biological concept." Despite the unpopularity of the idea that race exists, slightly over half of all biological/physical anthropologists today believe in the view that human races are biologically valid and real.¹ Although the simple statement "race exists as a biological concept" might make many feel uncomfortable and want to bury their heads in the sand, this paper will attempt to prove that the statement is true. Before doing so, however, it should be noted that this paper focuses only on the question of whether there is such a thing as race. It will not discuss concepts of racial inferiority or superiority and nor will it even attempt to examine the scientific utility of classifying humans by race. The focus of this paper, as stated upfront, is entirely limited to whether race exists as a biological concept. **Definition of Race** First, there are easily-perceived traits such as hair and eye color, body build, and facial traits which vary among human population groups; these differences are easily perceived by the layman; and these traits are determined at least partially (and perhaps wholly) by ancestry (genetics).² Race then is simply the label given to that human population grouping. In other words, as population geneticist Steve Sailer has put it, race is a lineage; it is a very extended family that inbreeds to some extent.³ Under this definition, race and ancestry are synonyms. Other synonyms for race are cluster, population, statistical collections of alleles, cline, clinal grouping, lineage, and regional pattern. The aforementioned are all terms that many population geneticists use instead of race;⁴ however, these terms all mean the exact same thing as race. Note that race does not mean the same thing as "species," if the word species is defined as a biologically distinct breeding unit.⁵ Because it is possible for members of different racial groups to breed with one another, the races are not separate species. Also, it is not possible to take any given human and unambiguously classify him or her as belonging to one particular race (as would be required with species classification). Race in the biological sense therefore is more a statistical concept. It is, to put it plainly, simply a major division of the human species grouped by ancestry. **Racial Traits** A race is distinguished by a particular combination of inherited features. Anthropologists

A Call to Action

The trap of the non sequitur

It's quite reasonable to imagine that, had Hitler never been born, the Eugenics Movement of the early 1900's would have continued to flourish, and there would be eugenics programs in place in most advanced countries today. Policies would evolve to make use of new knowledge of genetics as it was acquired, and people would take eugenics for granted as merely "common sense," and "just basic human kindness." But unfortunately, the vagaries of history and limitations of the human mind have conspired to construct a psychological trap which has thus far prevented any serious discussion of eugenics since the end of World War II. The "trap" is the universally accepted belief that "Hitler supported eugenics, so eugenics must be evil." It seems incredible that this non sequitur has totally paralyzed the Western world on the issue of our own evolution for decades. There were 28 other countries besides Nazi Germany that practiced eugenics, and nothing monstrous happened there. Sweden's eugenics program lasted 40 years. Like Pavlov's dogs, we in the Western world are the objects of conditioning. Pavlov rang a bell just before feeding the dogs, and soon they began to salivate at the sound of the bell. We have heard "eugenics" paired with horrific stories of Nazi atrocities so many times that we now feel negative emotions upon hearing the word, and we fear and hate the very idea of it. Like a knee-jerk response, it may not be rational, and it may not be fair, but that doesn't matter to the more primitive mechanisms of our brains. Fortunately, such conditioning can be extinguished. There are numerous studies in the psychological literature on this. The bottom line is that if Pavlov starts feeding his dogs without ringing the bell first, then gradually the dogs will cease salivating at the sound of a bell. Similarly, if people see, hear, read, and talk about eugenics when it is not coupled with frightening images of the Holocaust, then eventually the conditioned negative emotions towards it will fade away. Making this happen becomes the responsibility of all of us who support eugenics.

The non sequitur joins forces with the unfavorable Zeitgeist

The Zeitgeist of the Western world at the turn of the millennium is completely and utterly unfavorable to eugenics. All the facts that comprise the edifice of scientific knowledge upon which it rests have been declared verboten by the liberal Thought Police. These are not matters of opinion, these are scientific facts. Twin studies and adoption studies have found that all traits have some genetic component--intelligence, kindness, phobias, political beliefs, favorite colors, sexual preference, religious faith, vegetable aversions--and on and on and on. IQ is more a function of heredity than it is of environment--adopted children show no correlation with their adoptive families whatsoever by the time they are grown. Yet these facts have been deliberately kept from the public by the media and academia, and branded "racist."

Thankfully, Communism as a political system has fallen into "the ash heap of history," as Ronald Reagan predicted, but it's ideology of egalitarianism is alive and well in both the media

and academia, which currently have a strangle-hold on public opinion. Anyone who dares question egalitarianism publicly will face serious consequences.

Recall that the idea of Communism sounded nice--that "everyone will share, and work toward the common good." But behind that facade lurked the most destructive system of government that ever existed. Likewise, egalitarianism sounds nice. It asserts: "All individuals and groups are born exactly equal on every trait that matters." The simple fact is that it's demonstrably false.

Paper Tiger

Egalitarianism and the association of eugenics with the Nazis may seem to have created a hopeless situation, but it's more like a paper tiger. The fact is, no concerted effort has ever been made to overcome it. We can even allow eugenics' unfairly sullied reputation to work for us in the beginning--we do nothing to reinforce it, of course, but if the word "eugenics" generates a lot of controversy, then so be it. The media follow controversy, and eugenics is nothing if not controversial. Talk radio thrives on it. We will get a brief "free ride," and then people will come to realize that we are serious, dedicated people who are concerned with the well-being of future generations. We might consider hiring a publicist and a marketing analyst to help us over the long term.

Eugenics needs to enter the public discourse, and people need to hear the common-sense arguments in favor of it. We should expect that some in the media will try to suppress eugenics' message, or distort it, just as they more generally do not cover (or deliberately slant) facts and events that are at variance with their own liberal, egalitarian views. However, others will cover it fairly, and with the Internet, C-Span, and who-knows-what next, eugenics won't be suppressed for long.

Safety in Numbers

Eugenicists need to join together in an organization, and to speak out publicly in articles, speeches, debates, and every forum possible. (I can say from my own somewhat limited experience that in debates, most anti-eugenicists aren't very formidable opponents, as they tend to be overly-emotional and terribly ill-informed.) Within 2 or 3 years, we should hold an international eugenics conference. A number of eminent scientists favor eugenics (such as Francis Crick, James Watson, Joshua Lederberg, Lee Silver, et al). The conference will be a great accomplishment, in and of itself, and we can publish the proceedings. It ought to be held again every other year. It will also be newsworthy, in light of the many luminaries in attendance--to say nothing of the noisy protesters marching outside!

It's essential to groom several individuals as our media spokespeople. I deliberately use the word "groom" in 2 senses. The first is to prepare for a role, the second is to "spruce up." Like the politicians, we must be media-savvy in order to succeed, so our spokespeople must practice

debating, dealing with unruly audiences, etc., and in addition, we must take all necessary steps to make them as "camera friendly" as humanly possible.

The fact that eugenics is a taboo subject means it's worse than being ignored--it means there's a "built-in" opposition to it on the part of the public before the subject is even broached. By temperament, most people are too timid to become directly involved in such a controversial issue, although some can do it behind the scenes. This leaves only a tiny percentage of the smartest and the bravest people who are even capable of working on it, so those of us who can, should!!

It would be a mistake to conclude that because the taboo against eugenics is unfair and unwarranted, we should simply ignore it, and the psychological dynamic keeping it in place. There are things we can do to eradicate the taboo (described below). It is also pointless to bemoan the blind conformity of the average person, which plays a role in maintaining it. We need to be objective about human nature, and to work with it.

Consider the role of conformity in our evolution. The human species evolved as a social animal, and individuals had a difficult or impossible time trying to survive alone. Those who were too terrified to express strong disagreement with the group would be more likely to survive and pass on their genes in primitive circumstances in which ostracism usually meant death. It's no wonder conformity is a very strong instinct. Therefore, psychologically, it's important for the public to see respectable, articulate people speak out in support of eugenics, and then to see these same individuals again and again over time. Only then they will understand--not only intellectually, but emotionally, on a gut level--that eugenicists are not in danger of being crucified, burned at the stake, or shunned by every living creature. If someone says something in favor of eugenics, and is denounced as a racist or a Nazi, he/she should maintain a "high profile" afterwards, confident and un-cowed, and other members of the organization should immediately hold a press conference to express their support.

"Jimmy the Greek"

Eugenicists can learn a lesson from what happened to "Jimmy the Greek." In response to a question about why blacks seemed to excel at sports, he said something to the effect that perhaps plantation owners had encouraged reproduction of the strongest men so they could get more work done in the fields. He was instantly fired from CBS, and from then to his death was never seen nor heard from again. Most people were hard-pressed to say precisely what was so offensive about his remark. Perhaps he said something derogatory off camera. But the point is, the public gets the message: "Race is a taboo subject. Terrible things happen to those who breach the taboo."

This is precisely the message we want the public to un-learn about eugenics, and we can take simple, practical steps to insure that it does un-learn it. Here is the essential thing, which bears

repeating: We must speak out about eugenics at every opportunity, and we must insure that the public sees that those who do so go on to survive and prosper!! After they've witnessed this a number of times, eugenics will no longer be a taboo subject. It's just that simple. We will have won a major psychological victory.

It will take years of hard work to accomplish this. But if this problem were easily solved, someone would have solved it long ago! In that case, we wouldn't have the honor and privilege of taking on the challenge ourselves! We have before us an exceedingly difficult problem demanding every ounce of our creative intelligence. But it is also the most "worthy" of problems because the happiness and well-being of countless people of the future depend on our efforts.

There's always a multitude of worthwhile causes, but I can't imagine any more important than eugenics, because the health, intelligence, and character of the population are essential to the recognition and solution of all problems. We can never fully anticipate what difficulties the future will bring, and solve them in advance. Would it even be advisable to try? Certainly it would not represent the optimal use of our resources. Far and away the best thing we can do for the children of the future is to bequeath to them the gifts of excellent health, high intelligence, and good character so that they will have the maximum innate capacity to meet whatever challenges might arise.

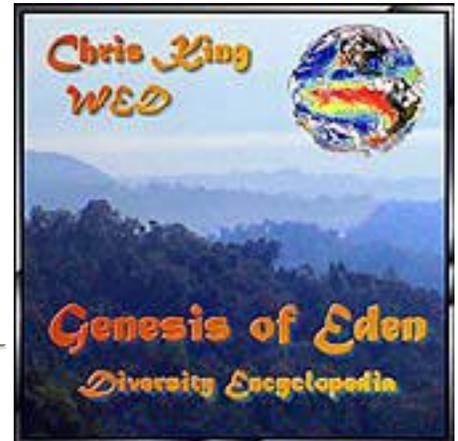
Ask yourself this question: Would you rather be a healthy, smart, honorable person with number of problems to overcome, or chronically ill, retarded, or a psychopath with no other problems? I think everyone--past, present, and future--would make the same choice. Biological integrity is the number one priority for individuals, and for our species.

Marian Van Court

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Chinese Deal Sparks Eugenics Protests New Scientist 16 th Nov 1996 p4

A French genetics company has won a deal that will let it examine the DNA of the entire population of China if it wants, New Scientist magazine reported yesterday. Genset, which specialises in collecting and sequencing human DNA, says it will appoint about 20 researchers to collect and analyse the information. But the magazine said geneticists were worried that China could use the information to enforce its 1995 Maternal and Infantile Health Care Law, denounced by opponents as a "eugenics" law to stop "inferior" births. Many researchers are threatening to boycott the next International Congress of Genetics in Beijing in 1998 unless the law is repealed.

New Scientist said that although the French scientists were interested in new therapies, not eugenics, it was worried that the Chinese Government might try to use the knowledge to identify genetically "unfit couples and fetuses."

"If you have a commercial company coming to a major agreement with a government committed to widespread eugenic abuse it's something many scientists would be concerned about" said

British geneticists meeting last week in London. Genset should secure specific promises that the information gained and released through the deal will not be used against individuals "The company should say some bits of this law are wrong and evil" said David Sjherrat president of the Genetical Society.

Cultural Reaction NS 24 Oct 98 3

PARENTS the world over want perfect babies-though not everyone will agree what "perfect" means. A survey of deaf people (see p 18) has revealed a few who would prefer deaf children. Perhaps they see deafness as part of their identity, or maybe they fear rejection by children who can hear. Whatever their reasons, they would get short shrift in China. According to a recent survey (also p 18), Chinese geneticists favour prenatal tests to back what appear to be eugenic practices. The finding will horrify most of their Western colleagues, and increase the pressure on them to boycott meetings in China. But the survey Also underscores the need for constructive dialogue. And that can only take place if geneticists in the West understand the cultural forces at work. Xin Mao, the survey's author, makes no apologies for the findings. In China, individuals are more willing than in most Western countries to make sacrifices for the general good. China also has a burgeoning population. It's not hard to see why its geneticists might seek to cultivate the view that having an "unhealthy" child is "letting the side down". Who knows whether ordinary Chinese agree with the nation's geneticists? But even if they do, it doesn't change the argument. Eugenics is abhorrent, whether it is directed by force or through active "cultural" compliance. It recalls horrific memories of attempts to create a master race and is the antithesis of human rights as it is known in the Western world.

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Chinese Geneticists' Views of Ethical Issues in Genetic Testing and Screening: Evidence for Eugenics in China

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Summary

To identify Chinese geneticists' views of ethical issues in genetic testing and screening, a national survey was conducted. Of 402 Chinese geneticists asked to participate, 255 (63%) returned by mail anonymous questionnaires. The majority of respondents thought that genetic testing should be offered in the workplace for α -antitrypsin deficiency (95%) and the predisposition of executives to heart disease, cancer, and diabetes (94%); that genetic testing should be included in preemployment physical examinations (86%); that governments should require premarital carrier tests (86%), newborn screening for sickle cell (77%), and Duchenne muscular dystrophy (71%); and that children should be tested for genes for late-onset disorders such as Huntington disease (85%), susceptibility to cancers (85%), familial hypercholesterolemia (84%), alcoholism (69%), and Alzheimer disease (61%). Most believed that partners should know each other's genetic status before marriage (92%), that carriers of the same defective gene should not mate with each other (91%), and that women should have a prenatal diagnosis if medically indicated (91%). The majority said that in China decisions about family planning were shared by the couple (82%). More than half had views that, in China, there were no laws to prohibit disability discrimination (64%), particularly to protect people with adult polycystic kidney disease (57%), cystic fibrosis (56%), or genetic predisposition to other diseases (50%). To some extent,

these results might provide a basis for a discussion of eugenics in China, particularly about China's [Maternal and Infant Health Care Law \(1994\)](#).

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Introduction

Genetic testing and screening are hot topics that stimulate widespread discussion and debate, not only among genetics professionals, but among clinicians and scientists generally, and increasingly these topics involve the wider public in developed countries. Views are expressed in the scientific and general press, and through other media, about the likely benefits and dangers that may result from genetic testing and screening ([Harper and Clarke 1997](#)).

However, there is much less debate about genetic testing and screening in developing countries, where ~95% of the world's future children will be born. To some extent, this situation reflects the lack of genetics services in these countries. A majority (3,330) of the estimated 5,000 specialists in medical genetics worldwide work in developed countries, which have an overall geneticist/population ratio of ~1:222,000, compared with a ratio of ~1:700,000 for eastern European countries and ~1:3,700,000 for developing countries ([Wertz et al. 1995](#)). Clinicians, scientists, and the public in developing countries are focused on the struggle to improve basic health care. Given the problems of poverty, illiteracy, low contraceptive use, and high infant mortality ([Galjaard 1997](#)), they have relatively little interest in the development of genetics research and services.

China, however, is an exception, having to some extent made genetics a priority. For example, in the 1960s cytogenetics technology was introduced to China, and in the 1970s chorionic villi sampling was performed in some hospitals ([Luo 1988](#)). Since the 1980s, molecular-genetic techniques have been used in genetic research and counseling in several national genetic laboratories ([Luo 1988](#); [Fu et al. 1995](#)). In 1988, in vitro fertilization, embryo transfer, and gamete intrafallopian transfer were available in several teaching hospitals ([Zhang et al. 1988](#)). In 1992, the techniques of enrichment of fetal cells from maternal blood, for prenatal diagnosis and sex determination during the first trimester, were introduced to China. In 1994, China launched its Human Genome Project ([Li 1994](#)). Gene therapy for patients with hemophilia

B has also been used in clinical trials ([Fu et al. 1995](#)).

On the other hand, according to international standards, genetics services in China are underdeveloped because of a lack of funding and expertise, as well as the large number of people with genetic conditions ([Harper and Harris 1986](#); [Luo 1988](#)). Chinese geneticists have expressed their views about ethical, legal, and social issues in genetics research and practice in China. Their concerns are, however, quite different from those of other countries, particularly developed nations ([Mao 1996, 1997](#); [Mao and Wertz 1997](#)).

The term "eugenics" has many meanings. Eugenics can be voluntary or coerced, government sponsored or individual, a "science" or a social policy, based on the welfare of individuals or on the welfare of society or a nation ([Paul 1992](#); [Garver and Garver 1994](#); [Larson 1995](#); ["Brave New Now" 1997](#)). Most people in developed countries today think of eugenics as a coercive social program enforced by the state for the good of society. Since China announced the [Maternal and Infant Health Care Law \(1994\)](#), it has provoked widespread concern in the international scientific community, because of some of its eugenic content (["China's Misconception of Eugenics" 1994](#); ["Western Eyes on China's Eugenic Law" 1995](#); [O'Brien 1996](#); ["Brave New Now" 1997](#); [Harper and Clarke 1997](#); [Morton 1998](#)). There has, however, been very little international discussion on what eugenics means for Chinese geneticists and why it is alive and well in China. In this article, I will present Chinese geneticists' views of ethical issues in genetic testing and screening and will discuss the likely basis of eugenics in China, particularly China's [Maternal and Infant Health Care Law \(1994\)](#).

Subject and Methods

An anonymous international questionnaire including 50 questions on ethical issues, which was used in an international study comparing attitudes of geneticists in 37 nations ([Wertz and Fletcher 1993](#)), was distributed to 402 geneticists in 30 provinces and autonomous regions in mainland China. These geneticists were registered members of the Chinese Association of Medical Genetics, the Human and Medical Genetics Branch of the Chinese Society of Genetics, or the Chinese Society of Family Planning, all of which are headed by the Chinese Association for Science and Technology but are affiliated with different departments of state (the Ministry of Public Health, the Chinese Academy of Science, and the National Committee of Family Planning, respectively). In all, 255 geneticists (63%) responded. All of the respondents' comments were translated into English. The completed questionnaires were mailed to the Division of Social Science, Ethics and Law, at the Shriver

Center for Mental Retardation, in the United States, for statistical analysis. Coded data were entered into the SPSSX program (from Statistical Package for the Social Sciences) on an IBM 3090 computer ([Mao and Wertz 1997](#)).

Results

The questionnaire asked whether genetic testing should be offered for job application-related situations; the majority of respondents thought that genetic testing should be offered to workers for α -antitrypsin deficiency in a very dirty workplace (95%) and for executives' predisposition to heart disease, cancer, and diabetes (94%).

The questionnaire listed several ethical issues designed to survey respondents' opinions. The majority of respondents agreed that partners should know each other's genetic status before marriage (92%), that carriers of the same defective gene should not mate with each other (91%), that women should have prenatal diagnosis if it is medically indicated (91%), that genetic testing should be included in preemployment physical examinations (86%), and that governments should require premarital carrier tests (86%) and newborn screening for sickle cell anemia (77%) and for Duchenne muscular dystrophy (DMD) (71%) ([table 1](#)). Sixty-five percent agreed with the statement that "an important goal of newborn screening is to identify and counsel parental carriers before next pregnancy."

Issue	Percentage
Partners should know each other's genetic status before marriage	92%
Carriers of the same defective gene should not mate with each other	91%
Women should have prenatal diagnosis if it is medically indicated	91%
Genetic testing should be included in preemployment physical examinations	86%
Governments should require premarital carrier tests	86%
Newborn screening for sickle cell anemia	77%
Newborn screening for Duchenne muscular dystrophy (DMD)	71%
"an important goal of newborn screening is to identify and counsel parental carriers before next pregnancy."	65%

Table 1 Views on Various Ethical Issues

When Chinese geneticists were asked whether parents should be able to have their children tested for late-onset disorders or predisposition to such diseases, the majority said that, if parents request it, children should be tested for Huntington disease (85%), susceptibility to cancers (85%), familial hypercholesterolemia (FH) (84%), and predisposition to alcoholism (69%) or to Alzheimer disease (AD) (61%) ([table 2](#)).

Disorder	CHILDREN SHOULD BE TESTED*	
	Yes (%)	No (%)
Huntington disease	85	15
Susceptibility to cancer	85	15
FH	84	16
Alcoholism	69	31
AD	61	39

* For genes for either adult onset or predisposition.

Table 2 Views on the Testing of Children for Late-Onset Disorders

When asked whether there was a prevailing pattern for decisions about family planning, most (82%) said that decisions about family planning were shared by the couple. The minority believed it to be determined by the husband's (10%), doctor's (3%), wife's (2%), husband's parents' (2%), or wife's parents' (1%) views ([table 3](#)).

	Agree (%)
Couple should make decision	82
Husband should make decision	10
Doctor should make decision	3
Wife should make decision	2
Husband's parents should make decision	2
Wife's parents should make decision	1

Table 3 Views on Family Decision Making

When asked whether there were any laws prohibiting disability discrimination, more than half of Chinese respondents said that there were no such laws in China (64%), particularly to protect people with adult polycystic kidney disease (57%), cystic fibrosis carriers (56%), and persons with genetic predisposition to other diseases (50%) ([table 4](#)). Ninety-four percent agreed with the statement that "it is not fair for a child to be brought into the world with a serious genetic disorder if the birth could have been prevented;" 79% thought that some disabilities will never be overcome even with maximum social support, and the majority would not support disabled parents' decisions to have disabled children. Ninety percent thought that an ethical code or guidelines for genetics services are needed in China, and 50% said that public education in genetics should be the top priority of the government health budget.

	Country Should Have Law	
	Yes (%)	No (%)
To prohibit disability discrimination	36	64
To protect people with adult polycystic kidney disease	43	57
To protect cystic fibrosis carriers	44	56
To protect people with genetic predisposition to other diseases	50	50

Table 4 Views on Laws Prohibiting Disability Discrimination

Discussion

Genetic testing, which is offered to individuals and families who are at high risk, is either the analysis of a specific gene—and/or its product or function—or other DNA and chromosome analysis, to detect or exclude an alteration likely to be associated with a genetic disorder. Genetic screening is applied to large population groups with unknown excess risk to individuals. Screening is frequently part of government-sponsored public-health programs

and may be a preliminary procedure that identifies people at elevated risk of genetic disease, but it does not provide a definitive diagnosis ([Wertz et al. 1995](#); [Harper and Clarke 1997](#)).

In this survey, questions about newborn genetic screening were asked. This is because newborn screening for phenylketonuria (PKU) and hypothyroidism has saved many thousands of infants worldwide from these two severe disorders and therefore has created a large store of goodwill and ethical credit in favor of genetic screening programs ([Harper and Clarke 1997](#)). This survey shows that 77% of Chinese respondents thought that the government should require newborn screening for sickle cell disease ([table 1](#)). The figure is higher than those for the United Kingdom (13%) and the United States (11%) ([Wertz 1995](#)). One explanation for this difference might be that Chinese geneticists believe that identification of parents and newborns who are heterozygous carriers is important, since sickle cell disease is very common in China. Although newborn screening for DMD fails to meet the established World Health Organization guidelines for the adoption of a screening program ([Wilson and Jungner 1968](#)), it might be helpful to avoid diagnostic delays and to permit families to seek genetic counseling before they embark on another pregnancy. The mothers of infants in the United Kingdom appeared to have more enthusiasm for newborn screening for DMD, since 94% of them would accept such screening ([Smith et al. 1990](#)). When geneticists around the world were asked whether the government should require newborn screening for DMD, 71% of Chinese respondents, 64% of respondents in the United States, and 49% of respondents in the United Kingdom thought that the governments should do so ([table 1](#)) ([Wertz 1995](#)). On this issue, the difference between geneticists in China and the United Kingdom may be that Chinese geneticists believe that newborn screening for DMD is a public-health issue, and that, because it is very expensive in China, it must be government sponsored. Geneticists in the United Kingdom are concerned about the state directing genetic decisions, rather than individuals making the choices ([Harper and Clarke 1997](#)). In addition, the majority of European, North American, and Chinese geneticists would recommend newborn screening for cystic fibrosis, FH, fragile X, and thalassemia if automated DNA diagnostic techniques were available on newborn blood spots, even though there is no proof that the newborn benefit from such screening ([Wertz 1995](#)). It may still be reasonable to offer such screening if the disease has its onset in childhood and if the child's family finds it helpful to have an early diagnosis ([Harper and Clarke 1997](#)).

The advent of DNA-based testing across a wide and increasing range of late-onset genetic disorders is a challenge to conventional thinking about

medical tests. This is because those individuals receiving an abnormal result are sometimes considered, by themselves and others, to "have the disease," even though they are still presymptomatic. Testing children for late-onset genetic disorders may have serious ethical and social implications. This survey shows that most Chinese geneticists thought that children should be tested for susceptibility to cancers and FH ([table 2](#)). Most geneticists in Europe and North America expressed the same view, since they saw early diagnosis and early treatment of these disorders as being a potential benefit to the child ([Wertz 1995](#)). However, most of them thought that testing for Huntington disease, alcoholism, and AD provided no medical benefit to the child ([Wertz 1995](#)). They opposed the testing of children, on the grounds that testing was an affront to the autonomy of the child, who, on reaching adulthood, should be allowed to make his or her own decisions on whether to be tested. Most Chinese geneticists favored such testing ([table 2](#)), on the grounds that parents should be able to decide for their children and should have the power to direct their children's lives. This cultural division reflects the extension of individual autonomy in developed countries, to include preservation of the autonomy of minors. In China, the child is often seen as part of a collectivity (the family), rather than as a potentially autonomous individual.

Although, thus far, employers' requests for employment-related genetic testing have been few ([Harper and Clarke 1997](#)), questions on whether such testing should be offered were included in this survey because there is an ethical conflict between the individual's rights and the employer's interest. More and more Western geneticists have expressed their concerns on the likelihood of misuse of such testing, which would cause harm to those employees with genetic conditions (i.e., genetic discrimination; [Harper and Clarke 1997](#)). This survey shows, however, that most Chinese geneticists agreed that such testing should be offered as a part of a routine physical examination. This result may demonstrate that Chinese geneticists hold strong social views on genetics services ([Mao and Wertz 1997](#)).

One purpose of genetics services is to provide accurate, full, and unbiased information that individuals and families may use in making decisions. Traditionally, China has been a paternalistic society and parents have had absolute power to make family decisions. To explore the current situation of family planning in China, questions on this issue were asked. This survey shows that, of 255 respondents, 51% were female ([Mao and Wertz 1997](#)). Most of them thought that family planning was currently shared by the couple. This figure is quite similar to that in developed countries ([Wertz 1995](#)) and, in part, may reflect socioeconomic changes that have occurred in China during

the past 4 decades.

In 1994, China's population reached 1.2 billion. Now China is pushing on with its goal of ensuring that the country's population is \leq 1.3 billion by the end of the century and $<$ 1.4 billion by 2010. The basic means of reaching the goal are birth control and the "one couple, one child" policy, which stipulates that each Chinese couple is legally allowed to have only one child ([Wu 1994](#)). Ironically, China has paid a huge socioeconomic price for ridiculing the theory and practice of birth control and family planning during the 1950s and 1960s. On the other hand, according to a national sampling survey in 1987, there were 51.64 million disabled people (4.9% of the total population) in China. Of these, 54.3% (i.e., 2.66% of the total population) were children. The majority of these disabilities (64.91%) are due to postnatal diseases and injuries, whereas 35.09% are due to birth defects and genetic diseases ([Chen and Simeonsson 1993](#); [Ming and Jixiang 1993](#)). One aim of this survey is to investigate geneticists' attitudes toward the social and legal aspects of genetics. It would be necessary to ask whether there are laws or regulations in China that prohibit discrimination against people with disabilities. This survey shows that more than half of Chinese respondents thought that there were no such laws or regulations in China, particularly to protect people with genetic conditions. This may be because, although the rights of people with disabilities have been protected constitutionally in China, there are no Chinese laws specifying whether people with genetic conditions should be protected as disabled people. This survey also suggests that most Chinese still regard disabilities as a severe burden for both family and society. Population and disability issues are universal. As the history of the Western eugenics movement has shown, these issues are to some extent likely to produce a social "medium" or environment for the "birth and growth" of eugenics ([Paul 1995](#)).

Historically, cost effectiveness appears to be one of the major issues concerning Western eugenicists. A typical example of this was seen in 1923, when the American Eugenics Society tried to justify the expense of building enough institutions to house and separate all the mentally retarded people by calculating that the \$25,000 (U.S.) spent on segregating the original mentally retarded persons for life would have saved the state $>$ \$2,000,000 in later costs. It also added that sterilizing the original mentally retarded people would have cost $<$ \$150 ([Larson 1995](#)). Although it is questionable whether economic calculations would really work in genetics, some Western geneticists still regard cost effectiveness as an important factor in genetics services. This is because the clinical genetics services already available have been shown to be highly cost effective, mainly because of the high costs of medical and

psychosocial care for the chronically handicapped in Western countries. For example, in the Netherlands seven regional clinical genetics centers involved in pre- and postnatal chromosome analysis, biochemical and DNA diagnosis, and genetic counseling supported by the national health insurers cost ~\$50 million/year. As a result of their combined activities, the birth of 800–1600 severely handicapped children is avoided every year. The costs of their medical and psychosocial care would have been \$500 million–\$1 billion during an average life span of 10 years ([Galjaard 1997](#)). Moreover, it even has been predicted that the most enforced codes of medical practice, particularly in genetics services, may be based on cost-effectiveness analysis rather than on ethical considerations for the future ([Wertz 1997](#)).

The concept of cost effectiveness may have different meanings for Chinese geneticists. This is because, unlike Cuba, where a free health care system including genetic testing and screening covers the entire population ([Heredero 1992](#)), genetics services in China are not free and are expensive for most Chinese people. For instance, in 1987 the average income of a Chinese worker in a factory or university was ~\$30/mo, whereas the cost of cytogenetic testing was \$6–\$20. On the basis of the population prevalence of chromosomal diseases in Sichuan province (31.5/100,000) ([Zhang et al. 1991](#)), it is estimated that there would be 346,500 persons with chromosomal disorders in China at that time (in an overall population 1.1 billion). If all of these cases were diagnosed cytogenetically, it would cost \$2,000,000–\$7,000,000, which is equivalent to 69,300–231,000 workers' monthly incomes. The costs of genetics services have increased very rapidly in recent years because of inflation and health-care reform, although such services in China are still underdeveloped and fall far short of the needs of people with genetic disorders.

The prevalence of PKU in the Chinese population is ~6/100,000 people ([Liu and Zuo 1986](#)). Thus, there would have been ~72,000 people with PKU in 1994, when the population was 1.2 billion. A Chinese study analyzed the cost benefit of newborn screening for PKU and estimated that the 10-year cost of screening, diagnosis, medical care, and dietary therapy for each PKU case identified would be \$4,000. If PKU infants were not diagnosed and treated, the estimated cost of living for one untreated, mentally retarded individual with a mean life span of 40 years also would be \$4,000. Income loss, special education costs, and inability to contribute to society would cause a total loss of ~\$20,000. The long-term estimated benefits due to early screening, diagnosis, and treatment, minus the cost of screening and treatment, therefore is ~\$20,000. Thus, the ratio of benefit:cost ratio would be ~5:1 ([Zhou 1995](#)). It is a pity, however, that China is still unable to produce a low-phenylalanine

diet in quantities large enough to provide adequate therapy for most affected babies ([Luo 1988](#)), even though the PKU test is cheap and newborn screening for PKU seems to be cost effective in China. All of these actual situations most likely will lead Chinese thinking to consider the use of other radical means, such as abortion and sterilization, to reduce the incidence of PKU ([Mao and Wertz 1997](#)).

The word "eugenics," which currently is used more widely in China than in the West, when directly translated into Chinese, is "yousheng" and "youyu," which mean "well bear" and "well rear." The view most widely held by Chinese geneticists is that eugenics implies processes designed to ensure that children who are born are, as far as possible, "normal." How to achieve this, in the context of strict family limitation, has emerged as the most significant difference, in the approach to medical genetics, between China and the West ([Harper and Harris 1986](#)). This survey was conducted in 1993, 1 year before China promulgated the [Maternal and Infant Health Care Law \(1994\)](#). In their comments, almost all respondents said that the goal of human genetics was "improvement of the population quality, decrease of the population quantity, and furtherance of eugenic principles" and agreed that "an important goal of genetic counseling is to reduce the number of deleterious genes in the population" ([Mao 1997, p. 20](#)). Chinese geneticists also were extremely pessimistic about directive counseling after prenatal diagnosis for almost all genetic disorders ([Mao and Wertz 1997](#)). The majority of them would advise voluntary surgical sterilization for a single blind woman on welfare who had a 50% risk of blindness in children (88%), for a woman with fragile X who was living in an institutional setting (73%), and for a cystic fibrosis carrier-carrier couple (52%) ([Mao and Wertz 1997](#)). This survey reveals that most Chinese geneticists thought that partners should know their genetic status before marriage, that carriers of the same defective gene should not marry each other, and that women should have prenatal diagnosis if medically indicated. These views were expressed, to some extent, in the Chinese [Maternal and Infant Health Care Law \(1994\)](#).

The contentious articles of the law are cited as follows ([Maternal and Infant Health Care Law 1994](#)):

Article 8.—The premarital physical checkup shall include the examination of the following diseases:

1. Genetic diseases of a serious nature;
2. Target infectious diseases;

3. Relevant mental disease.

Article 10.—Physicians shall, after performing the premarital physical checkup, explain and give medical advice to both the male and the female who have been diagnosed with a certain genetic disease of a serious nature that is considered to be inappropriate for childbearing from a medical point of view; the two may be married only if both sides agree to take long-term contraceptive measures or to get the ligation operation for sterility. However, a marriage that is forbidden as stipulated by provisions of the Marriage Law of the People's Republic of China is not included herein.

Article 16.—If a physician detects or suspects that a married couple in their childbearing age suffers from genetic disease of a serious nature, the physician shall give medical advice to the couple, and the couple in their childbearing age shall take measures in accordance with physician's medical advice.

Article 18.—The physician shall explain to the married couple and give them medical advice about termination of pregnancy if one of the following cases is detected in the prenatal diagnosis:

1. The fetus is suffering from genetic disease of a serious nature;
2. The fetus has a defect of a serious nature;
3. Continued pregnancy may threaten the life and safety of the pregnant woman or seriously impair her health because of the serious disease she suffers from.

In these articles, "genetic diseases of a serious nature" refers to diseases that are caused congenitally by genetic factors, that may totally or partially deprive the victim of the ability to live independently, that are highly possible to recur in generations to come, and that are considered medically inappropriate for reproduction; "relevant mental diseases" refers to schizophrenia, manic-depressive psychosis, and other mental diseases of a serious nature.

The international opinions on the Chinese law vary. Some Western geneticists have fiercely criticized the law as an "abuse of genetics" and a "violation of human rights" ([Morton 1998](#)). Others have said that "in a country where millions of female children vanish, and many children with developmental abnormalities are left to die, the law might represent an

improvement" ([Beardsley 1997](#), pp. 33–34). Frankly speaking, in China too there is opposition to the law, from some geneticists who did their training in Western countries. For example, they oppose some radical measures such as "sterilization of people with IQ less than 60" and the use of term "eugenics" in the early draft of the law. Interestingly, voices of Chinese geneticists are heard defending the law. Some examples are "China now has a population of 50 million handicapped. Without effective action, China will have an even larger population with serious hereditary diseases and it will naturally impose a grave social problem as regards their livelihood, social and cultural development as a whole and even the quality of the whole population" ("[Opportunity for Depth in Chinese Eugenics Debate](#)" 1998, p. 109); "the law was terribly misinterpreted"; "the law was needed to supplement the one-child policy and had no intention of enforcing eugenic aspects" ([Takebe 1997](#), p. 89); "the law only facilitates practices common for decades in Western countries, and there is no similarity between what is practiced in China and Hitler's concept of eugenics" ([Maddox and Swinbanks 1995](#), p. 549). The survey results do, however, suggest that social, economic, and cultural differences most likely will give rise to a disagreement between China and the West, on the issue of eugenics.

Public education in genetics is thought to be an effective approach to reduce the incidence of genetic diseases, although it needs a huge and long-term investment from the government ([Harper and Clarke 1997](#)). This survey suggests that at least half of Chinese geneticists appear to realize the importance of the issue. On the other hand, genetics education in China has not covered any ethical issues yet ([McCaffrey 1989](#)). One ethicist who advised the drafting of the Chinese law admitted that bioethics has just started to be discussed and was not considered seriously when the law was drafted ([Takebe 1997](#)). This survey, however, reveals that most Chinese geneticists think that ethical guidelines are necessary for the improvement of genetics services in China. Although the Ministry of Public Health of China published a brief ethical code for medical professionals in 1988 ([Qiu 1993](#)), at the moment there are not any ethical guidelines for genetics services in China. A group of experts from both developed and developing countries, including China, sponsored by the World Health Organization, has drafted international guidelines on ethical issues in medical genetics and on the provision of genetics services. The guidelines not only provide ethical principles for genetics services and research but also emphasize respect for cultural, social, and religious diversity ([World Health Organization 1998](#)). It therefore is expected that the guidelines will be introduced into China and will serve as a framework for Chinese geneticists in their practice and research. Perhaps in this practical way, such guidelines could bridge the social and cultural gap

between Chinese geneticists and their Western counterparts, could help to clarify the nature of eugenics, and could allow a consensus on the ethical, legal, and social issues of genetics in the future.

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Chapter 5 of Separation and its Discontents: "National Socialism as an Anti-Jewish Group Evolutionary Strategy"

by Professor Kevin MacDonald

(Praeger Press 1998)

The National Socialist movement in Germany from 1933-1945 is a departure from Western tendencies toward universalism and muted individualism in the direction of racial nationalism and cohesive collectivism. The evidence reviewed below indicates that National Socialism developed in the context of group conflict between Jews and gentiles, and I propose that it may be usefully conceptualized as a group evolutionary strategy that was characterized by several key features that mirrored Judaism as a group evolutionary strategy.

Most basically, National Socialism aimed at developing a cohesive group. There was an emphasis on the inculcation of selfless behavior and within-group altruism combined with outgroup hostility (MacDonald 1988a, 298-300). These anti-individualist tendencies can be seen in the Hitler Youth movement (Koch 1976; Rempel 1989). After 1936, membership was compulsory for children after their tenth birthday. A primary emphasis was to mold children to accept a group strategy of within-group altruism combined with hostility and aggression toward outgroups, particularly Jews. Children were taught an ideology of nationalism, the organic unity of the state, blind faith in Hitler, and anti-Semitism. Physical courage, fighting skills, and a warlike mentality were encouraged, but the most important aspect of education was group loyalty: "Faithfulness and loyalty irrespective of the consequences were an article of faith shared among wide sections of Germany's youth" (Koch 1976, 119).

Socialization for group competition was strongly stressed, "all the emphasis centering on obedience, duty to the group, and helping within the group" (Koch 1976, 128). The ideology of National Socialism viewed the entire society (excluding the Jews) as a large kinship group--a "Volksgemeinschaft transcending class and creed" (Rempel 1989, 5). A constant refrain of the literature of the Hitler Youth was the idea of the individual sacrificing himself for the leader: "the basic idea is that of a group of heroes inseparably tied to one another by an oath of faithfulness who, surrounded by physically and numerically superior foes, stand their ground. . . . Either the band of heroes is reduced to the last man, who is the leader himself defending the corpses of his followers--the grand finale of the Nibelungenlied-- or through its unparalleled heroism brings about some favourable change in its fortune. (Koch 1976, 143)"

The Hitler Youth was associated with the SS (Schutzstaffel, "protection echelon")--an elite corps of highly committed and zealous soldiers. Rempel (1989, 256) estimates that 95 percent of

German youth maintained their fidelity to the war effort even after the defeat at Stalingrad. Koch (1976) describes high levels of selfless behavior among Germans during the war both as soldiers and as support personnel in the war effort, and quotes from individual youth clearly indicate that the indoctrination of young people with National Socialist ideology was quite successful and often appears to have been causally responsible for self-sacrificing behavior.

Within-group egalitarianism is often an important facilitator of a group evolutionary strategy, because it cements the allegiance of lower-status individuals (see below and PTSDA, Ch. 1). While the National Socialist movement retained traditional hierarchical Western social structure, the internal cohesiveness and altruism characteristic of National Socialism may have been facilitated by a significant degree of egalitarianism. There were real attempts to increase the status and economic prospects of farmers in the Hitler Youth Land Service, and class divisions and social barriers were broken down within the Hitler Youth movement to some extent, with the result that lower and working-class children were able to move into positions of leadership. Moreover, the socialist element of National Socialism was more than merely a deceptive front (Pipes 1993, 260, 276-277). The economy was intensively regulated, and private property was subject to expropriation in order to achieve the goals of the community.

Here it is of interest that an important element of the National Socialist ideology and behavior as a group strategy involved discrimination against Jews as a group. Jewish group membership was defined by biological descent (see Dawidowicz 1976, 38ff). As in the case of the *limpieza* phenomenon of the Inquisition, this biological classification of Jews occurred in a context in which many of even the most overtly assimilated Jews--those who had officially converted to Christianity--continued Jewish associational and marriage patterns and had in effect become crypto-Jews (see below and Chapter 6). Thus, an act of September 1933 prohibited farmers from inheriting land if there was any trace of Jewish ancestry going back to 1800, and the act of April 11, 1933, dismissing Jews from the civil service applied to any individual with at least one Jewish grandparent. National Socialist extremists advocated the dissolution of mixed marriages and Jewish sterilization, and wanted to consider even individuals with one-eighth Jewish ancestry as full Jews.¹

From the present perspective, Germany after 1933 was characterized by the presence of two antithetical group strategies. Jews were systematically driven from the German economy in gradual stages between 1933 and 1939. For example, shortly after the National Socialists assumed power, there were restrictions on employment in the civil service, the professions, schools and universities, and trade and professional associations--precisely the areas of the economy in which Jews were disproportionately represented--and there is evidence for widespread public support for these laws (Friedlander 1997; Krausnick 1968, 27ff). Quotas were established for attendance at universities and public schools. An act of September 1933 excluded Jews from faculties in the arts, literature, theater, and film. Eventually Jewish property was expropriated and taxed exorbitantly, and Jews were subjected to a variety of indignities ("No indignity seemed too trivial to legislate" [Gordon 1984, 125]), including prohibitions against

owning pets.

As has happened so often in periods of relatively intense anti-Semitism, barriers were raised between the groups. Jews were required to wear identifying badges and were prohibited from restaurants and public parks. The Nuremberg Laws of 1935 prevented marriage and all sexual contact between the groups. The laws prohibited Jews from employing German women under the age of forty-five as domestic servants--presumably an attempt to prevent Jewish men in a superior position from having sexual contact with fertile gentile women. The National Socialist authorities were also very concerned about socializing and friendship between Jews and gentiles (Gordon 1984, 179; Krausnick 1968, 31)--a phenomenon that recalls the ancient Jewish wine taboo, intended to prevent Jews from socializing with gentiles.

Just as social controls on group members have been important to the Jewish group evolutionary strategy, especially in traditional societies, the National Socialist group strategy punished individuals who violated the various race laws enacted by the Third Reich, failed to cooperate in boycotts against Jewish businesses, or socialized with Jews. For example, there were approximately four hundred criminal cases per year for "race defilement" (i.e., sexual contact between Jews and gentiles) under the Nuremberg Laws. As in the case of Jewish social controls designed to ensure within-group conformity to group interests (see PTSDA, Chs. 4, 6), the National Socialists penalized not only the individual but the family as well: "Any decision to violate Nazi racial regulations, whether premeditated or impulsive, placed a stigma upon oneself and one's family. Arrest or loss of Nazi party membership, for example, frequently meant loss of one's job, retaliation against one's spouse or children, and social exclusion (often compulsory)" (Gordon 1984, 302).

GERMAN ANTI-SEMITIC IDEOLOGIES AS IDEOLOGIES OF GROUP COMPETITION

"Let us not forget whence we spring. No more talk of 'German,' or of 'Portuguese' Jews. Though scattered over the earth we are nevertheless a single people"-Rabbi Salomon Lipmann-Cerfberr in the opening speech delivered on July 26, 1806, at the meeting preparatory to the Sanhedrin of 1807, convened by Napoleon. (Epigraph from Houston Stewart Chamberlain's [1899, I, 329] Foundations of the Nineteenth Century at the beginning of the chapter entitled "The Entrance of the Jews into the History of the West")

While popular German anti-Semitism appears to have been largely autonomous and based on real conflicts of interest rather than the result of the manipulation by an exploitative or demagogic elite (Hagen 1996; Harris 1994, 225- 227; Pulzer 1988, xviii, 321),² the intense anti-Semitism characteristic of the NSDAP (National Socialist German Workers' Party) leadership was not shared by the majority of the population (see Field 1981, 457; Friedlander 1997, 4)³. If indeed German anti-Semitism was to a considerable extent a "top-down" phenomenon in which the NSDAP and government played an indispensable leadership role, it becomes crucial to probe the beliefs of these National Socialist leaders, and in particular of Hitler himself, for whom anti-

Semitism was at the very center of his world view (Dawidowicz 1975; Ffledlander 1997, 102; Gordon 1984, 312; Johnson 1988, 489). The point here will be that Hitler viewed both Judaism and National Socialism as group evolutionary strategies.

However, the perception of group conflict between Jews and gentiles as a central feature of German society long predates Hitler. The literature on 19th-century German anti-Semitism indicates a perception among gentiles that Jews and gentiles were engaged in group conflict. There are also detailed proposals for gentile group strategies in opposition to Judaism. German anti-Semitism in the course of the 19th century shifted from demands for Jewish assimilation by intellectuals such as Kant and the young Hegelians in the early part of the century, to an increasing emphasis on the ethnic divide separating Germans and Jews (Wistrich 1990, 35ff). Throughout this period the consistent belief of German liberals combating anti-Semitism was that Judaism would eventually disappear as a result of assimilation and that emancipation would "hasten the trip to the baptismal font" and result in national unity (Schorsch 1972, 99).

The predominant attitude among German intellectuals at the beginning of the century was that granting Jews civil rights was contingent on complete Jewish assimilation. Jews would cooperate in becoming completely assimilated in exchange for their political and economic emancipation. In the minds of their early 19th-century critics, Jews constituted a nation--an atypical nation to be sure, since it was not confined to a particular territory and its criterion of citizenship was birth by a Jewish mother. But it was a nation nonetheless, and such a conceptualization was entirely congruent with Jewish self-conceptions at least since the Middle Ages and widespread among Zionists later in the century (Katz 1979, 48). Jews would have to give up this condition in order to be Germans.

In the event, however, many Germans believed that Jews had not lived up to their end of the bargain, and eventually it became common among anti-Semites to believe that Jews were "by nature incapable of honoring the contract, of becoming good Germans" (Levy 1975, 22). For example, the anti-Semite Paul Forster stated that "emancipation in the true sense of the word means full assimilation into the foreign body politic. Have the Jews really done this? Have they changed from Jews into Germans?" (in Levy 1975, 22).

On the other hand, for Jews the main concern was the continued existence of Jewish identity (Schorsch 1972, 100). Concerns about the continuation of Jewish identity became more common later in the century. As Katz (1985) notes, the 19th century began with the official blessing of the Jewish assimilationists at the Parisian Sanhedrin convened by Napoleon in 1807 and ended with the first Zionist Congress in Zurich in 1897.

Assimilation did not occur at any level of the Jewish community, including the movement of Reform Judaism, and it was never intended by any significant segment of the Jewish community (PTSDA, Ch. 4).

"The predicament of emancipated Jewry, and ultimately the cause of its tragic end, was rooted not in one or another ideology but in the fact that Jewish Emancipation had been tacitly tied to an illusory expectation-the disappearance of the Jewish community of its own volition. When this failed to happen, and the Jews, despite Emancipation and acculturation, continued to be conspicuously evident, a certain uneasiness, not to say a sense of outright scandal, was experienced by Gentiles. . . If gaining civil rights meant an enormous improvement in Jewish prospects, at the same time it carried with it a precariously ill-defined status which was bound to elicit antagonism from the Gentile world. (Katz 1983, 43)"

In addition to a very visible group of Orthodox immigrants from Eastern Europe, Reform Jews generally opposed intermarriage, and secular Jews developed a wide range of institutions that effectively cut them off from socializing with gentiles. "What secular Jews remained attached to was not easy to define, but neither, for the Jews involved, was it easy to let go of: there were family ties, economic interests, and perhaps above all sentiments and habits of mind which could not be measured and could not be eradicated" (Katz 1996, 33). Moreover, a substantial minority of German Jews, especially in rural areas and in certain geographical regions (especially Bavaria) remained Orthodox well into the 20th century (Lowenstein 1992, 18). Vestiges of traditional separatist practices, such as Yiddish words, continued throughout this period.

Intermarriage between Jews and Germans was negligible in the 19th century. Even though intermarriage increased later, these individuals and their children "almost always" were lost to the Jewish community (Katz 1985, 86; see also Levenson 1989, 321n). "Opposition to intermarriage did constitute the bottom line of Jewish assimilation" (G. Mosse 1985, 9). These patterns of endogamy and within-group association constituted the most obvious signs of continued Jewish group separatism in German society for the entire period prior to the rise of National Socialism. Levenson (1989, 321) notes that Jewish defenses of endogamy during this period "invariably appeared to hostile non-Jews as being misanthropic and ungrateful," another indication that Jewish endogamy was an important ingredient of the anti-Semitism of the period.⁴

Moreover, Jewish converts would typically marry other Jewish converts and continue to live among and associate with Jews (Levenson 1989, 321n), in effect behaving as crypto-Jews. The importance of genealogy rather than surface religion can also be seen in that, while baptized Jews of the haute bourgeoisie were viewed as acceptable marriage partners by the Jewish haute bourgeoisie, gentiles of the haute bourgeoisie were not (Mosse 1989, 335). These patterns may well have fed into the perception among Germans that even overt signs of assimilation were little more than window dressing masking a strong sense of Jewish ethnic identity and a desire for endogamy. Indeed, the general pattern was that complete loss of Jewishness was confined to females from a "handful" of families who had married into the gentile aristocracy (Mosse 1989, 181).

Although there were ups and downs in the intensity of anti-Semitism, the general trend over the

course of the 19th and early 20th centuries was that calls for assimilation were increasingly replaced by calls for cohesive, collectivist gentile groups that would enable Germans to compete with Jews and even exclude them entirely from German economic and social life. Reflecting social identity processes, anti-Semitic beliefs became increasingly important as a means of self-identification among Germans: "Professing anti-Semitism became a sign of cultural identity, of one's belonging to a specific cultural camp. It was a way of communicating an acceptance of a particular set of ideas, and a preference for specific social, political, and moral norms. Contemporaries living and acting in Imperial Germany learned to decode the message. It became part of their language, a familiar and convenient symbol. (Volkov 1978, 34-35)"

Anti-Semitic rhetoric increasingly emphasized the desirability of a unified German political entity that was above political and religious differences and which would exclude Jews. This is essentially a prescription for a specifically German group strategy in opposition to Judaism, that is, the development of "a united front against the alleged domination of an 'alien race'" (Wistrich 1990, 38). As Dawidowicz (1975, 47) notes (derisively), "The Germans were in search of a mysterious wholeness that would restore them to primeval happiness." Commenting on attitudes in the period 1900-1914, Field (1981, 313) describes pervasive complaints of a lack of "shared ideals" and dissatisfaction with an intellectual life that was "chaotic, spinning off in all directions at once and lacking a common ideological focus." Even German liberals who actively opposed anti-Semitism desired a society centered around the Christian religion: "Though they repudiated the Conservative's notion of the Christian state and fought for a separation of church and state, they had every intention of strengthening the exclusively Christian character of Germany" (Schorsch 1972, 100).

The influential anti-Semitic historian and political activist Heinrich von Treitschke viewed Germany's self-conception as a Christian civilization as a critical component of his overarching goal of producing a politically and culturally unified Germany. Treitschke stated that although many Germans had ceased being active Christians, "the time will come, and is perhaps not so far off, when necessity will teach us once more to pray.... The German Jewish Question will not come to rest . . . before our Hebrew fellow-citizens have become convinced, by our attitude, that we are a Christian people and want to remain one" (in Pulzer 1988, 242). Unity was perceived as necessary for a militarily strong Germany able to compete as a world power with other Western powers--clearly a conception that Germany must develop a cohesive group strategy vis-a-vis other societies. Treitschke therefore strongly opposed what he perceived as "alien" Jewish cultural influence on German life, because of Jewish tendencies to mock and belittle German nationalistic aspirations.

Christianity as a unifying force was also central to another important late 19th-century anti-Semitic leader, Adolf Stoecker: "I found Berlin in the hands of Progressives--who were hostile to the Church--and the Social Democrats--who were hostile to God; Judaism ruled in both parties. The Reich's capital city was in danger of being de-Christianized and de-Germanized. Christianity was dead as a public force; with it went loyalty to the King and love of the

Fatherland. It seemed as if the great war had been fought so that Judaism could rule in Berlin. . . . It was like the end of the world. Unrighteousness had won the upper hand, love had turned cold. (In Telman 1995, 97)"

National unification was a component of the "Volkische" intellectual tradition. Rather than accepting the pan-national, universalist ideology that characterized the Christian Middle Ages, the Volkische ideal of social cohesion was often combined with nationalistic versions of a peculiarly Germanic form of Christianity, as in the writings of Treitschke, Paul de LaGarde, and Houston Stewart Chamberlain. Thus for Chamberlain, "Christianity was an indispensable cohesive force in a class-torn nation; religious rebirth alone . . . could renew the spiritual basis of society, reaffirming the principles of monarchy, social hierarchy, loyalty, discipline, and race.... [R]eligion, not politics, was the basis of a new Germany" (Field 1981, 302).

This tradition idealized the Middle Ages as a period of Volksgemeinschaft, a sense of social cohesion, organic unity, cooperation, and hierarchical harmony among all social classes. This tradition can be traced to Johann Gottfried Herder (1744-1803; see Herder 1774, 189ff), and it attracted the majority of German intellectuals during the period spanning the 19th century to the rise of National Socialism (Mosse 1970, 8). This tradition is exemplified by Richard Wagner's comment that "the particular atmosphere which my Lohen grin should produce is that here we see before us an ancient German kingdom in its finest, most ideal aspect... Here there is no despotic pomp with its bodyguards pushing back the people to make way for the high nobility. Simple boys make up the escort for the young woman, and to them everyone yields gladly and quite voluntarily" (in Rose 1992, 28; italics in text).

While Volkische ideology could easily be fused with racialist or exclusionary thinking regarding minority groups within the society, there was only gradual development in this direction, and it was not until the end of the 19th century that such linkages became common among anti-Semites. The gradual shift in Volkische ideology from an ideology of assimilation of the entire society into a cohesive group to an ideology of racism and exclusion thus paralleled the general shift from assimilationism toward separatism as a solution to the Jewish question. However, even during the Weimar period some Volkische thinkers--by then a distinct minority--advocated the complete assimilation of Jews within German society.

This ideal of "hierarchic harmony" and group cohesion apparent among these intellectuals therefore did not originate as an aspect of group conflict between Germans and Jews but predated the escalation of this conflict in the late 19th century.⁵ In *The Culture of Critique* I suggest that the ideals of hierarchic harmony and muted individualism are primitive features of prototypical Western social organization.⁶ This Western ideal of hierarchic harmony can be and often has been a powerful force favoring assimilation, and intellectuals advocating hierarchic harmony could also be advocates of Jewish assimilation. For example, Treitschke proposed that Jews become completely assimilated to Germany and that Germany itself be organized as a harmonious hierarchy led by an aristocratic elite (Dorpalen 1967, 242-243). Nevertheless,

Volkisch ideology can easily be transformed into an ideology of intergroup conflict in the event that parts of the society remain unassimilable.

It is noteworthy that German anti-Semitism in no way depended at any time on racial theory (Katz 1983, 41-42). For example, the National Socialists regarded Paul de LaGarde as an important forerunner despite the complete absence of race in his theorizing. Moreover, the National Socialists' opposition to Jews went well beyond their denigration of other races and their attempts to dominate other racial groups. They focused on the same alleged Jewish traits ("moral insensitivity, acquisitiveness, xenophobia, and the like") that had been characteristic of anti-Semitic attitudes since the beginnings of the diaspora, the only difference being that the traits were now attributed to racial differences. "It could therefore be argued that the notion of race, far from being the source of anti-Semitism, only acquired its force as a political weapon through contact with an already existing anti-Semitic tradition" (Katz 1983, 42-43).

In the event, Jews remained as an unassimilated outgroup, and certain real differences between Jews and gentiles developed into a variety of negative stereotypes expected on the basis of social identity theory. Indeed, anti-Semitism based on these issues was a broad regional phenomenon, occurring throughout much of Eastern Europe, Austria, and France (Friedlander 1997; Hagen 1996). Jews not only continued as an ethnically unassimilated group but were, "in their majority, not carried away by the 'hurrah patriotism' of the exuberant nationalists. They inclined, their devotion to Germany notwithstanding, to humanism, reasonableness, moderation, and a measure of internationalism, influenced also by the fact of Jewish dispersion across national frontiers" (Mosse 1989, 43-44). Jews were thus less enthusiastic about creating a highly cohesive, unitary German society than were gentile Germans, and this general tendency among Jews would, in the minds of gentiles, be exacerbated by such salient examples as Jewish-owned publishing companies that were opposed to German nationalism. The disproportionate, high-profile involvement of Jews in leftist, anti-nationalist revolutionary movements in Germany, Hungary, the Soviet Union, and Poland (e.g., Friedlander 1997, 91-93) would also feed into these stereotypes. The presence of an increasingly prominent movement of Jewish nationalism (i.e., Zionism) would have similar effects, as would the presence of a significant number of foreign-looking Jewish immigrants from Eastern Europe. On the basis of social identity theory, given the salience of Jewish-gentile group membership during this period these real group differences would become exaggerated. Gentile Germans would come to define their ingroup as patriotic and loyal, while Jews would be stereotyped as the opposite.

Also tending to exacerbate these social identity processes was the heightened level of resource competition between Germans and Jews as Jewish upward mobility, especially in the period after 1870, resulted in very large Jewish overrepresentation in all of the markers of economic and professional success as well as in the production of culture, the latter viewed as a highly deleterious influence (see Chapter 2; PTSDA, Ch. 5). Indeed, an important component of anti-Semitism in the late 19th century appears to have been the desire of many Germans to participate in a cohesive group in order to compete with Jews economically and socially

(Massing 1949, 79). Interestingly, the powerful cohesion of the Jews was viewed as their "most sinister" attribute (Massing 1949, 79; see also Pulzer 1979, 78), a comment that suggests that anti-Semitism was partly a reaction to the perception that the Jews constituted a highly cohesive group--"a political, social and business alliance for the purpose of exploiting and subjugating the non-Jewish peoples" (from a 19th-century anti-Semitic publication; in Massing [1949, 79]).

Many anti-Semitic leaders envisaged uniting the German people in an effective group strategy against the Jews. For example, the Catholic newspaper *Gerinania* combined advocacy of economic cooperation among gentiles and gentile credit institutions with admonitions against buying or borrowing from Jews. Theodor Fritsch's "Ten German Commandments of Lawful Self-Defense" (reprinted in Massing 1949, 306) combined exhortations to ethnic pride and within-group cooperation with a program of economic and social boycott of Jews: "Be proud of being a German and strive earnestly and steadily to practice the inherited virtues of our people, courage, faithfulness and veracity." "Thou shalt be helpful to thy fellow German and further him in all matters not counter to the German conscience, the more so if he be pressed by the Jew." (in Massing 1949, 306-307)⁷

Massing provides several other examples of anti-Semitic programs calling for German group solidarity combined with exclusion of Jews from public life, cessation of all contact with Jews, and boycotts of Jewish economic enterprises. Wilhelm Marr conceptualized Jews as "not a small, weak group, they are a world power! They are much stronger than the Germans" (in Massing 1949, 8).

Marr viewed Jews as having superior powers and as engaging in a war on Germans and their culture in which each person must choose sides between clearly demarcated groups. Similarly, the anti-Semite Otto Glegau advocated organization of politically powerless gentile groups of artisans, small entrepreneurs, and merchants "whose livelihood and status were in jeopardy" (p. 10) and who were most affected by Jewish competition. After citing statistics on the percentages of Jews among employers and among students in institutions of higher education, Adolf Stoecker stated that "Should Israel grow further in this direction, it will completely overcome us. One should not doubt it; on this ground, race stands against race and carries on--not in the sense of hatred but in the sense of competition--a racial struggle" (in Telman 1995, 107). The view that the Jews were a stronger group than the Germans was common among anti-Semites of the period (see Zimmerman 1986, 100).

The perception that Jews themselves were greatly concerned with racial purity was recognized as early as the 1840s by Jews attempting to combat anti-Semitism (Schorsch 1972, 8). The racial anti-Semites of the post-1880 period were greatly concerned with racial purity. Fritsch's third commandment was "Thou must keep thy blood pure. Consider it a crime to soil the noble Aryan breed of thy people by mingling it with the Jewish breed. For thou must know that Jewish blood is everlasting, putting the Jewish stamp on body and soul unto the farthest generations." Similarly, Wilhelm Marr's *Der Judenspiegel* (published in 1862) conceptualized Judaism as a

racially pure group. Marr emphasized the racial gulf between Germans and Jews and advocated intermarriage as a way of assimilating Germans and Jews (Zimmerman 1986, 47) 8

This concern with group competition and racial purity is also evident among racialist thinkers who based their ideas on evolutionary thinking. There is evidence for the development in Germany during this period of a conceptualization of human evolution as fundamentally involving group rather than individual competition. Some of the most strident anti-Semites in the twenty years prior to World War I were ultra-nationalist groups "preaching a racially-based integral nationalism and a Social Darwinist view of the world" (Pulzer 1988, xx; Gordon 1984, 25-26). From the present perspective, the important point is the idea that the races were in competition with each other and that they should remain separate in order to maintain racial purity.

Houston Stewart Chamberlain is of particular interest in this regard, both because he was a prime influence on Hitler⁹ and because of his interpretation of Judaism as a group evolutionary strategy. Indeed, Chamberlain, and especially his *Foundations of the Nineteenth Century* (1899), was highly influential among German educated classes generally (Field 1981, 225ff). Chamberlain notes that this "alien people has become precisely in the course of the nineteenth century disproportionately important and in many spheres actually dominant constituent of our life" (Chamberlain 1899, I, 330). Clearly Chamberlain believed that Jews and gentiles were in competition in Germany.

Chamberlain exhibits a strong concern with the importance of racial purity, but it is important to note that his exemplar of racial purity is the Jews, and especially the Sephardic Jews. Chamberlain regarded the Jews as having preserved their racial purity over the millennia--a point of view that had been expressed originally by Benjamin Disraeli (see below) and later by the French Count Arthur de Gobineau. His reaction to observing Sephardic Jews is nothing less than ecstatic: "This is nobility in the fullest sense of the word, genuine nobility of race. Beautiful figures, noble heads, dignity in speech and bearing" (I, 273). "The Jews deserve admiration, for they have acted with absolute consistency according to the logic and truth of their own individuality, and never for a moment have they allowed themselves to forget the sacredness of physical laws because of foolish humanitarian day-dreams which they shared only when such a policy was to their advantage" (I, 331).

Chamberlain was thus one of many anti-Semites for whom "the perception that Jews maintained their cohesiveness and sense of identity under all conceivable circumstances was a source of both fear and envy. Indeed, for many anti-Semites this racial perseverance and historical continuity provided a kind of mirror-image model worthy of emulation" (Aschheim 1985, 239). The attitudes of the anti-Semites on racial purity are therefore mirror-images of previously occurring Jewish practices. Evidence in this chapter (see also Chapter 4 and PTSDA, Chs. 2-4) indicates that there is far more than a grain of truth to the idea that the Jews have been concerned to prevent significant influx of gentile genes into the Jewish gene pool.

However, Chamberlain goes beyond this to assert that Jews have gone to great lengths to maintain their own racial purity and at the same time have consciously attempted to enter the gentile gene pool. In support of his argument, Chamberlain states (I, 332-333) that in 1807 the Jewish leaders accepted all of Napoleon's articles aimed at ending Jewish separatism with the exception of complete freedom of intermarriage with Christians; while accepting marriage of daughters with Christians, they rejected the marriage of sons with Christians (a claim I have not been able to verify). He also asserts that the Rothschilds married daughters to the nobility of Europe but had never married a son into it; also, in an earlier section (I, 274) he states that the Sephardic Jews excluded the bastard offspring of Jewish females from the community.

The possibility that an aspect of Judaism as an evolutionary strategy has been to enter the gentile gene pool without admitting gentile genes to their own group is an important empirical proposition, especially given the role of consanguinity [inbreeding] and endogamy [marrying kin] in facilitating group solidarity and altruism among Jews (see PTSDA, Chs. 6, 8). It may well have been the case in traditional societies that intermarriage was mainly accomplished by wealthy Jews providing dowries for their daughters to marry gentiles in the nobility rather than by bringing a gentile woman into the family as the future mother of Jewish children and heirs to the estate. I have noted some evidence for this proposition in the material on Spain and Portugal beginning in the medieval period and extending through at least the 15th century, as well as some indication that this was also a concern in the late Roman Empire (see Chs. 3-4).

It was indeed common for German aristocratic families to restore their fortunes by accepting wealthy Jewish daughters-in-law in the late 19th century (Massing 1949, 106-107). (One publication listed more than a thousand families where Jewish women had been married into the gentile aristocracy [Pulzer 1964, 281]). As Chamberlain asserted, the marriage policy of the Rothschilds was that "boys must choose other Rothschilds, or at least other Jews, for their brides; the girls were sometimes allowed Christian aristocrats" (Morton 1961,98).¹⁰ Moreover, many of the descendants of the 18th-century German court Jews converted to Christianity but continued to marry among themselves, although daughters were commonly married into the gentile nobility (W. E. Mosse 1987, 37). Such behavior by a nominally converted group of Jews (who are in effect crypto-Jews from the standpoint of the evolutionary strategy) is exactly analogous to the marriage practices of wealthy New Christians discussed in Chapter 4.

Traditional Jewish law traces descent through the mother, not the father. Thus the offspring of a Jewish male and a gentile female would not be considered Jews and would be lost to the Jewish gene pool.¹ However, the offspring of a Jewish female married into the gentile nobility might be technically eligible to be Jews, but if their children then married into the gentile gene pool, as would normally be the case, they too would be lost to the Jewish gene pool. "Jewish women. . . who married Gentiles would join Gentile lines and, Talmudic law notwithstanding, would normally produce 'Gentile' offspring. A Jewish woman 'marrying out' would almost invariably abandon her formal Jewish identity" (Mosse 1989, 334).¹¹

This functional interpretation of tracing Jewish descent through the mother can also be seen in Jewish religious writings. Epstein (1942, 166) notes that Ezra's racialist motivation can be seen by his exclusive concern with Israelite men marrying foreign women because the children of unions with Israelite men would be brought up in the Israelite community while those of an Israelite female marrying a foreigner would be lost to the community. Moreover, as indicated by The Code of Maimonides (see PTSDA, Ch. 4), despite the concentration on investigating female relatives to assure family purity, the goal was to maintain the purity of the male line, and especially so in the case of priests. Females could marry men of invalid descent, but men could not. This emphasis on the purity of the male line combined with tracing Jewish descent through the mother would then function in practice as Chamberlain suggests: Jewish stem families could remain "racially pure," while the gene pool of the gentile aristocracy would contain some Jewish admixture.

Although not mentioned by Chamberlain, consanguineous marriages [inbreeding] among highly visible and immensely wealthy Jewish families may also, via social identity processes, have sharpened gentile perceptions of Jews as highly concerned with racial purity. There was a relatively high level of consanguineous marriage among Jews generally (see PTSDA, Ch. 4, 6, 8), and the highly visible Rothschild family practiced consanguineous marriage even more intensively than Jewish families generally during the period, including a highly visible example of uncle-niece marriage and a great many first cousin marriages: "No other family was to practice it [inbreeding] to the same extent as the Rothschilds" (Derek Wilson 1988, 81). Consanguineous marriages¹² continued to be a prominent trend among the Jewish haute bourgeoisie throughout the 19th century and into the 20th (Mosse 1989, 161ff).

Chamberlain (as well as other racialist "Social Darwinist" thinkers-see Krausnick 1968) developed the view that competition between racial groups rather than between individuals was central to human evolution: "The struggle which means destruction of the weak race steels the strong; the same struggle, moreover, by eliminating the weaker elements, tends still further to strengthen the strong" (1899, I, 276). Chamberlain (1899, I, 277) also proposed that the Jews had engaged in artificial selection within their gene pool in order to produce a more competitive group, suggesting that Chamberlain recognized the importance of eugenic practices among Jews.

The emphasis on group competition in these writings is striking. Interestingly, Darwin (1874) himself believed that altruism and the social emotions, such as sympathy and conscientiousness, were restricted to one's own group and were quite compatible with hostility directed toward outsiders, indicating that he had a keen sense of the importance of intergroup competition in human evolution. However, for Darwin this intergroup competition was not necessarily competition between ethnic groups, much less races. Instead, Darwin's perspective appears to be much more compatible with the social identity perspective developed in Chapter 1, that hostility is directed at other groups, whatever their origin, and typically these other groups will be neighboring tribes and therefore of similar racial/ethnic composition.

The belief that competition between groups is an important aspect of human evolution has therefore a long history in evolutionary thought. In the hands of these German racial theorists, this thought was transformed in two fundamental ways. First, the competition was conceptualized as occurring between well defined, genetically segregated racial/ethnic groups; second, the racial/ethnic purity of a group became a critical factor in the success of the group. Both of these points, particularly the latter, are foreign to mainstream Darwinism, and indeed seem to have originated with these thinkers.

One might speculate that these German thinkers emphasized these ideas because intrasocietal group-level resource competition between Jews and gentiles was so salient to them, and in addition because the Jews themselves were highly concerned about racial purity. In the British-American tradition, where this divisive intrasocietal form of ethnically based resource competition and concern with ethnic purity by sub-groups were far less salient, the dominant theoretical tradition ultimately rejected entirely the notion of group selection.¹³

It is interesting in this regard that while in Germany eugenic ideas tended to be bound up with Volkische nationalism and strong currents of anti-individualism (see Gasman 1971), eugenic beliefs in Britain were much less associated with racialist views, were more often held by social radicals with utopian visions,¹⁴ and were more often motivated by individualistic concern that dysgenic practices would result in increasing burdens to society (Kevles 1985, 76, 85). Similarly, while racial science in Germany was deeply concerned with developing ideas on differences between Germans and Jews as distinct races, British race scientists devoted only a "passing and exemplary discussions" to Jews, a phenomenon that "mirrored in some respects the unobtrusive character of Anglo-Jewry as a whole and the somewhat lackadaisical English attitude towards the country's Jewish subjects" (Efron 1994, 45).

Jews did not represent a competitive threat in England during this period. Israel (1985, 242) notes that Jews played a remarkably small role in the economic development of England-- amounting to little more than dominating the diamond and coral trades. They also represented only a minute percentage of the population, 0.01 percent in the nineteenth century (Sorkin 1987, 175). Throughout this period England remained an ethnically homogeneous society, without ethnically-based resource conflict. However, even in England there was anti-Semitism, directed both at the "cousinhood" of wealthy Jewish families and, later in the century, Orthodox immigrants from Eastern Europe (Bermant 1971).

Such a relativist perspective on the nature of scientific theory development is highly compatible with Gould's (1992) perspective on extra-scientific influences on the development of evolutionary theory: He proposes that evolutionary theory is influenced by the beliefs and interests of its practitioners. This, of course, does not imply that these beliefs were not based on reality; in the present case there is in fact evidence that Jews were concerned about racial purity, and also for group-based resource competition between Jews and gentiles.

Chamberlain is viewed as a major influence on Hitler, and indeed it would appear that Hitler's basic beliefs about Jews are almost exact replicas of Chamberlain's. Hitler viewed himself as a unique combination of intellectual and politician--a politician with a *Wehanschauung* (Jackel 1972, 13). Many historians have dismissed the view that Hitler had a consistent ideology, but I agree with Jackel (1972), Gordon (1984), and others that in fact Hitler was extraordinarily consistent in his beliefs and in his behavior in pursuit of those beliefs. Anti-Semitism was "the center of both his personal and his political career" (Jackel 1972, 53); "[T]he Jewish question [was] the central motivating force of his political mission" (p. 53). The centrality of Jewish issues for Hitler is apparent throughout his career up to the very end (see Maser 1974). The sections of *Mein Kampf* relevant to anti-Semitism are entirely straightforward and are consistent with an evolutionary perspective in which group strategies are a central notion.

Hitler believed that races, including the Jews, are in a struggle for world domination, and he had a very great respect for the ability of Jews to carry on their struggle. In *Mein Kampf* (1943) he writes that he sometimes asked himself "whether inscrutable Destiny . . . did not with eternal and immutable resolve, desire the final victory of this little nation" (p. 64); later he characterizes Jews as "the mightiest counterpart to the Aryan" (p. 300).

Hitler had a clear conceptualization of Jews as a strategizing ethnic group in competition with the Germans. Like Chamberlain, Hitler emphasized the ethnic nature of Judaism. In *Mein Kampf* he describes his realization that the Jews were "not Germans of a special religion, but a people in themselves" (p. 56). He makes this point very forcefully at the beginning of his comments on Jews and presents it as the instigating factor in his own anti-Semitism. His negative response when first observing a Jew in Vienna reflects the theme of cultural separatism so central to the long history of anti-Semitic writing: "I suddenly encountered an apparition in a black caftan and black hair locks. Is this a Jew? ... "But the longer I stared at this foreign face, scrutinizing feature for feature, the more my first question assumed a new form: Is this a German?" (p. 56).

His attitude that Jews were an ethnic group and not a religion was confirmed by his discovery that "among them was a great movement. . . which came out sharply in confirmation of the national character of the Jews: this was the Zionists" (p. 56; italics in text). Hitler goes on to remark that although one might suppose that Zionism was characterized by only a subset of Jews and condemned by the great majority, "the so-called liberal Jews did not reject Zionists as non-Jews, but only as Jews with an impractical, perhaps even dangerous, way of publicly avowing their Jewishness. Intrinsicly they remained unalterably of one piece" (p. 57).

These comments by Hitler indicate the reality of the worst fears of the German Reform movement during this period, that continued existence of Jewish cultural separatism characteristic of Orthodox Jews would result in anti-Semitism because Jews would be viewed as aliens (Aschheim 1982; Vollcov 1985; Wertheimer 1987),¹⁶ and that the publicly expressed ethnocentric nationalism of the Zionists would increase anti-Semitism because Jews would be

perceived not as a religious group but as an ethnic/national entity. As Katz (1986, 149) points out, Zionism, international Jewish organizations such as the Alliance Israelite Universelle, and continued Jewish cultural separatism were important sources of German anti-Semitism beginning in the late 19th century.

Further, Hitler, like Chamberlain, believed that Jews were concerned about retaining their own racial purity while consciously attempting to "pollute" that of others: "While he seems to overflow with 'enlightenment,' 'progress,' 'humanity,' etc., he himself practices the severest segregation of his race. To be sure, he sometimes palms off his women on influential Christians, but as a matter of principle he always keeps his male line pure. He poisons the blood of others, but preserves his own. The Jew almost never marries a Christian woman; it is the Christian who marries a Jewess Especially a part of the high nobility degenerates completely. The Jews . . . systematically carries on this mode of "disarming" the intellectual leader class of his racial adversaries. In order to mask his activity and lull his victims, however, he talks more and more of the equality of all men without regard to race and color. The fools begin to believe him. (pp. 3 15-3 16) His ultimate goal is the denationalization, the promiscuous bastardization of other peoples, the lowering of the racial level of the highest peoples as well as the domination of this racial mishmash through the extirpation of the folkish intelligentsia and its replacement by members of its own people. (p. 84)"

Hitler, like Chamberlain, emphasized group-level competition and the importance of racial purity in making the group more competitive. Hitler detailed his beliefs regarding the course of Jewish/gentile resource competition over historical time. Within this struggle, purity of blood was of prime importance. Hitler viewed the Germans as a unique, distinctive and superior ethnic group. There was an emphasis on Germanic prehistory and the inculcation of ethnic pride-- themes that are clearly present in the Volkische literature of 19th-century Germany--as well as the idea of the Volk as a mystical collective entity which bound its members into deep association with each other (see Mosse 1964, 1970). Comparisons between the noble, spiritual, inventive Germans and the parasitic, nomadic, materialistic, unassimilable Jews were common in the Volkische literature.

Interestingly, Hitler believed that the greatest strength of the "Aryan" race was not in its intelligence but in its willingness to sacrifice individual interests to group goals--clearly an indication of his belief that the Aryans constituted an altruistic group and undoubtedly a reflection of the National Socialists' strong emphasis on the inculcation of self-sacrifice and a group orientation in the Hitler Youth. "In [the Aryan] the instinct of self-preservation has reached its noblest form, since he willingly subordinates his own ego to the life of the community and, if the hour demands, even sacrifices it" (p. 297).

**VOLKISCHE IDEOLOGY AND ATTITUDES OF RACIAL SUPERIORITY AMONG
JEWISH INTELLECTUALS IN THE PRE-NATIONAL SOCIALIST PERIOD**

"[The German soul was] determined by the soil and air of this land, determined by the blood and destiny of its people, eternally closed to us. We can grasp it faintly, but our productive stock comes from other provinces, is supplied from different depths, watered from different springs. (Comments of a Zionist during the Weimar period; in Niewyk 1980, 129)"

An important thesis of Chapters 3-5 is that anti-Semitic movements and their enemies come to resemble each other in important ways, so that, for example, in the case of German racial anti-Semitism, a Western anti-Semitic movement developed a strong concern with endogamy, anti-individualism, and racial purity despite general Western tendencies toward exogamy, individualism, and assimilation. In the following, I will explore from this perspective Jewish involvement in Volkische ideologies and attitudes of racial superiority. Like their mirror-image enemies, there is evidence that many Jewish intellectuals in the pre-National Socialist period had a strong racial conceptualization of the Jewish people and believed in the superiority of the Jewish "race."

Such ideologies and attitudes are also important because social identity theory predicts that even a few examples of well-known Jewish theorists who viewed Jews as a superior race would be likely to be very influential in shaping gentile attitudes on how Jews perceived themselves. Given the context of between-group conflict that characterized the period under discussion (roughly 1850 to 1933), gentiles would be likely to suppose that attitudes of Jewish superiority characterized the Jewish community as a whole, either overtly or covertly. It is also easy to see that because of the salience of this type of racist rhetoric, gentiles would attempt to avoid making a Type II error even if in fact the great majority of Jews refrained from an openly stated racialism: If one knows that a prominent subset of Jews conceptualizes Judaism as a race and places a high value on racial purity, and even views Jews as a racially superior group, the best strategy is to assume the worst about most Jews. Gentiles should prevent the error of rejecting the proposition "Jews are an ethnic group and view themselves as an ethnic group, not a religion; they are intent on retaining their racial purity and dominating gentiles by virtue of their superior intellectual abilities," when it could be true. Therefore, a gentile would assume it is true.

These attitudes of gentiles would also be facilitated by the fact that these beliefs were highly compatible with contemporary scientific perspectives on race--the modern arbiter of intellectual respectability. Moreover, we shall see that racist comments occurred throughout the spectrum of Jewish identification, from liberal Reform Jews to Zionists, and that as time went on, there was an increasing rapprochement between liberal Jews and Zionists among whom racist ideas were quite common. This rapprochement may well have contributed to gentiles perceiving Zionist attitudes on Jewish racial separateness and racial superiority as well within the Jewish mainstream. Zionism was highly salient to the National Socialists and other anti-Semites, many of whom agreed with the Zionists' racial interpretations of Judaism and with their desire for Jews to leave Germany and build a community in Palestine. (Niewyk [1980, 142] points out that Zionists did not expect all Jews to go to Palestine but aimed rather at preparing Jews to live as an unassimilated minority in Germany.)

Benjamin Disraeli, although baptized, developed views on the importance of racial purity and the superiority of Jewish heredity, in such works as *Coningsby or the New Generation* (1844), *Tancred, or the New Crusade* (1847), and the non-fictional *Lord George Bentinck: A Political Biography* (1852). As Rather (1990, 141ff; see also Field 1981, 215) points out, Disraeli's views on the importance of racial purity and the role of racial intermixture in the decline of race and culture antedated the writings of Gobineau and were sufficiently well known to have been quoted approvingly by Chamberlain in his *Foundations* (I, 271): "Let Disraeli teach us that the whole significance of Judaism lies in its purity of race, that this alone gives it power and duration." "Disraeli rather than Gobineau--still less Chamberlain--is entitled to be called the father of nineteenth-century racist ideology" (Rather 1990, 146). Disraeli "may have been, both as a writer and even more as a personal symbol, the most influential propagator of the concept of race in the nineteenth century, particularly publicizing the Jews' alleged taste for power, their sense of superiority, their mysteriousness, their clandestine international connections, and their arrogant pride in being a pure race" (Lindemann 1997, 77).

Disraeli noted that Jews have risen quickly to positions of prominence in a wide range of societies despite anti-Semitism. He viewed Jews as a separate race and believed that the key to their superiority was that, unlike the other Caucasian nations, they had retained their racial purity. The inferior races persecute the Jews, but inevitably "the other degraded races wear out and disappear; the Jew remains, as determined, as expert, as persevering, as full of resource and resolution as ever. . . . All which proves, that it is in vain for man to attempt to baffle the inexorable law of nature which has decreed that a superior race shall never be destroyed or absorbed by an inferior" (Disraeli 1852, 490, 495).¹⁸

Disraeli believed that Jews were responsible for virtually all the advances of civilization, including the moral advances of Christianity as well as the accomplishments of prominent businessmen, philosophers, diplomats, and musicians (including Mozart!). Jews were behind the great European intellectual movements: "You never observe a great intellectual movement in Europe in which the Jews do not greatly participate. The first Jesuits were Jews; that mysterious Russian Diplomacy which so alarms Western Europe is organized and principally carried on by Jews; that mighty revolution which is at this moment preparing in Germany . . . is entirely developing under the auspices of Jews, who almost monopolize the professorial chairs of Germany" (Disraeli 1844, 232). The Franks, on the other hand, are a "flat-nosed" group (*Tancred*, 223) descended from a horde of pirates. They are "full of bustle and puffed up with self-conceit (a race spawned perhaps in the morasses of some Northern forest hardly yet cleared)" (*Tancred*, 223).

Heinrich Heine was another baptized Jewish intellectual racist who conceptualized the Jews as a racial/ethnic group that had made great moral and ethical contributions to European culture. Beginning in the 1840s, Heine developed a biological conception of Judaism, as indicated by his using the German word *Stamm* (tribe, with the implication of descent from common ancestors) and *Rasse* (race) to refer to Jews (Praver 1983, 766-767). Moreover, during this period Heine

increasingly stressed the "universal validity of Jewish ethics and the universal message of Jewish Messianism," and he made "repeated assertions that through its absorption of Old Testament ethics and history, modern Europe had become, in a sense, Jewish" (Praver 1983, 765, 769).

Although Disraeli and Heine pioneered views of Jews as an intellectually and morally superior, racially pure ethnic group, Jewish racist thinking was most closely associated with Zionism. Katz (1986b, 149) makes the important point that Jewish nationalism in the post-Emancipation period, including Zionism, was not a reaction to gentile anti-Semitism.¹⁹ Rather, Jewish nationalism provoked anti-Semitism as a gentile reaction--a critical example of the reactive anti-Semitism theme of Chapters 3-5: "Modern anti-Semitism was itself a reaction to Jewish proto-nationalism, to the incapacity and unwillingness of Jewry to divest itself of all the characteristics of national life except that of religion. True, once anti-Semitism--until then a mere undercurrent--erupted as a full-fledged movement in the 1870s and eighties, it gave a tremendous push to Jewish national aspirations. Yet this was already the second phase of a dialectical process. The starting point of the process was not anti-Semitism, but the perseverance of Jewish qualities."

In support of this argument, Katz (1979, 50) notes that in Eastern Europe Jewish nationalism emerged concurrently with the secularization of society and was in no way dependent on the processes of emancipation and cultural assimilation characteristic of the German situation. Eastern European Jewish nationalism, complete with ideological and literary expressions, appeared long before the anti-Semitic pogroms of the 1880s.

Important Jewish intellectuals developed Volkische ideologies as well as racist, exclusivist views, which, like those of their adversaries, were no longer phrased in religious terms but rather in a primitive language of evolutionary biology. These intellectuals had a very clear conception of themselves as racially distinct and as a superior race (intellectually and especially morally), one that had a redemptive mission to the German people and other gentiles. As expected by social identity theory, while the Germans tended to emphasize negative traits of the Jewish outgroup, the Jewish intellectuals often conceptualized their continued separatism in moral and altruistic terms. As indicated in Chapter 7, Jewish self-conceptualizations as a moral and altruistic group with a redemptive mission to gentiles have been the pre-eminent pose of Jewish intellectuals in the post-Enlightenment intellectual world.

The result was that anti-Semites and zealous Jews, including Zionists, often had very similar racist, nationalist views of Judaism toward the end of the 19th century and thereafter (Katz 1986b, 144). Zionism and anti-Semitism were mirror-images: "in the course of their histories up to the present day it has looked as if they might not only be reacting to one another but be capable of evolving identical objectives and even cooperating in their realization" (Katz 1979, 51). Nicosia (1985) provides a long list of German intellectuals and anti-Semitic leaders from the early 19th century through the Weimar period who accepted Zionism as a possible solution to the Jewish question in Germany, including Johann Gottlieb Fichte, Konstantin Frantz, Wilhelm Marr, Adolf Stoecker. All conceptualized Judaism as a nation apart and as a separate

"race."

Efron (1994, 126) notes that the idea of essential racial differences between groups pervaded the cultural landscape of fin de Siecle Europe, and Jews, including especially the Zionist racial scientists, were no exception to this trend.

While the anti-Semites stressed the moral inferiority of Jews, the Jewish racial scientists stressed Jewish contributions to civilization and looked forward to a national rebirth of Jewish culture in a Zionist state.

The influential proto-Zionist Moses Hess (1862) whose major work, *Rome and Jerusalem*, was published in 1862, had well-developed racist ideas about Jews. Although his book was published prior to the intensification of anti-Semitism consequent to complete Jewish emancipation in 1870, it has strong overtones of racial superiority. Hess believed that the different races had enduring psychological and physiological traits, and that the Indo-European traits (embodied by the ancient Greeks) were fundamentally opposed to the Semitic traits (embodied by the ancient Israelites). Like Disraeli and Chamberlain, Hess believed that history is primarily a struggle between races, not social classes, and like these thinkers, Hess (p. 27) believed that a Jew is a Jew "by virtue of his racial origin, even though his ancestors may have become apostates." Judaism in that view, is at its essence the nationalistic aspirations of the Jewish "race," but while other races attempt to gain territory, the role of the Jews is to function as a moral beacon to the rest of humanity. Hess states that Jewish racial characteristics predominate over Indo-Germanic characteristics in intermarriage and that they have survived intact since the sojourn in Egypt (p. 60).²⁰ The racial type comes through even in individuals whose ancestors became apostates (p. 98), and even converted Jews retain interest in Jewish affairs and have strong beliefs in the importance of Jewish nationality (p. 98).

According to Hess, Jews have what Rose (1990, 332) terms a "primal-racial mission" to the rest of humanity:²¹ "It is through Judaism that the history of mankind has become a sacred history. I mean by that, that process of unified organic development which has its origin in the love of the family and which will not be completed until the whole of humanity becomes one family" (Hess 1862, 120).

However, this single family of mankind does not imply assimilation. At the end of history, all of the different races will "live on in friendly fashion with one another, but live each for the other, preserving, at the same time, their particular identity" (p. 121; italics in text). Jewish particularism is thus transformed into a genetically mediated messianic universalism in which Judaism will persist as a racial type in a utopian world it has altruistically led to universal harmony. In this future world, the German is faulted for desiring to possess their "fatherlands and dominions for himself. He lacks the primary condition of every chemical assimilative process, namely warmth" (p. 78). Hess also castigated the Reform Jew because of "the beautiful phrases about humanity and enlightenment which he employs as a cloak to hide his treason, his

fear of being identified with his unfortunate brethren" (p. 75)--an indication that he viewed Reform Jews as attempting to deceive Germans into believing that they had no interest in Jewish nationalism or the fate of Jews in other countries.

There were also parallels between the views of the anti-Semite Richard Wagner and the Zionist Ahad Ha-Am (pseudonym of Asher Ginsberg) (Katz 1986b).²² Both developed the idea that Jews could not have their own artistic spirit because they failed to identify completely with the surrounding culture. In an essay originally published in 1889, Ha-Am (1922, 3) claimed Judaism was not merely a religion but a nation bound together with deeply felt emotional bonds. Like many anti-Semites, Ha-Am also had a well-developed anti-individualist perspective, in which Jews must view themselves as a part of the larger corporate group and sacrifice their personal interests for the good of the group: "For the people is one people throughout all its generations, and the individuals who come and go in each generation are but as those minute parts of the living body which change every day, without affecting in any degree the character of that organic unity which is the wholebody" (p. 8).²³

Racialist views were especially common among what Ragins (1980, 132ff) terms the second generation of Zionists, many of whom came to maturity in the 1890s.²⁴ The Zionist journal *Die Welt* published several articles with a racialist, Volkische ideology in the late 19th and early 20th centuries. A writer argued that the Jews were a race with distinctive physical features and had retained their racial purity over four thousand years. Another contributor argued that this racial distinctiveness precluded assimilation: "Those who demand assimilation of us either do not yet know that a man cannot get out of his skin . . . or else they know this and then expect of us shameful, daily humiliation, which consists in feigning Aryanism, suppressing our instincts, and squeezing into the skin of the Aryan, which does not fit us at all" (in Ragins 1980, 150). Another author agreed with the racialist writings of Gobineau, who emphasized the high level of racial purity among the Jews and the incompatibility of Jews with other races (Ragins 1980, 151).

All of the Zionist racial scientists studied by Efron (1994; see also Endelman 1991, 196), including Elias Auerbach, Aron Sandler, Felix Theilhaber, and Ignaz Zollschan, were motivated by a perceived need to end Jewish intermarriage and preserve Jewish racial purity.²⁵ Only by creating a Jewish homeland and leaving the assimilatory influences of the diaspora could Jews preserve their unique racial heritage.

Thus, for Auerbach, Zionism would return Jews "back into the position they enjoyed before the nineteenth century--politically autonomous, culturally whole, and racially pure" (Efron 1994, 136). Zollschan, whose book on "the Jewish racial question" went through five editions and was well known to both Jewish and gentile anthropologists (Efron 1994, 155), praised Houston Stewart Chamberlain and advocated Zionism as the only way to retain Jewish racial purity from the threat of mixed marriages and assimilation (Gilman 1993, 109; Nicosia 1985, 18).²⁶ Zollschan's description of the phenotypic, and by implication genetic commonality of Jews

around the world is striking. He notes that the same Jewish faces can be seen throughout the Jewish world among Ashkenazi, Sephardic, and Oriental Jews. He also remarked on the same mix of body types, head shapes, skin, and hair and eye pigmentation in these widely separated groups (see Efron 1994, 158).

Arthur Ruppin, the German Zionist and demographer, was an important historical figure who "represented and symbolized the second era in Zionism" (Bein 1971, xix) and whose writings were sufficiently well known to merit comment by American leaders of the Reform movement (Levenson 1989, 327). (Werner Sombart [1913, 285] cited Ruppin and Elias Auerbach to support his impression that "today, so far as I can make out, the... view prevails that from the days of Ezra to these the Jews have kept strictly apart" and that as a result they constituted a distinct racial group.) Ruppin consistently advocated the view that there was an ethical imperative to retain Jewish racial purity. Ruppin had a clear conception of the importance of Jewish "racial types" as central to historical Judaism.²⁷ In an argument reminiscent of the long history of conceptualizing Judaism as a "light unto the nations," Ruppin (1913, 218) stressed that the Jewish intellectual ability was utilized for humanity as a whole, "for the common good." In Ruppin's view, Jews have had an immense positive influence on civilization, one that has benefited all humans. But racial admixture would destroy the unique Jewish contribution to civilization--an argument which, apart from its assertion of Jewish ethical altruism vis-a-vis the gentiles, is reminiscent of those presented by many theorists of Aryan racial superiority.²⁸

"We can thus accept the high intellectuality of the Jews without reserve, and are justified in desiring to preserve this high human type . . . as a separate entity, unmixed, because this is the only possible way to preserve and develop the race-character. Any highly cultivated race deteriorates rapidly when its members mate with a less cultivated race, and the Jew naturally finds his equal and match most easily within the Jewish people. We cannot absolutely assert that the mixture of Jews with other races invariably produces a degenerate posterity. . . It is certain, however, that by intermarriage the race-character is lost, and the descendants of a mixed marriage are not likely to have any remarkable gifts. . . . Intermarriage being clearly detrimental to the preservation of the high qualities of the race, it follows that it is necessary to try to prevent it and to preserve Jewish separatism. (Ruppin 1913, 227-228)"

Another noteworthy Jewish racialist thinker was Martin Buber, the prominent Zionist and theologian, who wrote of the Jewish Volkgeist and advocated greater pride in the distinctive Jewish racial features: "A Volk is held together by primary elements: blood, fate--insofar, as it rests upon the development of blood--and culturally creative power--insofar as it is conditioned by the individuality which arises from the blood" (in Ragins 1980, 157). Buber idealized the hyper-collectivist Jewish Hasidim as a basis for contemporary Judaism because of their intensely emotional commitment to the group and their mystical love for the Volk (Mosse 1970, 85). "Just as the Germans attempted to root this mystical tradition in their national mystique, so Buber eventually attempted to embody this Mytlios in the Jewish Volk, exemplified by the Hasidim" (Mosse 1970, 87). As a result of Buber's influence, Zionist publications during the Weimar years

"were replete with favorable references to 'the mysticism of blood,' 'racial genius,' and the 'Jewish people's soul'" (Niewyk 1980, 131).²⁹

This Volkisch idea of a membership in a highly cohesive group was pursued by a great many Jewish youth who, by World War I and thereafter, "found an answer to their Jewishness through a deepening of the experience that bound them together, with their own age and kind, in a meaningful community" by joining the Jewish Bund (Mosse 1970, 98-99). The concurrent German Youth Movement satisfied similar desires for membership in cohesive groups among gentile Germans. Although the German Youth Movement tended to not fuse Volkische thinking with racism and exclusivism even into the Weimar period (Mosse 1970, 20), many Jewish and gentile German youth were in fact members of mirror-image, emotionally compelling, cohesive groups: "Once again one is struck by the common strivings of Jewish and German youth" (Mosse 1970, 99).

Interestingly, Franz Oppenheimer decried the racist tendencies of some of his fellow Zionists, noting that "a racial pride swaggered which was nothing other than the photographic negative of anti-Semitism" (in Ragins 1980, 124)-- a comment that reinforces the "mirror-image" theme of this chapter and indicates that for many Jewish Zionists, Jewish racialism went beyond merely asserting and shoring up the ethnic basis of Judaism, to embrace the idea of racial superiority. Consistent with the anti-assimilationist thrust of Zionism, very few Zionists intermarried, and those who did, such as Martin Buber, found that their marriages were problematic within the wider Zionist community (Norden 1995). In 1929 the Zionist leaders of the Berlin Jewish community condemned intermarriage as a threat to the "racial purity of stock" and asserted its belief that "consanguinity [kin] of the flesh and solidarity of the soul" were essential for developing a Jewish nation, as was the "will to establish a closed brotherhood over against all other communities on earth" (in Niewyk 1980, 129-130).

Jewish assertions of racial superiority may have been tempered somewhat by the anti-Semitic climate of Central Europe. For example, Ignaz Zollschan argued that Jewish intellectual superiority was the result of heredity resulting from eugenic practices within the Jewish community--a view for which there is ample empirical support (PTSDA, Ch. 7): Jews who were not adept at religious study lost out in the "struggle for existence" (see Efron 1994, 106). However, Zollschan's lauding of Jewish achievements and Jewish racial superiority had a "defensive" ring that Efron (1994, 162) attributes to the anti-Semitic climate surrounding him. On the other hand, Joseph Jacobs, writing in a much less anti-Semitic England, could freely discuss his views on the intellectual and moral superiority of Jews in the most respectable academic circles, including those frequented by his mentor, Sir Francis Galton (Darwin's cousin and the founder of biometrical genetics and the eugenics movement).

Assertions of Zionist racialism continued into the National Socialist period, where they dovetailed with National Socialist attitudes. Joachim Prinz, a German Jew who later became the head of the American Jewish Congress, celebrated Hitler's ascent to power because it signaled

the end of the Enlightenment values which had resulted in assimilation and mixed marriage among Jews: "We want assimilation to be replaced by a new law: the declaration of belonging to the Jewish nation and the Jewish race. A state built upon the principle of the purity of nation and race can only be honoured and respected by a Jew who declares his belonging to his own kind.... For only he who honours his own breed and his own blood can have an attitude of honour towards the national will of other nations. (From J. Prinz, *Wir Juden* [We Jews] [1934]; in Shahak 1994, 7 1-72; italics in text)"

In 1938, Stephen S. Wise, president of the American Jewish Congress and the World Jewish Congress, stated that "I am not an American citizen of the Jewish faith, I am a Jew. . . . Hitler was right in one thing. He calls the Jewish people a race and we are a race."³⁰

The common ground of the racial Zionists and their gentile counterparts included the exclusion of Jews from the German Volksgemeinschaft (Nicosia 1985, 19). Indeed, shortly after Hitler came to power, the Zionist Federation of Germany submitted a memorandum to the German government outlining a solution to the Jewish question and containing the following remarkable statement. The Federation declared that the Enlightenment view that Jews should be absorbed into the nation state: "discerned only the individual, the single human being freely suspended in space, without regarding the ties of blood and history or spiritual distinctiveness. Accordingly, the liberal state demanded of the Jews assimilation [via baptism and mixed marriage] into the non-Jewish environment. . . . Thus it happened that innumerable persons of Jewish origin had the chance to occupy important positions and to come forward as representatives of German culture and German life, without having their belonging to Jewry become visible. Thus arose a state of affairs which in political discussion today is termed "debasement of Germandom," or "Jewification." . . . Zionism has no illusions about the difficulty of the Jewish condition, which consists above all in an abnormal occupational pattern and in the fault of an intellectual and moral posture not rooted in one's own tradition. (In Dawidowicz 1976, 150-152)"

Most Jews did not openly espouse racist views in the period we are discussing--at least partly because they were aware of the ultimate danger of racist thinking to Judaism (Ragins 1980, 137). Racist rhetoric by Jews was publicly condemned by some Jewish leaders because of fears of anti-Semitism (Ragins 1980, 137). Recognizing this danger, a major focus of the *Zentralverein deutscher Staatsbürger jüdischen Glaubens* (Central Association of German Citizens of Jewish Faith)--the main self-defense organ of German liberal Judaism--was to combat what it termed "racial Semitism" (Levy 1975, 156).

However, it is quite possible that racist views were more often expressed privately than publicly. Lindemann (1997, 91) notes that "even within those universalistic convictions were nuances with racist undertones" and cites the French-Jewish writer Julian Benda who observed that there "were certain magnates, financiers rather than literary men, with whom the belief in the superiority of their race and in the natural subjection of those who did not belong to it, was visibly sovereign." A number of Jewish leftist politicians in France "harbored a sense of their

special merit or destiny as Jews to be political leaders, what they considered their "right to rule." There is considerable evidence that German Jews during this period were engaged in deception and self-deception regarding their behavior and motivations (see Chapters 6-8), so it would not be at all surprising to find Jews who sincerely believed Judaism had no ethnic connotations and nevertheless opposed intermarriage and conversion, as well as others who believed it privately but denied it publicly for political reasons.

Ragins (1980, 85) notes the tension between the statements of liberal Jews that Judaism was nothing more than a religion and their recognition that traditional Judaism had been far more than that. The claim that Judaism was nothing more than a religion conflicted with the reality that "there was a sense of relatedness and cohesiveness among Jews which seemed to extend beyond the lines drawn by religious factions, uniting Orthodox and Reform" (Ragins 1980, 85). Recognizing this, the Zentralverein at times acknowledged that Judaism was more than simply a religion and should be defined by a "consciousness of common descent [Abstammung]" (Ragins 1980, 85), or race (p. 86). Thus in 1928 the director of the Zentralverein asserted that Jews had been a race since biblical times and concluded that "extraction remains, that is, the racial characteristics are still present, albeit diminished by the centuries; they are still present in external as well as mental features" (in Friedlander 1997, 119).³¹

The vacillation and ambivalence surrounding racial conceptualizations of Judaism were also present in American Reform circles in the late 19th century: "It was not uncommon for a rabbi to make bold pronouncements about his desire for a universalistic society and then, in moments of frustration or doubt, revert to a racial understanding of the Jews. . . . While willing to stretch the definition of Judaism to its limits, it was clear that most Reformers were not willing to break the historical continuity of the Jewish "race." Even Solomon Schindler, . . . one of the most radical of Reform rabbis, felt compelled to acknowledge the racial aspect of Jewish identity. Despite the high universal task of Judaism, wrote Schindler, "it remains a fact that we spring from a different branch of humanity, that different blood flows in our veins, that our temperament, our tastes, our humor is different from yours; that, in a word, we differ in our views and in our mode of thinking in many cases as much as we differ in our features." (Goldstein 1997, 50-51)"

Besides the Zionists and a vacillating body of liberal Jewish opinion, there are several other important Jewish intellectuals who are not associated with Zionism but nevertheless had strongly racist views. Heinrich Graetz (1817- 1891), the prominent historian of Judaism, was enthusiastic about the proto-Zionist ideas of Moses Hess, whose work, as we have seen, has strong overtones of attitudes of racial superiority. Graetz believed that Jews could solve the world's problems and "sometimes seemed to think Jews would provide actual world leadership. At others it was to be merely an ethical example. But in either event he presented the Jews as a superior people" (Johnson 1988, 331). Graetz's sense of Jewish racial superiority was repulsive to gentiles, and there was an exchange with Heinrich von Treitschke in which the latter characterized Graetz as an exemplar of the "boasting spirit which, he alleged, was in the ascendant in Jewish circles and was to be regarded as a menace to the German empire" (in Bloch

1898, 77). Graetz's work provoked a negative reaction not only in Treitschke but the German academic establishment as a whole (Levenson 1989, 329). While intellectuals like Treitschke saw Christianity as a unifying force for the German nation, Graetz wrote to his friend Moses Hess that Christianity was a "religion of death," and Hess wrote to Graetz of his delight in "scourging Germans." Graetz perceived Jews as battling to destroy Christian culture: "we must above all work to shatter Christianity" (in Lindemann 1997, 91). These attitudes among prominent Jewish intellectuals exemplify the theme of cultural conflict between Jews and gentiles as a theme of anti-Semitism (p. 50ff).

There is a sense of Jewish racial superiority in Graetz's writings as well as hints that he believed in the importance of racial purity: "There were but two nations of creative mind who originated [high] culture and raised humanity from the slough of barbarity and savagery. These two were the Hellenic and the Israelite people. There was no third race of coadjutors.... If the modern Roman, German, and Slavonic nations, both on this side and on the other side of the ocean, could be despoiled of what they received from the Greeks and the Israelites, they would be utterly destitute. (Graetz 1898, VI, 706)"

However, the Jews have continued as a creative race into the present, while the Greeks gradually merged with the barbarians and lost their distinctiveness--a point remarkably similar to Houston Stewart Chamberlain's "chaos of peoples" idea described above, in which the decline of the ancient world is attributed to loss of racial purity: "[The Greeks] despaired of their bright Olympus, and at best only retained sufficient courage to resort to suicide. The Greeks were not gifted with the power of living down their evil fortune, or of remaining true to themselves when dispossessed of their territories; and whether in a foreign country or in their own land they lost their mental balance, and became merged in the medley of barbaric nations."³²

The psychoanalytic movement was also characterized by ideas of Jewish intellectual superiority, racial consciousness, national pride, and Jewish solidarity (Klein 1981, 143)³³ Freud and his colleagues felt a sense of "racial kinship" with their Jewish colleagues and a "racial strangeness" to others (Klein 1981, 142; see also Gilman 1993, 12ff, and *The Culture of Critique*, Ch. 4). Commenting on Ernest Jones, one of his disciples, Freud wrote that "the racial mixture in our band is very interesting to me. He [Jones] is a Celt and hence not quite accessible to us, the Teuton [i.e., C. G. Jung] and the Mediterranean man [himself as a Jew]" (in Gay 1988, 186).

Perhaps the clearest indication of Freud's racist thinking is his comment to a Jewish woman who had previously intended to have a child by C. G. Jung in order to reconcile the Aryan/Jewish split in psychoanalysis at the time. Freud observed "I must confess. . . that your fantasy about the birth of the Savior to a mixed union did not appeal to me at all. The Lord, in that anti-Jewish period, had him born from the superior Jewish race. But I know these are my prejudices" (in Yerushalmi 1991, 45).

A year later after the woman had given birth to a child by a Jewish father, Freud wrote, "I am, as

you know, cured of the last shred of my predilection for the Aryan cause, and would like to take it that if the child turned out to be a boy he will develop into a stalwart Zionist. He or she must be dark in any case, no more towheads. Let us banish all these will-o'-the-wisps! I shall not present my compliments to Jung in Munich.... We are and remain Jews. The others will only exploit us and will never understand and appreciate us. (In Yerushalmi 1991, 45)"

In the following passage from *Moses and Monotheism*, the Jews are proposed to have fashioned themselves to become a morally and intellectually superior people: "The preference which through two thousand years the Jews have given to spiritual endeavour has, of course, had its effect; it has helped to build a dike against brutality and the inclination to violence which are usually found where athletic development becomes the ideal of the people. The harmonious development of spiritual and bodily activity, as achieved by the Greeks, was denied to the Jews. In this conflict their decision was at least made in favour of what is culturally the more important. (Freud 1939, 147)"³⁴

Freud's attitudes were fully mirrored by non-Jewish theorists (Gilman 1993, 12ff).³⁵ Jung's ideas on racial archetypes differ from Freud's views only in the type of traits emphasized as characteristic of the two groups. While Freud emphasized the brutality, violence, and enslavement to the senses of the gentiles versus the spirituality, intellectuality, and moral superiority of the Jews, Jung held the view that the advantage of the "Aryans" was in their energy and untapped potential resulting from their relatively recent rise from barbarism. On the other hand, Jews, required to exist as a minority in a host society, could create no genuine culture of their own. After the National Socialists assumed power, Jung became a prominent spokesman for the view that there were differences between Jewish and Aryan psychology.³⁶ In a 1934 article Jung emphasized that psychoanalysis had developed a very negative conception of the German character: "In my opinion it has been a grave error in medical psychology up till now to apply Jewish categories. . . indiscriminately to Germanic and Slavic Christendom. Because of this the most precious secret of the Germanic peoples--their creative and intuitive depth of soul--has been explained by a morass of banal infantilism, while my own warning voice has for decades been suspected of anti-Semitism. (In Yerushalmi 1991, 48-49)

Indeed, as elaborated in *The Culture of Critique*, a central function of Freud's *Totem and Taboo* appears to have been to combat "everything that is Aryan-religious" (in Gay 1988, 331), a comment that illustrates the extent to which Freud, like Hess and Graetz, viewed his work as an aspect of competition between ethnic groups. The early psychoanalytic movement self-consciously perceived itself as representing a Jewish intellectual offensive against "Aryan-Christian" culture in which religion and race overlapped entirely.

Even in the absence of an explicitly racist conceptualization of the differences between Germans and Jews, there was a feeling of estrangement and of being different peoples on both sides of the ethnic divide. Such attitudes were common in anti-Semitic writings throughout the 19th century (Rose 1990) and continued in the 20th century. In the correspondence of the early

1930s between Hannah Arendt and Karl Jaspers, Arendt fails to identify with Max Weber's "imposing patriotism." "For me Germany means my mother tongue, philosophy, and literature" (in Kohler & Saner 1992). Jaspers replies, "I find it odd that you as a Jew want to set yourself apart from what is German.... When you speak of mother tongue, philosophy, and literature, all you need add is historical-political destiny, and there is no difference left at all" (in Kohler & Saner 1992). Arendt, however, self-consciously rejects being part of this destiny of the German people. The concept of a "historico-political destiny of a people" clearly conceptualizes separate "peoples," but in Weber's view membership in the German people is open to Jews. Arendt is rejecting such membership and implicitly accepting the idea of a single culture but two separate peoples.³⁷

General feelings of peoplehood and thinking in terms of racial essences and racial differences were thus part of the *Zeitgeist* of the period--characteristic of Jewish as well as gentile intellectuals: "The breakdown of the liberal order during the closing decades of the nineteenth century [in Austria] brought back to the surface the opposing assumptions about social integration that had distinguished the Jewish from the non-Jewish sensibility. Annoyed by the parochial attachments of other people, and unreceptive to the idea of a pluralistic state, many non-Jews interpreted the Jewish assertion of pride as a subversion of the "enlightened" or egalitarian state. The Jewish stress on national or racial pride reinforced the non-Jewish perception of the Jew as a disruptive social force. (Klein 1981, 146)"

CONCLUSION

National Socialism and Judaism as Mirror-Image Group Strategies

From the perspective developed here, the acceptance of the ideology of an anti-Semitic group strategy among the NSDAP elite may well have been caused or at least greatly facilitated by the presence of Judaism as a very salient and successful racially exclusive antithetical group strategy within German society. In 1905, well before the National Socialists came to power, the anti-Semitic racial theorist Curt Michaelis asserted a relationship between Jewish racial pride (*Rassenstolz*) and anti-Semitism: "The *Rassenstolz* promoted race hatred in its sharpest form--the consequence of which is lasting race war. . . . The Jewish people stands principally in battle against the whole world; naturally, therefore, the whole world [is] against the Jews" (in Efron 1994, 170).

There is an eerie sense in which National Socialist ideology was a mirror image of traditional Jewish ideology. As in the case of Judaism, there was a strong emphasis on racial purity and on the primacy of group ethnic interests rather than individual interests. Like the Jews, the National Socialists were greatly concerned with eugenics. Like the Jews, there was a powerful concern with socializing group members into accepting group goals and with the importance of within-group altruism and cooperation in attaining these goals.

Both groups had very powerful internal social controls that punished individuals who violated group goals or attempted to exploit the group by freeloading. The National Socialists enacted a broad range of measures against Jews as a group, including laws against intermarriage and sexual contact, as well as laws preventing socialization between groups and restricting the economic and political opportunities of Jews. These laws were analogous to the elaborate social controls within the Jewish community to prevent social contact with gentiles and to produce high levels of economic and political cooperation.

Corresponding to the religious obligation to reproduce and multiply enshrined in the Tanakh, the National Socialists placed a strong emphasis on fertility and enacted laws that restricted abortion and discouraged birth control. In a manner analogous to the traditional Jewish religious obligation to provide dowries for poor girls, the National Socialists enacted laws that enabled needy young couples to marry by providing them loans repayable by having children.

As in the society depicted in the Tanakh and throughout Jewish history, the National Socialists regarded people who could not prove the genetic purity of their ancestry as aliens with fewer rights than Germans, with the result that the position of Jews in National Socialist society was analogous to the position of the Nethinim or the Samaritans in ancient Israelite society, or converts in historical Jewish societies, or the Palestinians in contemporary Israel.³⁸ As with Israel, the state had become the embodiment of an exclusivist ethnic group.

Both groups had a well-developed ideology of historical struggle involving the group; Kren and Rappaport (1980, 208) explicitly make this connection when they note that National Socialism "was founded on militant movements for Zionism, socialism, or Communism--movements that had always provided their members with a strong sense of historical struggle and an identification with group goals rather than individual satisfaction"--clearly a statement that could apply not only to Zionism but to traditional Judaism as a whole (see PTSDA, Ch. 6). Gordon (1984, 114) states that "it was clearly Hitler's conception that he was working for group goals--those of the 'Aryan people' and that his individual fate mattered little."

In this regard, Hitler's attitude that death was the only honorable fate for himself and his followers was entirely similar to that of the Jewish resisters of the period (Gordon 1984, 115). Kren and Rappaport (1980, 217) describe a situation in which "the youth--the best, the most beautiful, the finest that the Jewish people possessed--spoke and thought only about an honorable death. . . befitting an ancient people with a history stretching back over several thousand years."

Common Threads in Western Anti-Semitism

The most important common thread of Western anti-Semitism is the development of cohesive groups that mimic in critical ways the features of Judaism as a group evolutionary strategy. A related common thread has been that there is a tendency to shift away from attempts at complete

cultural and genetic assimilation of Jews in the early states of group conflict, followed eventually by the rise of collectivist, authoritarian anti-Semitic group strategies aimed at exclusion, expulsion, or genocide when it is clear that efforts at assimilation have failed. I have noted this phenomenon in the case of Germany during the 19th century, and this certainly appears to have been the case in Spain prior to the expulsion of 1492, following the failure of the forced conversions of 1391 and the consequent turmoil of the 15th century. In 12th-13th-century France there was a shift from a policy of toleration combined with attempts to convert Jews under Louis IX to a policy of "convert or depart" during the reign of Philip IV, and finally the expulsion of Jews in 1306 (Jordan 1989, 180). The final expulsion order is also a last plea for Jewish assimilation: "Every Jew must leave my land, taking none of his possessions with him; or, let him choose a new God for himself, and we will become One People" (in Jordan 1989, 214; italics in text).

As expected by an evolutionist, a third common thread has been that each Western anti-Semitic movement shows indications of a concern with one-way gene flow from the Jewish to the gentile population. Anti-Jewish writers have often emphasized Jewish males exploiting gentile females (see, e.g., pp. 49, 80n.2 1, 228). As an elite group, Jewish males in the absence of social controls would tend to have access to gentile females as concubines. There was deep concern in the ancient world regarding Jewish ownership of gentile female slaves. In areas where polygyny and concubinage were legal, there were typically restrictions on Jews being able to have concubines from the dominant religious or ethnic group (e.g., restrictions in Muslim areas preventing Jews from having Muslim but not Christian concubines). Concern about Jewish males exploiting gentile females also figures in laws dating from the period of the Inquisition (see pp. 237-238). In the medieval and early modern world, extending into the 20th century, there was concern in widely separated times and places about Jews employing Christian female domestics. And in late medieval Spain and 19th- and 20th-century Germany there was also concern that elite Jews were marrying their daughters into the gentile nobility while nevertheless retaining the genetic purity of their stem families. In all of these cases, Jewish stem families were able to retain genetic segregation.

The fact that Western societies have typically attempted to convert and assimilate Jews before excluding them indicates that Western societies, unlike prototypical Jewish cultures, do not have a primitive concern with racial purity. Rather, concern about racial purity emerges only in the late stages of Jewish-gentile group conflict and only in the context of a concern about the asymmetrical gene flow from the Jewish to the gentile gene pool.

On the other hand, despite a great deal of commonality among Western anti-Semitic movements, there was a great difference between the universalistic, assimilatory tendencies of traditional Western Christianity and the exclusivistic, racialist program of National Socialism. Indeed, we have seen that beginning in the 19th century an important aspect of German anti-Semitic ideology was a criticism of Western universalism and the development of peculiarly Germanic conceptions of Christianity. A critical component of official National Socialist ideology, as

represented in the thought of Alfred Rosenberg, was the idea that "the twin forces of disintegration, namely universalism and individualism, act in perpetual conflict with the Germanic concept of race" (Cecil 1972, 89). In this regard, National Socialism was indeed profoundly anti-Western. In rejecting both universalism and individualism, National Socialism resembled, much more closely than did medieval Western collectivist Christianity, its mirror image rival, Judaism.

Lack of Group-Based Competition as a Necessary Condition for Western Individualism

While intra-societal conflict between Jews and gentiles tends to be associated with the development of anti-individualist Western societies, the absence of conflict between powerful and impermeable ethnic groups may be a necessary condition for the development of the relatively individualistic Western societies of the post-Enlightenment world. This proposal is highly congruent with the social identity perspective of group conflict: as societies become structured around competing groups, people form strong group allegiances incompatible with individualism. Such a society is incompatible with the notion of individual rights because group interests become paramount: Within the ingroup, individual rights and interests must be sharply curtailed in the interests of group cohesion and the attainment of group interests. The context of between-group competition results in group membership rather than individual behavior or merit becoming the most important criterion of personal assessment. A Manichean morality of ingroup favoritism and outgroup hostility develops that is completely incompatible with individualism.

This hypothesis is consistent with the fact that the Enlightenment and the reemergence of individualism in Western Europe occurred most prominently in England and France, from which Jews had been almost completely excluded, while "the basic fact about German history since the eighteenth century has been the failure of the Enlightenment to take root" (Mosse 1964, 21-22).

It was a failure that was undoubtedly made the more likely by the fact that throughout the entire era, liberal political views were strongly supported by Jews and were perceived as benefiting Jews--a fact that the opponents of these ideas never failed to emphasize. Indeed, a social identity perspective would expect that initially minor differences between the groups (e.g., Jews tending toward liberal internationalism, gentiles toward conservative nationalism) would become increasingly polarized as group conflict escalated. Personal identity would eventually become increasingly demarcated not only by ethnicity but also by political attitudes, with the result that the political beliefs of the opposition become an important, negatively evaluated marker of outgroup membership. For a German, to be a liberal would eventually be tantamount to favoring a negatively perceived outgroup.

Political liberalism was the antithesis of the strong desire of many Germans to develop a powerful, highly cohesive nation. For many anti-Semites, most notably the anti-Semitic Volkische intellectuals, such as Paul de LaGarde, negative attitudes toward Jews were intimately intertwined with a loathing of liberalism and unrestrained, irresponsible capitalism, combined

with a strong desire for a powerful sense of community (Stern 1961, 64, 66).³⁹ Indeed, late-19th-century Zionists commonly believed that an important source of opposition to liberalism among gentiles stemmed from the perception that liberalism benefited Jews in competition with gentiles; thus Theodor Herzl believed that "emancipation had placed an intolerably heavy strain on Austrian liberals, who had to defend an economic system that eased the way for recent outsiders into positions of prominence" (Kornberg 1993, 180).

The hypothesis that individualism is incompatible with group-based conflict is also consistent with Americo Castro's (1954, 497; see also Castro 1971) perspective that the Enlightenment could not develop in a Spain fraught with competition between ethnic groups: "From such premises it was impossible that there should be derived any kind of modern state, the sequel, after all, of the Middle Ages' hierarchic harmony." Similarly, Grayzel (1933, 83) comments that the exclusion of Jews from Christian society, which was the focus of ecclesiastical policy in the 13th century, might have occurred even in the absence of the Church's actions; another factor besides religious difference that he argues might have led to exclusion was racial: "The Jews persistently refused to mingle their blood with that of their gentile neighbors at a time when racial intermingling was laying the foundations of the modern national state."

The implication is that the Western tradition of muted individualism and its concomitant democratic and republican political institutions are unlikely to survive the escalation of intrasocietal group-based competition for resources that is such a prominent theme of contemporary American society. I have previously quoted Pulzer's (1964, 327) comment, "The Jew could flourish only in the sort of classical Liberal society that existed in Western Europe and that the late nineteenth century had introduced to Central Europe." While Judaism flourishes in a classical liberal, individualist society, ultimately Judaism is incompatible with such a society, since it unleashes powerful group-based competition for resources within the society, which in turn lead to highly collectivist gentile movements incompatible with individualism. It is also noteworthy that the 19th-century liberal critics of Judaism typically assumed that it would disappear as a result of complete cultural and genetic assimilation—a sort of tacit understanding that a liberal society required a fairly high degree of cultural uniformity.

My view, which I elaborate in *The Culture of Critique*, is that Western societies have a tendency to seek an equilibrium state of hierarchic harmony among the social classes in which there are powerful controls on extreme individualism among the elite classes. This tendency toward hierarchic harmony—a paradigmatic feature of the Christian Middle Ages—combined with assimilationism and individualism has been a powerful force in breaking down barriers within society. The difficulty for a group strategy like Judaism is that, if assimilation fails, the Western tendencies toward universalism and individualism are abandoned. From this perspective, it is no accident that the National Socialist theorist Alfred Rosenberg regarded the Western concepts of universalism and individualism as anathema: Both concepts were incompatible with National Socialism as a closed ethnic group strategy. It is in this sense that the individualist, universalist strands of Western culture are indeed incompatible with Judaism.

Finally, given the Western tendency toward "muted individualism" and hierarchic harmony, there is the suggestion that in the absence of a hated and feared outgroup such as the Jews, there would be a tendency toward decomposition of collectivist, authoritarian social structures in the West. From this perspective, the apparently primitive Western tendency toward a significant degree of individualism, possibly deriving ultimately from a unique ancestral environment (see PTSDA, Ch. 8), results in an inertial tendency toward assimilatory, reproductively egalitarian, and moderately individualistic societies. However, these tendencies may be altered in the direction of authoritarian collectivism under conditions of perceived intrasocietal group-based competition, as discussed throughout this and the previous two chapters.

Egalitarianism and Western Group Strategies

It has been noted that National Socialism was characterized by a significant degree of within-group egalitarianism. This tendency toward within-group egalitarianism can also be seen in the conscious attempt to portray Hitler as an idealistic, ascetic hero who tirelessly pursued group interests rather than his own interests. This portrayal of Hitler had some basis in reality well before he came to power, and it later became a prominent feature of National Socialist propaganda (Bracher 1970, 66). Clearly, a fundamental feature of National Socialism was the belief that within the group there would be significant reciprocity, cooperation, even altruism, and that differences in rank would not be closely tied to variation in the markers of reproductive success.

From an evolutionary perspective under conditions of exogamy, the appeal of a group strategy is likely to be increased by the belief that other members of the group, and especially the leaders, are personally ascetic. In a despotic situation, lower-status males are more likely to perceive themselves as exploited by upper-status males and as benefiting little from cooperation or altruism. Self-sacrifice and voluntary cooperation in such a situation are expected to be minimal because the benefits of such behavior are more likely to accrue to the despot while the costs are borne by the lower-status males. At the extreme, if the lower-status male is a slave, cooperation and self-sacrifice are expected to only occur as the result of coercion (see also PTSDA , Ch. 1).

The appeal of asceticism among leaders would be expected to increase dramatically in a situation where the group as a whole has relatively little genetic cohesiveness. I propose that because of the low degree of genetic relatedness within the society, cohesive and anti-individualistic Western group strategies tend to be characterized by leaders who accept asceticism, celibacy, or in general do not have relatively high reproductive success compared to the others in the movement. As indicated in PTSDA (Chs. 6, 8), the high levels of endogamy and consanguinity [marrying close relatives or inbreeding] of Jewish groups are an important aspect of Judaism as a group evolutionary strategy, because they result in individual fitness being correlated with group success. Individual Jews are therefore expected to be much more tolerant of large differences in resources and reproductive success within the Jewish community and more tolerant of the authoritarian political structure of the traditional Jewish community;

this is the case not only because they benefit from Jewish charity, but also because they benefit genetically to a considerable extent when other Jews succeed.

However, in an exogamous, assimilative Western society, lower-status individuals benefit less from the success of upper status individuals. A significant degree of personal asceticism in leaders may therefore be necessary in order to obtain the allegiance of the lower orders. The suggestion, then, is that ultimately exogamy and genetic assimilationism are the reasons that reproductive egalitarianism tends to be characteristic of Western collectivist movements. As reviewed in MacDonald (1995b), there has indeed been a strong trend toward reproductive leveling in Western societies beginning in the Middle Ages. The Franciscan and Dominican friars who spearheaded the anti-Semitism and collectivist tendencies of the medieval period also led ascetic lives despite their origins in the middle and upper-middle classes. Their activities appear to have been critical to the development of the intense religious fervor and commitment characteristic of all levels of medieval society--an integral component of the *societas Christiana*. For example, Lawrence (1994, 126) notes that "the voluntary poverty and self-imposed destitution that identified the early Mendicants with the humblest and most deprived sections of the population, in loud contrast to the careerism and ostentation of the secular clergy and the corporate wealth and exclusiveness of the monasteries, moved the conscience and touched the generosity of commercial communities."

"St. Francis and St. Dominic. . . gave to the Church a new form of religious life, which had an immense and permanent appeal, and one which both attracted a new type of recruit and in its turn inspired an apostalate to the laity, to the heretic and to the heathen. Not only did the appearance of the friars rescue the western church from its drift toward heresy and schism, but the new warmth of devotional life, the preaching, the confessing and the daily counsel of the friars gave a new strength to the lower level of Christian society and indirectly acted as a powerful agent of spiritual growth and social union, thus inevitably compensating for the growing power of legalism and political motives at the higher levels of church life. (Knowles & Obolensky 1968, 345)"

Moreover, while Western medieval reproductive altruism occurred as an aspect of commitment to a collectivist group, reproductive leveling continued after the collapse of the medieval church (MacDonald 1995b) and continues in contemporary individualistic and democratic Western societies. Thus the sex lives of the presidents of the United States are closely scrutinized for suggestions that they have not been monogamous. And even if public figures engage in non-monogamous sex, they do it clandestinely, since it would be political suicide to publicize the fact and take pride in it.

As in the case of Judaism, therefore, but for somewhat different reasons, the group must be viewed as an important level of adaptation in conceptualizing historical Western societies.

The foregoing suggests a theoretical association between exogamy and egalitarianism that

transcends the individualism/collectivism dichotomy which has been central to my treatment. Political coalition building in exogamous societies tends to result in attempts at egalitarian social controls on the leadership, because lower-status males have a powerful interest in controlling the reproductive behavior of the elite. Such attempts may not succeed, so that a despotism is always a possibility. Nevertheless, exogamy implies that lower-status individuals do not benefit from the reproductive success of the elite, and as a result popular support of either individualist or collectivist political entities is facilitated by reproductive egalitarianism.

NOTES

1. According to the First Decree of the Reich citizenship law of November 14, 1935, a Jew was defined as an individual with at least three Jewish grandparents "who are fully Jewish as regards race" (in Dawidowicz 1976, 45-47). However, a person was considered to be a "Jewish Mischling" and therefore classified as a Jew if he or she had two Jewish grandparents who belonged to the Jewish religious community as of September 15, 1935, or thereafter, or was the offspring of a marriage concluded by a Jew, or was married to a Jew on that date or later, or who was the result of extramarital relations between a Jew and a gentile. Apart from individuals married to a Jew, individuals who were one-eighth Jewish or less were considered Germans.
2. Harris (1994, 227) notes that propagandists like Stoecker "made the anti-Semitism of the common man intelligible to the educated, not vice versa. Their anti-Semitic activities show the gradual acceptance of anti-Semitism by polite society rather than the injection of those ideas into mass culture by either fanatic zealots or Machiavellian politicians." Indeed, it was the educated elites who were most supportive of Jewish emancipation (p. 230)-a finding that is highly compatible with the general tendency throughout Jewish history for Jewish alliances with gentile elites in the context of popular anti-Semitism (see Chapter 2 and PTSDA, Ch. 5). Nevertheless, Field (1981, 227) notes that aristocrats "hard pressed by declining land revenues and higher property taxes, resentful of the purchase of Berlin's sumptuous palaces by Jews, and eager to share the Kaiser's new fads" familiarized themselves with the writings of Houston Stewart Chamberlain.
3. Harris (1994, 227) notes the high degree of personal popularity of Hitler and the substantial support for the NSDAP and its highly salient anti-Semitism in the elections of 1932. He makes the interesting point that the National Socialists were the only party to draw substantial support from all social classes-suggesting that National Socialism transcended class divisions and was perceived as the political embodiment of the ideal of hierarchical harmony long held as an ideal in the Volkische intellectual tradition.
4. The data provided by Lowenstein (1992, 24) indicate that in 1901-1905 in Germany 8.8 percent of Jewish men and 7.6 percent of Jewish women intermarried. These percentages increased in the following years so that by 1926-1930, 25.6 percent of Jewish men and 16.6 percent of Jewish women had intermarried. These figures include Jews who married other

secular and converted Jews and who remained part of the Jewish community and hence are useless for conceptualizing the extent to which Judaism had continued as a genetically closed group evolutionary strategy. Moreover, defections from Judaism, as measured by conversions to Christianity, remained low. Lowenstein (1992, 24) finds that conversions averaged 168 per year in the period from 1800 to 1924 and 256 per year in the period from 1880 to 1899. These figures are also overestimates of true defection, however, since many of these conversions were conversions of convenience by individuals who continued to identify as Jews and continued their associations with the Jewish community (see also Chapter 6). Patai and Patai (1989) note that intermarried couples in Germany during this period, at least in the earlier surveys, tended to have fewer children and not to raise them as Jews with the result that only 4.05 percent of the children born to Jewish mothers were children of intermarried couples who raised their children as Jews or were children born out of wedlock to Jewish women with Christian fathers.

5. The phrase "hierarchic harmony" comes from Americo Castro's (1954, 497) description of the social structure of the Western Middle Ages. Not coincidentally, many Volkische thinkers idealized the Middle Ages.

6. Volkische ideology was compatible with a strong but muted role for individualism. The anti-Semite Paul de LaGarde emphasized that individuals should be able to maximize their unique potentials within the cohesive group (Stem 1961, 28). On the other hand, he was greatly concerned that the working classes had become alienated from German society because of the individualistic behavior of capitalists.

7. The tract also contains the following exhortations: "Thou shalt have no social intercourse with the Jew"; "Thou shalt have no business relations with the Jew"; "Thou shalt not entrust thy rights to a Jewish lawyer, nor thy body to a Jewish physician, nor thy children to a Jewish teacher. . . ."; "Keep away all Jewish writings from the German home and hearth lest their lingering poison may unnerve and corrupt thyself and thy family" (in Massing 1949, 3 06-307).

8. Marr later repudiated the idea of genetic assimilation via intermarriage in his 1879 book *The Victory of Judaism over Germanism*.

9. See Krausnick (1968, 10); Field (1981, 447). Beginning in 1923, Chamberlain's and Hitler's circles increasingly intersected. Chamberlain met Hitler on more than one occasion, and there was a mutual admiration between the two, including highly laudatory letters from Chamberlain to Hitler which Hitler greatly appreciated (Field 1981, 436-438). By the end of Chamberlain's life, Hitler seems to have developed a great deal of affection for him, and he personally attended his funeral. Another high-ranking National Socialist closely associated with Chamberlain was Alfred Rosenberg. Rosenberg was ecstatic about Chamberlain's *Foundations* when he first read it in 1909 as a seventeen-year-old, and he became a fervent disciple (Cecil 1972, 12-14; Field 1981, 232). Other National Socialists who had read Chamberlain and claimed to be influenced by him include Hess, Goebbels, Eckart, Himmler, and von Shirach (Field 1981, 452). Goebbels

met Chamberlain and declared that Chamberlain was "the pathbreaker," "the preparer of our way," "the father of our spirit" (in Reuth 1993, 53).

10. See also Derek Wilson (1988, 286). It is interesting that the marriage of the only child of Salomon and Adele Rothschild (of the French branch of the family) to a Christian resulted in a complete excision of the daughter from her mother's life, without any inheritance. This is compatible with supposing that only-daughters were in a different category than daughters with brothers, quite possibly because the marriage of the only-daughter outside the group would, in practical effect if not according to Jewish law, place all of the family's descendants outside the Jewish community. The consequences of a male attempting to marry outside the group were severe: When a male in the Austrian branch of the family fell passionately in love with the daughter of an American boardinghouse keeper, his father was inflexible in his opposition, and the son, in despair, committed suicide in 1909 (Derek Wilson 1988, 276).

11. Moreover, it is worth noting that there was considerable doubt expressed in the Palestinian Talmud (Y. Qidd. 3.12) about the status of the offspring of an Israelite female married to a gentile, with some authorities pronouncing the offspring *manzers* (bastards) following the (non-Israelite) status of the father. It is therefore highly doubtful that such individuals would have been welcomed in the Jewish community even had they attempted to remain.

12. Consanguinity [inbreeding] often overlapped with economic interests among these families. Mosse (1989, 97) notes that a "distinctive form of economic co-operation involving close kinship links was that between members of allied families, the Ellingers, Mertons, and Hochschilds in the Frankfurt Metallgesellschaft, for example, the Oppenheims, Warschauers, and Mendelssohn-Bartholdys in the AG fur Anilinfabrikation (Agfa) in Treptow, or the Ganses and Weinbergs in Leopold Cassella. In all, the cases of joint economic activity by close kin are so numerous that the family rather than the individual could almost be regarded as the typical Jewish entrepreneur."

13. As discussed in several sections of PTSDA, group selection has made a resurgence in evolutionary thinking, most notably as a result of the work of David S. Wilson (see Wilson & Sober 1994).

14. Degler (1991, 46) notes that despite the opposition of socialist newspapers, four of five socialist representatives in the Wisconsin legislature voted for a eugenic law mandating sterilization of certain criminals, and Edward A. Ross, the prominent progressive sociologist from the University of Wisconsin, testified in favor of the law. Such laws were much more characteristic of the reformist North and West than the conservative South.

15. Neither Francis Galton nor Karl Pearson, the guiding lights of British eugenics, emphasized race as a variable in their publications on eugenics. During the 1880s Pearson became attracted to German ideas and became a strong advocate of the idea that eugenic practices should be a

component of competition among groups rather than among individuals, but he conceptualized the group as the nation, not a race (Kevles 1985, 23). Earlier, Alfred Russel Wallace and W. R. Greg (but not Darwin) emphasized the need for eugenic practices to make the group more competitive, but again, the group was conceptualized as the nation (Farrall 1985, 17). Nevertheless, the beliefs that eugenics would improve the ability of the race and that Caucasians were a superior race were probably common among British eugenicists, including Galton and Pearson (Farrall 1985, 51). During the 1920s, Pearson opposed Jewish immigration on the grounds that Jewish girls were inferior and Jewish boys did not possess "markedly superior" intelligence compared to the native English (Pearson & Moul 1925, 126). This is a group-based argument, but it is certainly not the type of argument based on competition between well-defined racial groups that Chamberlain would have made. Pearson and Moul also wrote of Jews that "for men with no special ability-above all for such men as religion, social habits, or language keep as a caste apart, there should be no place. They will not be absorbed by, and at the same time strengthen the existing population; they will develop into a parasitic race, a position neither tending to the welfare of their host, nor wholesome for themselves" (pp. 124-125). The argument, then, is that if Jews did have markedly higher IQs, there would be no objection to immigration. Clearly Pearson is not casting his argument in a racist manner.

16. Despite their dislike of the Ostiuden and their concerns that the Ostiuden increased anti-Semitism, the German Jewish community provided aid to the immigrants and strongly opposed official discrimination against them, especially after 1890. Moreover, Volkov (1985, 211) notes that many Westiuden eventually developed positive attitudes toward their highly observant coreligionists from the East-an aspect of the increasing sense of Jewish identification among them.

17. The quotation from Rather is completed as follows: if we are foolish enough to bestow such titles on people who are merely repeating what they take to be the wisdom of their own fathers. Sidonia [the hero of Tancred] was in fact repeating the post-exilic doctrines of Ezra and Ezekiel when he warned against racial intermarriage, and these same doctrines gave biblical authority to Old Testament Christians in North America and South Africa to pursue their policies of segregation and apartheid, respectively." Rose (1992, 234) states that Rather's book "verges on veiled antisemitism," but, minimally, I see no reason to question Rather's scholarship on Disraeli. As Rather notes, the racialism of Disraeli and Moses Hess have been severely downplayed by Jewish scholars attempting to link National Socialism with gentile racist thinkers of the 19th century such as Gobineau and Chamberlain. (Similarly, Lindemann [1997, 77n.76] notes that George Mosse "devotes only a few lines in a single paragraph to Disraeli, yet he devotes pages of dense description and analysis to scores of anti-Semitic writers and theorists, many of whom attracted a limited readership and obviously exercised little influence on their contemporaries.") As noted below (see note 21 below), Rose has been a prominent apologist for 19th-century Jewish racist thought.

18. Disraeli's assertions of Jewish superiority were quite unsettling to Richard Wagner,

especially since Disraeli was the prime minister of England. After reading *Tancred*, Wagner referred to himself as a "tattooed savage," presumably a reference to Disraeli's low estimation of the Franks in *Tancred*. Disraeli's views were well known in England and were the subject of a negative contemporary commentary by George Eliot (although she appears to have approved eventually of Jewish racialism, as indicated by her novel *Daniel Deronda*). Disraeli's views were ridiculed by Thackeray and in the satirical journal *Punch*. In his satirical novel *Codlingsby*, Thackeray derided Disraeli's tendency in *Coningsby* to suppose that everyone of genius was a Jew, including Mozart and Rossini. In 1915, the prime minister of England, Herbert Asquith, recalled Disraeli's words in his reaction to a proposal to turn Palestine into a Jewish state: "It reads almost like a new edition of *Tancred* brought up to date . . . , a curious illustration of Dizzy's favourite maxim that 'race is everything,' etc." (in Rather 1986, 122). Disraeli's comments on the importance of race for understanding history were also quoted extensively by German racist writers in the 1920s (Mosse 1970, 56; Rather 1986, 122). See also Johnson (1987, 323ff) and Salbstein (1982, 97ff) for discussions of Disraeli's racist views. Salbstein terms Disraeli a "Marrano Englishman," because of evidence that Disraeli had a strong Jewish identity.

19. There was disagreement among Zionists as to whether anti-Semitism caused Jewish nationalism or Jewish nationalism was intrinsic to the nature of Judaism. Theodor Herzl took the former position, while Ahad Ha-Am took the latter point of view (Simon 1960, 103).

20. As discussed in PTSDA (Ch. 8), one theory of the evolution of recessive genes in northern Caucasian populations is Salter's (1996) "blank slate hypothesis" in which recessive genes act as an individualist anti-cuckoldry mechanism. Because of the commonness among the "Aryans" of recessive genes affecting physical appearance, the offspring of Jews and non-Jews in Germany therefore would tend to resemble the Jewish partner, thus leading to beliefs on both sides of the "indelibility" of the Jewish character.

21. Rose terms the racist views of Hess as "positive and humane" (1990, 321) (apparently because of Hess's stated belief that the Jews had originated as a racially mixed group) while condemning the racist views of 19th-century German antiSemites. In a bit of self-deception, Rose notes the parallels between Hess's and Wagner's racist views, "but how opposed were their ethics! Wagner insisted that his racial idea was based on love. But that was merely idealistic garb for the instinct of racial domination that Hess so bitingly desecrated everywhere in German revolutionary thought. Wagner ran true to revolutionary form in excluding the Jews from the festival of redemption; they could only be redeemed by destruction. Hess, on the other hand, cast them in the role of protagonists in the drama of cosmic redemption" (1990, 335). Klein (1981, 147- 149) makes a similar argument regarding the racism of the psychoanalytic movement. The idea that Judaism has a genetically based, altruistic role to play in human evolution may be more ethical. However, it would appear to be equally plausible to suppose that Hess's and Klein's comments are also an "idealistic garb" for self-serving rationalization of the type that has been common in Jewish intellectual history (see Chapter 7); that is, they legitimize

Jewish ethnocentrism as motivated by the loftiest of moral goals and ignore real conflicts of interest between Germans and Jews that were at least partly the result of Jewish ethnocentrism while condemning the ethnocentrism of the Germans. Rose also illustrates the tendency of many theorists of anti-Semitism to view the phenomenon as a fundamentally irrational construction of gentiles—a major theme of Jewish theories of anti-Semitism discussed extensively in *The Culture of Critique*. Rose repeatedly condemns as immoral the attitudes of anti-Semites that Jews were an ethnically distinct and unassimilable group within German society, that they hated gentiles, and that they were bent on the economic and cultural domination of gentiles, and he does so without ever considering the evidence for or against these propositions. Because of his complete lack of interest in actual Jewish behavior, one infers that Rose believes that data on the actual behavior of Jews are irrelevant to the rationality of these attitudes.

22. Wagner believed that the Jewish spirit was able to dominate the German spirit in art because Jewish influence in Germany had begun before the nation had a well-developed culture of its own—the result of political fragmentation since the Thirty Years' War. According to the diary of Cosima Wagner, Wagner stated in 1878 that "if ever I were to write again about the Jews, I should say I have nothing against them, it is just that they descended on us Germans too soon, we were not yet steady enough to absorb them" (see Rather 1990, 212).

23. Ha-Am (in Simon 1960, 102) condemned "enlightened" Western Jews who had "sold their souls" for civil rights: "I can proclaim my feeling of kinship with my fellow-Jews, wherever they may be, without having to defend it by far-fetched and unsatisfactory excuses"—an implicit rebuke of the Reform project of rejecting the language of kinship and nationalism in developing elaborate rationales for continued Jewish group cohesion in the post-Enlightenment world. Like the German Volkische thinkers, Ha-Am believed that each nation, like each person, has a unique character and personality. Moreover, he had pronounced ideas on what constituted the national spirit of his people and believed that it was profoundly different from the German spirit.

24. Similarly, in the United States Zionists raised a "storm of protest" when Judge Julian Mack of the American Jewish Committee testified before the Dillingham Commission on immigration in 1909 that Jews were not a race (Cohen 1972, 47). Szajowski (1967, 7) cites the following statement by Lucien Wolf, secretary of the Conjoint Foreign Committee of the Board of Deputies and the Anglo-Jewish Association, as typical of Jewish leaders of the period, including Jacob Schiff of the American Jewish Committee and Dr. Paul Nathan, leader of the German Hilfsverein der deutschen Juden: "I, too, am for assimilation, but I want it mechanical and not chemical. I want the race preserved but the spirit merged." Goldstein (1997) shows that American Jews in the late 19th century commonly identified themselves as a racial group, at least partly as an image-management strategy (see Chapter 7).

25. Theilhaber is interesting because of his deep concern with Jewish fertility and at the same time with developing organizations that would facilitate abortion and birth control among gentile Germans. Theilhaber was very concerned about the declining Jewish birth rate and was

politically active in attempting to increase Jewish fertility (going so far as to propose to tax "child-poor" families to support "child-rich" families). At the same time, he was also instrumental in creation of the Gesellschaft für Sexualreform, whose aims were to legalize abortion and make contraceptives available to the German public (Efron 1994, 142, 144, 152). As indicated below, the National Socialists encouraged fertility and enacted laws that restricted abortion and discouraged birth control.

26. Zollschan comments on the light pigmentation to be found in all Jewish groups despite the predominance of dark pigmentation. The fin de siècle race scientists made some interesting speculations on the origins of blond hair and blue eyes among Jews. The German Felix von Luschan proposed that the ancient Jews had intermarried with the non-Semitic Hittites and the blond Amorites. The Jewish racial scientist Elias Auerbach rejected this idea because it conflicted with the abhorrence of exogamy that is so apparent in the Tanakli. He proposed that when Jews settled in lands with a high percentage of blondes they have an unconscious preference to marry blondes in their own group, so that there is selection in the diaspora environment for phenotypic resemblance to the non-Jewish population (see Efron 1994, 139-140). The German Fritz Lenz (1931, 667- 668) (a professor of "racial hygiene" in the National Socialist era) made a proposal similar to that of Auerbach.

27. In *Jews in the Modern World*, Ruppin (1934) asserts that Jews are not a racially pure group, because of widespread intermarriage and illicit sexual relationships in the diaspora. Nevertheless, he describes three "racial types" of Jews, one (the Oriental Jews) genetically identical to the ancient Jews, and two others (Sephardic and Ashkenazic) resulting from an influx of gentile genes in the diaspora. Although these racial types are not racially pure, because they originated as a result of cross-breeding, they represent racial types because they have been genetically isolated for centuries in particular areas. Ruppin therefore conceptualizes the Ashkenazic and Sephardic Jewish populations as originating from a high level of cross-breeding followed by prolonged periods of genetic isolation, with the result that contemporary Jewish populations have a high degree of genetic homogeneity and phenotypic resemblance. In a section entitled "Disruptive Forces in Jewry," Ruppin decries the assimilative forces of modern societies, including the decline of religious belief and family ties, and the weakening of a sense of common fate among Jews. Intermarriage marks the end of Judaism. Mixed marriage is regarded as destructive of Judaism even where the non-Jewish side adopts the Jewish religion, for it is understood, be it merely subconsciously, that Judaism is something more than a religion—a common descent and a common fate. Were it only a religious communion, assimilated Jews would actually have to welcome a mixed marriage which gains a proselyte for Judaism, but even among them this view is conspicuously absent. (p. 318) Ruppin also regretted that "the feeling of unity resulting from consanguinity [inbreeding] is being lost" (p. 277). Ruppin himself married his first cousin, suggesting he also placed a high value on the common Jewish practice of consanguineous marriage, which has resulted in relatively high levels of genetic relatedness within historical Jewish societies (see PTSDA, Ch. 4).

28. While Ruppin stated that "other nations may have points of superiority" (1913, 217), he countenanced rather negative views of Germans. In his introduction to Ruppin's (1934) book, the prominent historian Sir Louis B. Namier (1934, xx-xxi) presented the following view of Germans: "The German is methodical, crude, constructive mainly in the mechanical sense, extremely submissive to authority, a rebel or a fighter only by order from above; he gladly remains all his life a tiny cog in a machine." He goes on to refer to German "political and social ineptitude." As expected by social identity theory, positive attributions regarding one's ingroup tend to be associated with negative evaluations of the outgroup.

29. Buber's close friend Gustav Landauer developed similar ideas, in which "the individual . . . rediscovers the community to which he is linked through his blood and learns that he is merely an 'electric spark' in a larger unity" (Mosse 1970, 91). Nevertheless, the Jewish God was the God of all humanity, implying some sort of coexistence of different peoples. As noted in Chapter 7, Buber and Landauer argued that Jewish pursuit of their ethnic interests was in the service of all mankind. As Mosse (1970, 89) notes in his comments on Buber and another Jewish Volkische thinker, Robert Weltsch, "only by first becoming a member of the Volk could the individual Jew truly become part of humanity." Mosse comments that it is not at all clear how this Jewish Volkische ideology would be compatible with the idea that all of humanity would "flow together," but the attitude was typical of many Zionists of the period. In my terms, such ideologies are examples of rationalization, deception and/or self-deception that have been typical of Jewish theories of Judaism throughout history (see Chapters 7 and 8).

30. "Dr. Wise Urges Jews to Declare Selves as Such," New York Herald Tribune, June 13, 1938, 12.

31. Niewyk also includes among the liberal Jewish voices the novelists Georg Hermann and Kurt Milnzer, both of whom believed that racial differences divided Jews and Germans. In attempting to understand Jewish uniqueness, another liberal, Rabbi Caesar Seligmann of Frankfurt-am-Main, attributed it to "Jewish sentiment, the instinctive, call it what you will, call it the community of blood, call it tribal consciousness, call it the ethnic soul, but best of all call it: the Jewish heart" (in Niewyk 1980, 106).

32. Graetz's work is replete with ingroup glorification and denigration of outgroups. While other nations had sunk into debauchery and violence, the Jews had remained true to their historical mission: "In the midst of a debauched and sinful world and amid vices with which, in its beginnings, the Jews were also infected, they yet freed themselves, they raised on high an exalted standard of moral purity, and thus formed a striking contrast to other nations" (Graetz 1898, VI, 706). Their allegiance to high moral standards required them to separate themselves entirely from the "heathen world" (p. 721)- a common rationalization for Jewish separatism (see Chapter 7).

33. This Jewish intellectual racialism among psychoanalysts was highly compatible with a firm

commitment to Jewish group continuity. Indeed, Klein (1981) notes that Freud passionately implored his associate Max Graf not to abandon his Jewish commitment by baptizing his son. A theme of *The Culture of Critique* is that a major component of Jewish intellectual movements in the 20th century has been a commitment to messianic universalist movements, which propose to lead humanity to a higher moral plane while nevertheless retaining Jewish group continuity. These movements are thus compatible with continued genetic segregation between Jews and gentiles and continued group-based resource competition between Jews and gentiles.

34. Before their rupture, Jung is described as a "strong independent personality, as a Teuton" (in Gay 1988, 201). After Jung was made head of the International Psychoanalytic Association, a colleague of Freud was concerned because, "taken as a race," Jung and his gentile colleagues were "completely different from us Viennese" (in Gay 1988, 219). In 1908 Freud wrote a letter to the psychoanalyst Karl Abraham in which Abraham is described as keen, while Jung is described as having a great deal of elan-which, as Yerushalmi (1991, 43) notes, indicates a tendency to stereotype individuals on the basis of group membership (the intellectually sharp Jew and the energetic Aryan). Freud's sense of Jewish superiority can also be seen in his statement that "ruthless egoism" is more characteristic of gentiles than of Jews, while Jewish family life and intellectual life are superior. Freud pointed to Jewish achievement in the arts and sciences to support his claim that Jews were superior (see Cuddihy 1974, 36). Further, Freud viewed these differences as unchangeable. In a 1933 letter Freud decried the upsurge in anti-Semitism, stating that "my judgment of human nature, especially the Christian-Aryan variety, has had little reason to change" (in Yerushalmi 1991, 48). Nor, in Freud's opinion, would the Jewish character change. In *Moses and Monotheism*, Freud (1939, 51 n) states that "it is historically certain that the Jewish type was finally fixed as a result of the reforms of Ezra and Nehemiah in the fifth century before Christ." As Yerushalmi (1991, 52) notes, "Freud was thoroughly convinced that once the Jewish character was created in ancient times it had remained constant, immutable, its quintessential qualities indelible." Viewed in this manner the obvious racialism and the clear statement of Jewish ethical, spiritual, and intellectual superiority contained in Freud's last work, *Moses and Monotheism*, must be seen not as an aberration of Freud's thinking but as central to his attitudes, if not his published work dating from a much earlier period. These issues are discussed more fully in *The Culture of Critique*. Here they merely serve as an indication of the deeply held racist views of individuals on both sides of the ethnic divide during the period.

35. As discussed by Yerushalmi (1991, 46), in 1921 Wilhelm Dolles published a book *Das Jüdische als Geistesrichtung* [The Jewish and the Christian as Spiritual Direction] which argued that Jews were attracted to psychoanalysis because they had a "hysterical" character because they had striven throughout their history for unattainable goals. Dolles did not reject psychoanalysis but advocated a different form of psychoanalysis for Christians, such as that of Jung, more attuned to the morally superior Christian character.

36. Yerushalmi (1991, 54) also notes that Ernest Jones, a self-described "Shabbes-goy among the

Viennese" and someone whose worshipful compliance made him very useful to psychoanalysis as a Jewish ethnic movement, also had the view that Jews had certain physical features that caused gentiles to have unconscious hostility toward them.

37. After becoming a refugee, Arendt lived her life in an almost exclusively Jewish milieu, working for a Jewish refugee relief organization, for Jewish Cultural Reconstruction, Inc., and for a publisher of Judaica, Schocken Books. Her theory of anti-Semitism, as expressed in *The Origins of Totalitarianism*, like many other theories of anti-Semitism developed by Jewish intellectuals such as those discussed in *The Culture of Critique*, provides no role for resource competition between impermeable ethnic groups. Katz (1983, 83) presents Arendt as an example of a theorist of anti-Semitism who unrealistically and apologetically ignores the contribution of Jewish behavior to anti-Semitism.

38. The Nethinim were members of a foreign ethnic group living as slaves in ancient Israelite society and thought to be descendants of the peoples displaced by the Israelites in the post-Exodus conquest. As indicated in PTSDA (Chs. 3 and 4), the Samaritans were excluded by the Israelites in the post-Exilic period because of their doubtful racial purity.

39. Interestingly, when de LaGarde visited England in the 1850s, he was very favorably impressed by the unity of the people, the popularity of the monarchy, and the responsible behavior of the aristocracy (Stern 1961, 54). Whether or not he was correct in his judgment, it may well be the case that the muted forms of individualism that have characterized several prototypical Western societies depend for their success on high levels of social consensus and on social or legal constraints on the individualistic behavior of elites.

Race and Crime: An International Dilemma

By Rushton, J. Philippe

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In their magisterial *Crime and Human Nature*, J.Q. Wilson and R.J. Herrnstein noted that the Asian underrepresentation in U.S. crime statistics posed a theoretical problem. The solution proposed by criminologists as early as the 1920s was that the Asian "ghetto" protected members from the disruptive tendencies of the outside society. For blacks, however, the ghetto is said to foster crime.

The overrepresentation of blacks in U.S. crime statistics has existed since the turn of the twentieth century. The census of 1910 showed more blacks than whites in jail, in the north as well as in the south. Official figures from the 1930s through the 1950s showed that the number of blacks arrested for crimes of violence in proportion to the number of whites ranged from 6:1 to 16:1. These statistics have not improved in the interim.

Breaching a long taboo, liberals from Bill Clinton to Jesse Jackson have recently made it respectable to theorize about "black-on-black" crime. Conservative magazines like the *National Review* have also begun to discuss aspects of the race/crime link (see "Blacks... and Crime," May 16, 1994; "How to Cut Crime," May 30, 1994). What is yet to be acknowledged, however, is the international generalizability of the race/crime relationship. The matrix found within the United States, with Asians being most law-abiding, Africans least, and Europeans intermediate, is to be observed in other multiracial countries like Britain, Brazil, and Canada. Moreover, the pattern is revealed in China and the Pacific Rim, Europe and the Middle East, and Africa and the Caribbean. Because the "American dilemma" is global in manifestation, explanations must go well beyond U.S. particulars.

I emphasize at the outset that enormous variability exists within each of the populations on many of the traits to be discussed. Because distributions substantially overlap, with average differences amounting to between 4 and 34 percent, it is highly problematic to generalize from a group average to a particular individual. Nonetheless, as I hope to show, significant racial variation exists, not only in crime but also in other traits that predispose to crime, including testosterone, brain size, temperament, and cognitive ability.

The global nature of the racial pattern in crime is shown in data collated from INTERPOL using the 1984 and 1986 yearbooks. After analyzing information on nearly 100 countries, I reported, in the 1990 issue of the *Canadian Journal of Criminology*, that African and Caribbean countries had double the rate of violent crime (an aggregate of murder, rape, and serious assault) than did European countries, and three times more than did countries in the Pacific Rim. Averaging over

the three crimes and two time periods, the figures per 100,000 population were, respectively, 142, 74, and 43.

I have corroborated these results using the most recent INTERPOL yearbook (1990). The rates of murder, rape, and serious assault per 100,000 population reported for 23 predominantly African countries, 41 Caucasian countries, and 12 Asian countries were: for murder, 13, 5, and 3; for rape, 17, 6, and 3; and for serious assault, 213, 63, and 27. Summing the crimes gave figures per 100,000, respectively, of 243, 74, and 33. The gradient remained robust over contrasts of racially homogeneous countries in northeast Asia, central Europe, and sub-Saharan Africa, or of racially mixed but predominantly black or white/Amerindian countries in the Caribbean and Central America. In short, a stubborn pattern exists worldwide that requires explanation. Testosterone and the Family The breakdown of the black family and the strengths of the Asian family are often used to explain the crime pattern within the United States. Learning to follow rules is thought to depend on family socialization. Since the 1965 Moynihan Report documented the high rates of marital dissolution, frequent heading of families by women, and numerous illegitimate births, the figures cited as evidence for the instability of the black family in America have tripled.

A similarly constituted matrifocal black family exists in the Caribbean with father-absent households, lack of paternal certainty, and separate bookkeeping by spouses. The Caribbean pattern, like the American one, is typically attributed to the long legacy of slavery. However, the slavery hypothesis does not fit data from sub-Saharan Africa. After reviewing long-standing African marriage systems in the 1989 issue of *Ethology and Sociobiology*, anthropologist Patricia Draper of Pennsylvania State University concluded: "coupled with low investment parenting is a mating pattern that permits early sexual activity, loose economic and emotional ties between spouses... and in many cases the expectation on the part of both spouses that the marriage will end in divorce or separation, followed by the formation of another union."

The African marriage system may partly depend on traits of temperament. Biological variables such as the sex hormone testosterone are implicated in the tendency toward multiple relationships as well as the tendency to commit crime. One study, published in the 1993 issue of *Criminology* by Alan Booth and D. Wayne Osgood, showed clear evidence of a testosterone-crime link based on an analysis of 4,462 U.S. military personnel. Other studies have linked testosterone to an aggressive and impulsive personality, to a lack of empathy, and to sexual behavior. Testosterone levels explain why young men are disproportionately represented in crime statistics relative to young women, and why younger people are more trouble-prone than older people. Testosterone reliably differentiates the sexes and is known to decline with age. Ethnic differences exist in average level of testosterone. Studies show 3 to 19 percent more testosterone in black college students and military veterans than in their white counterparts. Studies among the Japanese show a correspondingly lower amount of testosterone than among white Americans. Medical research has focused on cancer of the prostate, one determinant of which is testosterone. Black men have higher rates of prostate cancer than do white men who in

turn have higher rates than do Oriental men.

Sex hormones also influence reproductive physiology. Whereas the average woman produces 1 egg every 28 days in the middle of the menstrual cycle, some women have shorter cycles and others produce more than one egg; both events translate into greater fecundity including the birth of dizygotic (two-egg) twins. Black women average shorter menstrual cycles than white women and produce a greater frequency of dizygotic twins. The rate per 1,000 births is less than 4 among east Asians, 8 among whites, and 16 or greater among Africans and African-Americans.

Racial differences exist in sexual behavior, as documented by numerous surveys including those carried out by the World Health Organization. Africans, African-Americans and blacks living in Britain are more sexually active, at an earlier age, and with more sexual partners than are Europeans and white Americans, who in turn are more sexually active, at an earlier age, and with more sexual partners than are Asians, Asian-Americans, and Asians living in Britain. Differences in sexual activity translate into consequences. Teenage fertility rates around the world show the racial gradient, as does the pattern of sexually transmitted diseases. World Health Organization Technical Reports and other studies examining the worldwide prevalence of AIDS, syphilis, gonorrhea, herpes, and chlamydia typically find low levels in China and Japan and high levels in Africa, with European countries intermediate. This is also the pattern found within the United States.

International data on personality and temperament show that blacks are less restrained and less quiescent than whites and whites are less restrained and less quiescent than Orientals. With infants and young children observer ratings are the main method employed, whereas with adults the use of standardized tests are more frequent. One study in French-language Quebec examined 825 four- to six-year olds from 66 countries rated by 50 teachers. All the children were in preschool French-language immersion classes for immigrant children. Teachers consistently reported better social adjustment and less hostility-aggression from east Asian than from white than from African-Caribbean children. Another study based on twenty-five countries from around the world showed that east Asians were less extraverted and more anxiety-prone than Europeans who in turn were less outgoing and more restrained than Africans.

Behavior Genetics

Differences between individuals in testosterone and its various metabolites are about 50 percent heritable. More surprising to many are the studies suggesting that criminal tendencies are also heritable. According to American, Danish, and Swedish adoption studies, children who were adopted in infancy were at greater risk for criminal convictions if their biological parents had been convicted than if the adopting parents who raised them had been convicted. In one study of all 14,427 nonfamilial adoptions in Denmark from 1924 to 1947, it was found that siblings

and half-siblings adopted separately into different homes were concordant for convictions. Convergent with this adoption work, twin studies find that identical twins are roughly twice as much alike in their criminal behavior as fraternal twins. In 1986 I reported the results of a study of 576 pairs of adult twins on dispositions to altruism, empathy, nurturance, and aggressiveness, traits which parents are expected to socialize heavily. Yet 50 percent of the variance in both men and women was attributable to genetics. The well-known Minnesota Study of Twins Raised Apart led by Thomas J. Bouchard, Jr., has confirmed the importance of genetic factors to personality traits such as aggressiveness, dominance, and impulsivity. David Rowe at the University of Arizona reviewed much of this literature in his 1994 book *Limits of Family Influence*. He explains how siblings raised together in the same family may differ genetically from each other in delinquency.

Genes code for enzymes, which, under the influence of the environment, lay down tracts in the brains and neurohormonal systems of individuals, thus affecting people's minds and the choices they make about behavioral alternatives. In regard to aggression, for example, people inherit nervous systems that dispose them to anger, irritability, impulsivity, and a lack of conditionability. In general, these factors influence self-control, a psychological variable figuring prominently in theories of criminal behavior.

Behavior genetic studies provide information about environmental effects. As described in Rowe's book, the important variables turn out to be within a family, not between families. Factors such as social class, family religion, parental values, and child-rearing styles are not found to have a strong common effect on siblings. Because individual minds channel common environments in separate ways siblings acquire alternative sets of information. Although siblings resemble each other in their exposure to violent television programs, it is the more aggressive one who identifies with aggressive characters and who views aggressive consequences as positive.

Within-family studies show that intelligence and temperament separate siblings in proneness to delinquency. It is not difficult to imagine how an intellectually less able and temperamentally more impulsive sibling seeks out a social environment different from his or her more able and less impulsive sibling. Within the constraints allowed by the total spectrum of cultural alternatives, people create environments maximally compatible with their genotypes. Genetic similarity explains the tendency for trouble-prone personalities to seek each other out for friendship and marriage. One objection sometimes made to genetic theories of crime is the finding that crime rates fluctuate with social conditions. Generational changes in crime, however, are expected by genetic theories. As environments become less impeding and more equal, the genetic contribution to individual difference variation necessarily becomes larger. Over the last 50 years, for example, there has been an increase in the genetic contribution to both academic attainment and longevity as harmful environmental effects have been mitigated and more equal opportunities created. Thus, easing social constraints on underlying "at risk" genotypes leads to an increase in criminal behavior.

Intelligence

The role of low cognitive ability in disposing a child to delinquency is established even within the same family where a less able sibling is observed to engage in more deviant behavior than an advantaged sibling. Problem behaviors begin early in life and manifest themselves as an unwillingness or inability to follow family rules. Later, drug abuse, early onset of sexual activity, and more clearly defined illegal acts make up the broad-based syndrome predicted by low intelligence.

Racial differences exist in average IQ-test scores and again the pattern extends well beyond the United States. The global literature on IQ was reviewed by Richard Lynn in the 1991 issue of *Mankind Quarterly*. Caucasoids of North America, Europe, and Australasia generally obtained mean IQs of around 100. Mongoloids from both North America and the Pacific Rim obtained slightly higher means, in the range of 101 to 111. Africans from south of the Sahara, African-Americans, and African-Caribbeans (including those living in Britain) obtained mean IQs ranging from 70 to 90.

The question remains of whether test scores are valid measures of group differences in mental ability. Basically, the answer hinges on whether the tests are culture-bound. Doubts linger in many quarters, although a large body of technical work has disposed of this problem among those with psychometric expertise, as shown in the book of surveys by Snyderman and Rothman. This is because the tests show similar patterns of internal item consistency and predictive validity for all groups, and the same differences are to be found on relatively culture-free tests.

Novel data about speed of decision making show that the racial differences in mental ability are pervasive. Cross-cultural investigations of reaction times have been done on nine- to twelve-year olds from six countries. In these elementary tasks, children must decide which of several lights is on, or stands out from others, and move a hand to press a button. All children can perform the tasks in less than one second, but more intelligent children, as measured by traditional IQ tests, perform the task faster than do less intelligent children. Richard Lynn found Oriental children from Hong Kong and Japan to be faster in decision time than white children from Britain and Ireland who were faster than black children from Africa. Arthur Jensen has reported the same three-way pattern in California.

Brain Size

The relation between mental ability and brain size has been established in studies using magnetic resonance imaging, which, in vivo, construct three-dimensional pictures of the brain and confirm correlations reported since the turn of the century measuring head perimeter. The brain size/cognitive ability correlations range from about 0.10 to 0.40. Moreover, racial

differences are found in brain size. It has often been held that racial differences in brain size, established in the nineteenth century, disappear when corrections are made for body size and other variables such as bias. However, modern studies confirm nineteenth-century findings.

Three main procedures have been used to estimate brain size: (a) weighing wet brains at autopsy; (b) measuring the volume of empty skulls using filler; and (c) measuring external head size and estimating volume. Data from all three sources triangulate on the conclusion that, after statistical corrections are made for body size, east Asians average about 17 c[m.sup.3] (1 cubic inch) more cranial capacity than whites who average about 80 c[m.sup.3] (5 cubic inches) more than blacks. Ho and colleagues at the Medical College of Wisconsin analyzed brain autopsy data on 1,261 American subjects aged 25 to 80 after excluding obviously damaged brains and reported, in the 1980 issue of *Archives of Pathology and Laboratory Medicine*, that, after controlling for age and body size, white men averaged 100 grams more brain weight than black men, and white women averaged 100 grams more brain weight than black women. With endocranial volume, Beals and colleagues computerized the world database of up to 20,000 crania and published their results in the 1984 issue of *Current Anthropology*. Sex-combined brain cases differed by continental area with populations from Asia averaging 1,415 c[m.sup.3], those from Europe averaging 1,362 c[m.sup.3], and those from Africa averaging 1,268 c[m.sup.3].

Using external head measurements I have found, after corrections are made for body size, that east Asians consistently average a larger brain than do Caucasians or Africans. Three of these studies were published in the journal *Intelligence*. In a 1991 study, from data compiled by the U.S. space agency NASA, military samples from Asia averaged 14 c[m.sup.3] more cranial capacity than those from Europe. In a stratified random sample of 6,325 U.S. Army personnel measured in 1988 for fitting helmets, I found that Asian-Americans averaged 36 c[m.sup.3] more than European-Americans who averaged 21 c[m.sup.3] more than African-Americans. Most recently, I analyzed data from tens of thousands of men and women aged 25 to 45 collated by the International Labour Office in Geneva and found that Asians averaged 10 c[m.sup.3] more than Europeans and 66 c[m.sup.3] more than Africans.

Racial differences in brain size and IQ show up early in life. Data from the National Collaborative Perinatal Project on 19,000 black children and 17,000 white children show that black children have a smaller head perimeter at birth and, although they are born shorter in stature and lighter in weight, by age seven "catch-up growth" leads them to be larger in body size than white children, but still smaller in head perimeter. Head perimeter at birth correlated with IQ at age seven in both the black and the white children.

Origins of Race Differences

Racial differences exist at a more profound level than is normally considered. Why do Europeans average so consistently between Africans and Asians in crime, family system, sexual

behavior, testosterone level, intelligence, and brain size? It is almost certain that genetics and evolution have a role to play. Transracial adoption studies indicate genetic influence. Studies of Korean and Vietnamese children adopted into white American and white Belgian homes showed that, although as babies many had been hospitalized for malnutrition, they grew to excel in academic ability with IQs ten points higher than their adoptive national norms. By contrast, Sandra Scarr and her colleagues at Minnesota found that at age 17, black and mixed-race children adopted into white middle-class families performed at a lower level than the white siblings with whom they were raised. Adopted white children had an average IQ of 106, an average aptitude based on national norms at the 59th percentile, and a class rank at the 54th percentile; mixed-race children had an average IQ of 99, an aptitude at the 53rd percentile, and a class rank at the 40th percentile; and black children had an average IQ of 89, an aptitude at the 42nd percentile, and a class rank at the 36th percentile.

No known environmental variable can explain the inverse relation across the three races between gamete production (two-egg twinning) and brain size. The only known explanation for this trade-off is life-history theory. A life-history is a genetically organized suite of characters that evolved in a coordinated manner so as to allocate energy to survival, growth, and reproduction. There is, in short, a trade-off between parental effort, including paternal investment, and mating effort, a distinction Patricia Draper referred to as one between "cads" and "dads."

Evolutionary hypotheses have been made for why Asians have the largest brains and the most parenting investment strategy. The currently accepted view of human origins, the "African Eve" theory, posits a beginning in Africa some 200,000 years ago, an exodus through the Middle East with an African/non-African split about 110,000 years ago, and a Caucasoid/Mongoloid split about 40,000 years ago. Evolutionary selection pressures are different in the hot savanna where Africans evolved than in the cold arctic where Asians evolved.

The evidence shows that the further north the populations migrated out of Africa, the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children successfully during prolonged winters. The evolutionary sequence fits with and helps to explain how and why the variables cluster. As the original African populations evolved into Caucasoids and Mongoloids, they did so in the direction of larger brains and lower levels of sex hormone, with concomitant reductions in aggression and sexual potency and increases in forward planning and family stability.

Despite the vast body of evidence now accumulating for important genetic and behavioral differences among the three great macro-races, there is much reluctance to accept that the differences in crime are deeply rooted. Perhaps one must sympathize with fears aroused by race research. But all theories of human nature can be used to generate abusive policies. And a rejection of the genetic basis for racial variation in behavior is not only poor scholarship, it may be injurious to unique individuals and to complexly structured societies. Moreover, it should be

emphasized that probably no more than about 50 percent of the variance among races is genetic, with the remaining 50 percent due to the environment. Even genetic effects are necessarily mediated by neuroendocrine and psychosocial mechanisms, thus allowing opportunity for benign intervention and the alleviation of suffering.

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Discrimination and Differentiation: An Ethical Biological Issue

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This paper discusses the ethical and biological implications of the concept of discrimination. The author perceives freedom of speech and action as endangered by prevailing anti-discrimination laws and notes that certain of these run counter to sociobiological reality.

According to the Oxford English Dictionary, discrimination is defined as "the act of discriminating or distinguishing; a distinction (made with the mind or in action); the power of observing differences accurately, or to making exact distinctions." This traditional definition is relatively value neutral, and permitted the word to be used in favorable, as well as negative, contexts. Indeed, to have called a man or woman a discriminating person was traditionally considered a high compliment to a person's judgment, discretion, or taste.

By a kind of linguistic Gresham's Law, however, the verbal equivalent of base metal has driven the verbal equivalent of gold coinage out of circulation. Since the mid-1950s in America, the word "discrimination" has come to acquire an exclusively negative shading because of its politically loaded use as a term of condemnation. Discrimination has quickly acquired the following meaning: unfair and reprehensible behavior towards a representative of a given race, religion, ethnic group, sex, or behavioral dysfunction (e.g., homosexuality). Latterly, it has been regarded as invidious and legally actionable for a citizen to even notice or comment upon the distinguishing characteristics of some offended group, even if no unfair action follows.

This new meaning of the word discrimination has spread internationally in parallel with the current Western ideological movement to compel the belief that all the races of mankind are identical. In some languages, the introduction of the word "discrimination" to other languages has resulted in linguistic monstrosities. While in English one discriminates in favor of or against something, in German the word has acquired a transitive usage as seen in the following example of the results of a playground quarrel: "Mutti, er hat mich diskriminiert!"

Free Speech: One of the First Casualties

Amusing as such solecisms are, it is a fact that in virtually all industrialized Western societies discrimination as recently defined is regarded with official opprobrium, and large sums of tax money are spent to root it out and criminalize transgressors. Indeed, Canada has surpassed the United States in this respect, as there have already been cases of individuals whose writings have been suppressed because they were considered discriminatory. Whether in Canada, America, or Britain, combatting discrimination has come to be a major function of government. Commissions are established, laws and regulations are promulgated, employees are enrolled in compulsory lectures, private businesses are obliged to certify nondiscrimination, and

government security clearances can be withheld on the basis of hearsay testimony regarding an individual's alleged discriminatory remarks.

Before we consider the long-run implications of such policy enforcement, however, I would like to draw the reader's attention back to the original meaning of discrimination, and examine it as an adaptive behavior in human beings. As the Oxford dictionary definition makes clear, discrimination is actually the cognitive ability to differentiate. While this capacity may be very rudimentary in the lower orders of fauna, such as insects, as we ascend the phylogenetic scale, life becomes more complex and its ability to survive depends on simple judgments based on the ability to perceive differences. Is the creature of my own species who is approaching me friend or foe? Is that animal dangerous or tame? Is this plant poisonous or edible? Distinctions of this sort are ludicrously simple, but they form the experiential data base of any creature that expects to survive and propagate. Internalized, these distinctions become prejudices, i.e., mnemonic devices that help sentient creatures cope with unfamiliar situations. The human species, in the absence of tropism and instinct, requires the ability to differentiate.

An increasing sophistication in roles and diversity of skills in human societies came with the development of a sophisticated capacity to differentiate experience. Within individual communities there arose the separation of individual members according to roles and duties. This process is essentially the same as the free market notion of specialization of labor; the surpluses created by specialization of function permitted not only material abundance, but the development of a higher level of culture. Culture is always dependent on the perception of members of the human species as differentiated individuals, rather than as reflexive components of a group. It is the achievement of individual identity which marks the dawn of *Homo sapiens*.

With the acquisition of sapiency and culture, mankind developed religion and religion-derived systems of ethical conduct. A distinguishing feature of every known religion and ethical system has been the construction of a hierarchy of values. It would be a metaphysical absurdity otherwise, for a religion or ethic without a scale of values would have no justification to exist. Characteristic of all moral systems, at least until the advent of existentialism and moral relativism in the twentieth century, has been a clear differentiation between good and evil.

Until the end of the eighteenth century, the principle that man was a sapient individual, responsible to a deity for his acts, was undisputed within the ambit of Western Civilization. The first crack in this value system appeared in the writings of the philosophers of the French Revolution, such as Rousseau and Robespierre. They were affronted by the existence of different classes and economic conditions within society, which could only be remedied by a radical levelling of the conditions of individual men and women within their republic of virtue. The revolutionaries' plans reveal not merely a desire to alleviate the burden of immemorial poverty, but a positive desire to erase any distinction between citizens for its own sake. Forcing the King to don the tricolor rosette and be addressed as citizen Capet could not conceivably enrich the nation, but it was seen as a positive virtue to eliminate the differences which

distinguish one man from his neighbor.

An Exercise in Income and Status Equalization

The modern movement to erase distinctions among human beings thus began largely as an exercise in income and status equalization among citizens within a nation. Throughout the nineteenth and twentieth centuries, this movement has acquired messianic legitimation through Marxist doctrine, and has increased in both intensity and geographic distribution to the point where laissez faire economics is only permitted in a handful of states on the Pacific Rim. The political collapse of the Leninist variant of Marxism does not seem likely to significantly delegitimize the world-wide movement toward income and status levelling; on the contrary, the creation of the "Single Europe", directed by a socialist-bureaucratic secretariat headquartered in Brussels, is likely to increase income redistribution in Western Europe while putting the brake on free market entrepreneurialism further east.

During the latter half of the twentieth century, social and economic levelling have been supplemented by a global political movement for racial homogenization. Since the mid-1940s at the latest (coincident with the founding of the United Nations), political elites have regarded those phenomena which distinguish the various racial taxa in a cultural sense - economic success, scientific achievement, and artistic tradition, among other traits - as obstacles to be removed through exhortation, education, and the force of law. According to the theories of anthropological relativism popularized by Franz Boas and Margaret Meade, since all cultures are ipso facto equal, the inequalities between groups are consequently false and meretricious, and can only be explained by other factors, such as the exploitation of one group by another. This twisted reasoning lies behind such political programs as the U.N.'s New Economic Order (NEO) - global income redistribution to favor those racial groups that are less advanced - the Genocide convention (which defines statements that could be construed as leading to "mental harm" to other races as genocidal acts meriting extradition and trial), and UNESCO's programs of cultural propaganda paid for by the taxpayers of the wealthier Western countries. Within the Western nations themselves, the governmental apparatuses have implemented a panoply of legal and regulative measures to eliminate distinctions between racial groups, such as hiring and representational quotas, "antidiscrimination" laws which weaken property rights, and various measures designed to suppress speech which might draw attention to racial differences. Even more pervasive than the legal measures, however, has been the more-or-less unofficial practice of social coercion. While certain forms of speech touching on racial, ethnic, and related distinctions are not formally proscribed, injudicious remarks will usually result in pressure by organized groups to remove the offending individual from his place of employment; image-conscious corporations, anxious to avoid guilt by association, usually comply with demands of the aggrieved minority.

By this process, the First Amendment to the Constitution, which employ to legitimize various forms of non-verbal behavior (such as pornography and flag-burning) as "protected speech," has

ironically become a dead letter for many traditional words and forms of speech currently ostracized by the antidiscrimination movement. The career paths of James Watt, Jimmy "the Greek" Snyder, Jackie Mason, and Andy Rooney are illustrative of this phenomenon.

"The Hate Crimes Statistics Act"

However, these informal persecutions are likely to gain the force of law before the year 2000 in America. Not only is there ample legal precedent in other Western countries, but recent legislative initiatives suggest that organized social coercion by the antidiscrimination movement will eventually be supplemented by a broad range of civil and criminal penalties. In February, the U.S. Senate passed legislation emotively titled "The Hate Crimes Statistics Act". This bill seeks to encourage the Justice Department to pass judgment on whether certain crimes, misdemeanors, and civilly actionable behaviors are motivated by racial, ethnic or anti-homosexual "hate." Not only does this bill thereby involve the federal government in law enforcement activities that were previously the domain of state and local authorities, it also implicitly attempts to redefine common sense concepts of "crime." If injudicious speech is motivated by "hate," is the commission of robbery and murder by a professional criminal (which falls outside the penumbra of the bill) considered a lesser act because it was presumably motivated by desire for economic gain? On the other hand, is the American criminal class not motivated, at least in part, by hatred of normal members of society? To read the legislation, one would have to conclude otherwise.

The average middle class American might venture surprise that the political elites would regard rude language towards a homosexual as a more serious "crime" than murder, since the former merits urgent federal attention and the latter does not. But that is precisely the tendency of American political elites, whose membership is largely composed of the antidiscrimination movement. It is noteworthy that President Bush's proposed Omnibus Anticrime Act (which attempts to deal with the sorts of crime that most Americans encounter) has not received a favorable review from Congress.

It is also worth noting a feature of the Hate Crimes bill which implies a melding of government and private activist groups. A provision of the bill exhorts the Justice Department to "coordinate" its statistics gathering activities with such quasi-private groups as the B'nai B'rith and the NAACP. This statute suggests therefore that agencies of a popularly elected government are either technically incompetent or insufficiently zealous to properly carry out the law on their own. By omission, also, the bill insinuates that the average unaffiliated citizen's views on what constitutes hate do not carry the same weight as those of the abovementioned groups. The implication that a sanhedrin of private groups is required to pass judgment on law enforcement matters suggests that within a few years the socially coercive powers of private "antidiscrimination groups" will be fused with the executive and judicial power of government.

The Civil Rights bill, which was killed by President Bush but which will likely be resurrected in

essentially similar form, would make civilly liable those employers who cannot prove in court that the qualifications for employment they have established are "essential" for the job description. In other words, the plaintiff would not have to prove discrimination in order to receive a judgment; while the defendant must not only prove that no discrimination took place, but also that the stated qualifications for the job (e.g., a university degree or tangible experience in the field) are not merely "reasonable" but essential. Aside from the chilling implication that the shift of the burden of proof from the plaintiff to the defendant has for the protection of Constitutional rights, this bill marvelously illustrates the unstated philosophy behind the antidiscrimination movement that has persisted since Rousseau: the refusal to make reasonable distinctions, and the desire to force others to desist from making such distinctions.

Discrimination is a Natural Process

The common denominator among all antidiscrimination movements, whether they are concerned with skin color, income, sex, individual ability, or dysfunctional behaviors, is that they resolutely refuse to honor traditional common sense distinctions that have helped keep societies on an even keel. They object to sodomy laws, for instance, on the grounds that such laws "discriminate" against homosexuals. But that is precisely the point: the need to protect society (and its children) against the kind of dysfunctional behavior which spreads disease and social dissolution. Vagrancy laws "discriminate" against vagrants. Laws to institutionalize the insane "discriminate" against the insane, and so on. Of course, when a society no longer discriminates against the insane by institutionalizing them, it ends up with more vagrants.

This litany of folly is virtually endless. The death penalty "discriminates" against those groups of people from whose ranks most murderers are drawn. Intelligence tests "discriminate" against those with lesser intelligence. English grammar "discriminates" against women. Western culture "discriminates" against all that is not Western culture. A set of stairs "discriminates" against the physically disabled. Airline safety regulations "discriminate" against the blind. Private clubs "discriminate" because they are not public clubs, i.e., open to everybody. This process leads to a startling conclusion: if something is true to its original intent or definition it is ipso facto discriminatory, because it is a set which does not intersect with all other sets. A man is discriminatory because he is not a woman; QED.

This paradigm, if allowed to control all aspects of society, may eventually lead to the breakdown of society itself, because the society which accepts this paradigm will not only be unable to defend its institutions philosophically, but physically as well. In the 1960s and 70s, police forces abolished height and weight requirements for police officer candidates because these qualifications "discriminated" against women. As a result, police departments must not only accept understrength women but puny men as well. Unfortunately for society, such physical specimens in police uniform are not only less able to defend themselves in a violent confrontation, their unimposing appearance means they are less able to deter violence by their very presence. A recent incident in Mansfield, Ohio, is a revealing case in point. Two prisoners

being arraigned were reported to have overpowered an armed woman police officer, leading to a hostage situation.

However, the public report attempted to conceal the gravity of the situation by distorting the truth. In fact, the two felons overpowered four armed female officers and relieved them of their sidearms. The press, by covering up the truth in its efforts to avoid hurting people's feelings, is misleading the citizenry about the danger to public safety posed by misguided social engineering.

The quality of the police forces is being further eroded by requirements that entrance examinations be "normed" (i.e. fudged) downward so as to permit unrestricted hiring of various racial and ethnic minorities. As older cohorts of police officers reach retirement age, therefore, police forces across the country will have to face the fact that their personnel will increasingly consist of individuals who are either physically or mentally unfit by traditional standards. One cannot overestimate the danger to public safety that such a transformation in law enforcement will portend, but it will be extremely difficult to counter the anti-discrimination paradigm, which dictates levelling of standards and refusal to make common sense distinctions.

The standard that there shall be no standard is invading other fields critical to health, safety, and national survival. Traditionally, a fireman has required exceptional physical strength to perform the duties necessary to protect the public. The ability to carry an unconscious man weighing upwards of 200 pounds through a window and down a ladder is a punishing requirement - but it is the whole point of fire fighting. Again, however, standards have been "normed" so that physically weaker women can meet them. While the social effects of this policy may not be felt for some time, within a generation it is bound to dilute the effectiveness of another public service.

The most recent cause célèbre of the antidiscrimination movement has been the effort to abolish the combat exclusion rule in the military. The movement is challenging one of the most ancient social taboos of all, the principle that women should not fight in wars. There are many profound socio-biological implications to the overthrowing of this taboo, such as the social coarsening of women (who, according to George Gilder, are the true custodians of culture), the physical endangerment of society's childbearers, and the breaking down, in the enemy's mind, of the distinction between combatants and noncombatants.

Women in Combat

Leaving these issues aside for a moment, one should focus more closely on a far simpler and more quantifiable factor: combat effectiveness. Although proponents of women in combat consistently evade the issue, women almost invariably fail to meet the physical standards required of combat soldiers. According to tests conducted by the Marine Corps, for example, most women are unable to throw a hand grenade beyond its lethal bursting radius. That would

seem to settle the argument rather conclusively, but anti-discrimination zealots refuse to see why this would matter in practice. Proponents generally fall back on the argument that modern war is such a "high tech" affair that strength really does not matter (ignoring the inconsistency that it is usually they who oppose the acquisition of expensive high tech weapon systems for the reason that they don't work anyway). Nevertheless, veterans of the British Army's slog to Goose Green during the Falklands Campaign or the 82nd Airborne Division's drop into Panama would probably argue against the hypothesis that strength and endurance don't matter in modern war.

There is also a misconception as to why certain warlike societies might conscript women. The Israeli example is often cited as a good reason why women should be allowed into combat, but this is entirely beside the point. Israel conscripts women precisely in order that they can perform administrative and supply functions which thereby free males for service in front-line units. Israeli experience with women in combat units in 1948 was disastrous, weakening the élan of males in the same unit and strengthening the resistance of the enemy.

Proponents of women in combat also glide over the fraternization issue, saying in effect that it simply won't exist among professional soldiers of either sex. This assertion contradicts all kinds of common sense experience. The feminists and anti-discrimination advocates, who ordinarily find everyday life replete with sexual harassment, rape, and oppression of the female, contend that these phenomena will magically cease to occur in the U.S. military, even under the stress of combat and the long separation from spouses and mates. In other words, the male is ordinarily a brute, but he will behave like a gentleman in combat.

Before passing on to other aspects of the anti-discrimination phenomenon, it will suffice to reflect on the prospects for national survival if the combat exclusion rule is overturned. Like many other unfavorable social trends, women in combat is an example of the principle of catastrophic gradualism: perhaps the U.S. military can again prevail over a weak opponent like Panama with its combat units composed of ten percent women. It may even prevail under the same circumstances with twenty percent women in the front lines. But should we ever have a fully "integrated" U.S. military composed of 50 percent women facing a first class opponent, the United States will suffer a shattering defeat.

The Erosion of Traditional Values

We have already seen how the anti-discrimination movement has begun to erode the traditional hierarchy of religious and moral values common to virtually all cultures, such as protection of women from combat and the public health taboo against homosexual behavior. The antidiscrimination movement, which is at bottom an exercise in moral relativism and epistemological refusal to differentiate among the phenomena of the physical world, is taking aim at other traditional values as well. One might say that the history of Twentieth Century criminology is the story of an effort to make the criminal and the victim change places on the moral ladder. But while this movement was in the past confined to a relatively small number of

psychologists and prison-system bureaucrats, since the racial riots of the 1960s the effort to blur the distinction between the criminal and the victim has become a core belief of the antidiscrimination ideology.

The antidiscriminators were faced with the need to rationalize the inconvenient fact that violent crimes were committed in lopsided disproportion by members of certain of the ethnic minorities. Rather than accept the hypothesis that increased apprehension and swift punishment would act as such a deterrent as to bring the proportion of future ethnic offenders down, the antidiscrimination movement theorized that (a) the criminals were not responsible for their acts, and (b) the dominant white culture bore the blame.

Since proponents of the antidiscrimination movement are widely represented among judges, lawyers, and parole board members, it now requires the most extraordinary expenditures of time, taxpayer money, and effort to convict a violent criminal and keep him incarcerated. Judicial standards have been revised to the point where the trial is no longer a proceeding to determine guilt or innocence, but rather an exhaustingly long, complicated, and expensive ritual wherein a mountain of evidence may not suffice to convict a criminal, but a scintilla of wrong procedure will serve to set the most violent felon free. Given the almost unbelievable Constitutional protections enjoyed by criminal suspects, the ability of judges to effectively abrogate the decision of the jury by narrow instructions or setting aside jury verdicts, plea bargaining, endless appeals, furloughs from prison, work-release programs, parole, and even arbitrary court-ordered release of inmates because of alleged prison "overcrowding", it is obvious that the ancient and universally held principle that crime entails retribution has been eroded to the point of extinction.

At the same time, progressive political opinion has deemed it necessary to weaken the traditional Anglo-Saxon legal right of self-defense enjoyed by the law-abiding citizenry. The Trojan horse employed for this effort has been the propaganda campaign against private gun ownership, which has taken on curious overtones of animism ("Police Officer Slain by Assault Weapon" is a typical headline). While this partially successful campaign to restrict gun ownership has had no effect on career criminals - indeed, the highest violent crime rates are in jurisdictions with the most stringent gun laws, such as Washington, D.C. - it has made many citizens uneasy about their ability to defend their homes and families.

The prospect of a disarmed public, insufficiently protected by a mentally and physically weakened police force (itself further shackled by the courts and quasi-private antidiscrimination "activists") is bound to embolden professional criminals.

Where this will lead should be evident to every sentient headline reader. One of the greatest criminal cause célèbre of recent times was the incident involving Bernard Goetz. The facts of the case are universally known. What is significant, however, are the extraordinary lengths to which the New York police went to apprehend Goetz, while one suspects the case would have

been handled routinely had he not turned the tables on his would-be assailants. Also revealing was the extreme vindictiveness against Goetz expressed by the Mayor, the District Attorney, official organs such as the New York Times, and other "community leaders." Goetz was white, his assailants were black, and so the matter was settled in the minds of those who represented the progressive face of antidiscrimination. The little man had to be made an example, for if the citizens at large were to follow his lead, the whole modern edifice of the criminal justice system - its featherbedding police unions, corrupt judges, criminal psychologists, social workers, halfway house administrators, parole officers, the entire panoply of bureaucrats who draw material sustenance from the perpetuation of criminality - would come crashing to the ground. In order for the gears of modern egalitarian states to mesh smoothly, the victim must trade places with his tormentors.

Evolution and the Origins of Disease

The principles of evolution by natural selection are finally beginning to inform medicine by Randolph M. Nesse and George C. Williams

SUBTOPICS:

Evolved Defenses Conflicts with Other Organisms

Coping with Novelty

Trade-offs and Constraints

Evolution of Darwinian Medicine

Thoughtful contemplation of the human body elicits awe--in equal measure with perplexity. The eye, for instance, has long been an object of wonder, with the clear, living tissue of the cornea curving just the right amount, the iris adjusting to brightness and the lens to distance, so that the optimal quantity of light focuses exactly on the surface of the retina. Admiration of such apparent perfection soon gives way, however, to consternation. Contrary to any sensible design, blood vessels and nerves traverse the inside of the retina, creating a blind spot at their point of exit.

The body is a bundle of such jarring contradictions. For each exquisite heart valve, we have a wisdom tooth. Strands of DNA direct the development of the 10 trillion cells that make up a human adult but then permit his or her steady deterioration and eventual death. Our immune system can identify and destroy a million kinds of foreign matter, yet many bacteria can still kill us. These contradictions make it appear as if the body was designed by a team of superb engineers with occasional interventions by Rube Goldberg. In fact, such seeming incongruities make sense but only when we investigate the origins of the body's vulnerabilities while keeping in mind the wise words of distinguished geneticist Theodosius Dobzhansky: "Nothing in biology makes sense except in the light of evolution." Evolutionary biology is, of course, the scientific foundation for all biology, and biology is the foundation for all medicine. To a surprising degree, however, evolutionary biology is just now being recognized as a basic medical science. The enterprise of studying medical problems in an evolutionary context has been termed Darwinian medicine. Most medical research tries to explain the causes of an individual's disease and seeks therapies to cure or relieve deleterious conditions. These efforts are traditionally based on consideration of proximate issues, the straightforward study of the body's anatomic and physiological mechanisms as they currently exist. In contrast, Darwinian medicine asks why the body is designed in a way that makes us all vulnerable to problems like cancer, atherosclerosis, depression and choking, thus offering a broader context in which to conduct research.

DEFENSIVE RESPONSES

The evolutionary explanations for the body's flaws fall into surprisingly few categories. First,

some discomforting conditions, such as pain, fever, cough, vomiting and anxiety, are actually neither diseases nor design defects but rather are evolved defenses. Second, conflicts with other organisms--*Escherichia coli* or crocodiles, for instance--are a fact of life. Third, some circumstances, such as the ready availability of dietary fats, are so recent that natural selection has not yet had a chance to deal with them. Fourth, the body may fall victim to trade-offs between a trait's benefits and its costs; a textbook example is the sickle cell gene, which also protects against malaria. Finally, the process of natural selection is constrained in ways that leave us with suboptimal design features, as in the case of the mammalian eye.

Evolved Defenses

Perhaps the most obviously useful defense mechanism is coughing; people who cannot clear foreign matter from their lungs are likely to die from pneumonia. The capacity for pain is also certainly beneficial. The rare individuals who cannot feel pain fail even to experience discomfort from staying in the same position for long periods. Their unnatural stillness impairs the blood supply to their joints, which then deteriorate. Such pain-free people usually die by early adulthood from tissue damage and infections. Cough or pain is usually interpreted as disease or trauma but is actually part of the solution rather than the problem. These defensive capabilities, shaped by natural selection, are kept in reserve until needed. Less widely recognized as defenses are fever, nausea, vomiting, diarrhea, anxiety, fatigue, sneezing and inflammation. Even some physicians remain unaware of fever's utility. No mere increase in metabolic rate, fever is a carefully regulated rise in the set point of the body's thermostat. The higher body temperature facilitates the destruction of pathogens. Work by Matthew J. Kluger of the Lovelace Institute in Albuquerque, N.M., has shown that even cold-blooded lizards, when infected, move to warmer places until their bodies are several degrees above their usual temperature. If prevented from moving to the warm part of their cage, they are at increased risk of death from the infection. In a similar study by Evelyn Satinoff of the University of Delaware, elderly rats, who can no longer achieve the high fevers of their younger lab companions, also instinctively sought hotter environments when challenged by infection.

A reduced level of iron in the blood is another misunderstood defense mechanism. People suffering from chronic infection often have decreased levels of blood iron. Although such low iron is sometimes blamed for the illness, it actually is a protective response: during infection, iron is sequestered in the liver, which prevents invading bacteria from getting adequate supplies of this vital element.

Morning sickness has long been considered an unfortunate side effect of pregnancy. The nausea, however, coincides with the period of rapid tissue differentiation of the fetus, when development is most vulnerable to interference by toxins. And nauseated women tend to restrict their intake of strong-tasting, potentially harmful substances. These observations led independent researcher Margie Profet to hypothesize that the nausea of pregnancy is an adaptation whereby the mother protects the fetus from exposure to toxins. Profet tested this idea by examining pregnancy

outcomes. Sure enough, women with more nausea were less likely to suffer miscarriages. (This evidence supports the hypothesis but is hardly conclusive. If Profet is correct, further research should discover that pregnant females of many species show changes in food preferences. Her theory also predicts an increase in birth defects among offspring of women who have little or no morning sickness and thus eat a wider variety of foods during pregnancy.) Another common condition, anxiety, obviously originated as a defense in dangerous situations by promoting escape and avoidance. A 1992 study by Lee A. Dugatkin of the University of Louisville evaluated the benefits of fear in guppies. He grouped them as timid, ordinary or bold, depending on their reaction to the presence of smallmouth bass. The timid hid, the ordinary simply swam away, and the bold maintained their ground and eyed the bass. Each guppy group was then left alone in a tank with a bass. After 60 hours, 40 percent of the timid guppies had survived, as had only 15 percent of the ordinary fish. The entire complement of bold guppies, on the other hand, wound up aiding the transmission of bass genes rather than their own.

Selection for genes promoting anxious behaviors implies that there should be people who experience too much anxiety, and indeed there are. There should also be hypophobic individuals who have insufficient anxiety, either because of genetic tendencies or antianxiety drugs. The exact nature and frequency of such a syndrome is an open question, as few people come to psychiatrists complaining of insufficient apprehension. But if sought, the pathologically nonanxious may be found in emergency rooms, jails and unemployment lines.

The utility of common and unpleasant conditions such as diarrhea, fever and anxiety is not intuitive. If natural selection shapes the mechanisms that regulate defensive responses, how can people get away with using drugs to block these defenses without doing their bodies obvious harm? Part of the answer is that we do, in fact, sometimes do ourselves a disservice by disrupting defenses. Herbert L. DuPont of the University of Texas at Houston and Richard B. Hornick of Orlando Regional Medical Center studied the diarrhea caused by Shigella infection and found that people who took antidiarrhea drugs stayed sick longer and were more likely to have complications than those who took a placebo. In another example, Eugene D. Weinberg of Indiana University has documented that well-intentioned attempts to correct perceived iron deficiencies have led to increases in infectious disease, especially amebiasis, in parts of Africa. Although the iron in most oral supplements is unlikely to make much difference in otherwise healthy people with everyday infections, it can severely harm those who are infected and malnourished. Such people cannot make enough protein to bind the iron, leaving it free for use by infectious agents.

On the morning-sickness front, an antinausea drug was recently blamed for birth defects. It appears that no consideration was given to the possibility that the drug itself might be harmless to the fetus but could still be associated with birth defects, by interfering with the mother's defensive nausea.

Another obstacle to perceiving the benefits of defenses arises from the observation that many

individuals regularly experience seemingly worthless reactions of anxiety, pain, fever, diarrhea or nausea. The explanation requires an analysis of the regulation of defensive responses in terms of signal-detection theory. A circulating toxin may come from something in the stomach. An organism can expel it by vomiting, but only at a price. The cost of a false alarm--vomiting when no toxin is truly present--is only a few calories. But the penalty for a single missed authentic alarm--failure to vomit when confronted with a toxin--may be death.

Natural selection therefore tends to shape regulation mechanisms with hair triggers, following what we call the smoke-detector principle. A smoke alarm that will reliably wake a sleeping family in the event of any fire will necessarily give a false alarm every time the toast burns. The price of the human body's numerous "smoke alarms" is much suffering that is completely normal but in most instances unnecessary. This principle also explains why blocking defenses is so often free of tragic consequences. Because most defensive reactions occur in response to insignificant threats, interference is usually harmless; the vast majority of alarms that are stopped by removing the battery from the smoke alarm are false ones, so this strategy may seem reasonable. Until, that is, a real fire occurs.

Conflicts with Other Organisms

Natural selection is unable to provide us with perfect protection against all pathogens, because they tend to evolve much faster than humans do. *E. coli*, for example, with its rapid rates of reproduction, has as much opportunity for mutation and selection in one day as humanity gets in a millennium. And our defenses, whether natural or artificial, make for potent selection forces. Pathogens either quickly evolve a counterdefense or become extinct. Amherst College biologist Paul W. Ewald has suggested classifying phenomena associated with infection according to whether they benefit the host, the pathogen, both or neither. Consider the runny nose associated with a cold. Nasal mucous secretion could expel intruders, speed the pathogen's transmission to new hosts or both [see "The Evolution of Virulence," by Paul W. Ewald; *Scientific American*, April 1993]. Answers could come from studies examining whether blocking nasal secretions shortens or prolongs illness, but few such studies have been done.

EVOLUTION OF VIRULENCE

Humanity won huge battles in the war against pathogens with the development of antibiotics and vaccines. Our victories were so rapid and seemingly complete that in 1969 U.S. Surgeon General William H. Stewart said that it was "time to close the book on infectious disease." But the enemy, and the power of natural selection, had been underestimated. The sober reality is that pathogens apparently can adapt to every chemical researchers develop. ("The war has been won," one scientist more recently quipped. "By the other side.") Antibiotic resistance is a classic demonstration of natural selection. Bacteria that happen to have genes that allow them to prosper despite the presence of an antibiotic reproduce faster than others, and so the genes that confer resistance spread quickly. As shown by Nobel laureate Joshua Lederberg of the

Rockefeller University, they can even jump to different species of bacteria, borne on bits of infectious DNA. Today some strains of tuberculosis in New York City are resistant to all three main antibiotic treatments; patients with those strains have no better chance of surviving than did TB patients a century ago. Stephen S. Morse of Columbia University notes that the multidrug-resistant strain that has spread throughout the East Coast may have originated in a homeless shelter across the street from Columbia-Presbyterian Medical Center. Such a phenomenon would indeed be predicted in an environment where fierce selection pressure quickly weeds out less hardy strains. The surviving bacilli have been bred for resistance. Many people, including some physicians and scientists, still believe the outdated theory that pathogens necessarily become benign after long association with hosts. Superficially, this makes sense. An organism that kills rapidly may never get to a new host, so natural selection would seem to favor lower virulence. Syphilis, for instance, was a highly virulent disease when it first arrived in Europe, but as the centuries passed it became steadily more mild. The virulence of a pathogen is, however, a life history trait that can increase as well as decrease, depending on which option is more advantageous to its genes.

For agents of disease that are spread directly from person to person, low virulence tends to be beneficial, as it allows the host to remain active and in contact with other potential hosts. But some diseases, like malaria, are transmitted just as well--or better--by the incapacitated. For such pathogens, which usually rely on intermediate vectors like mosquitoes, high virulence can give a selective advantage. This principle has direct implications for infection control in hospitals, where health care workers' hands can be vectors that lead to selection for more virulent strains.

In the case of cholera, public water supplies play the mosquitoes' role. When water for drinking and bathing is contaminated by waste from immobilized patients, selection tends to increase virulence, because more diarrhea enhances the spread of the organism even if individual hosts quickly die. But, as Ewald has shown, when sanitation improves, selection acts against classical *Vibrio cholerae* bacteria in favor of the more benign El Tor biotype. Under these conditions, a dead host is a dead end. But a less ill and more mobile host, able to infect many others over a much longer time, is an effective vehicle for a pathogen of lower virulence. In another example, better sanitation leads to displacement of the aggressive *Shigella flexneri* by the more benign *S. sonnei*.

NEW ENVIRONMENTS, NEW THREATS

Such considerations may be relevant for public policy. Evolutionary theory predicts that clean needles and the encouragement of safe sex will do more than save numerous individuals from HIV infection. If humanity's behavior itself slows HIV transmission rates, strains that do not soon kill their hosts have the long-term survival advantage over the more virulent viruses that then die with their hosts, denied the opportunity to spread. Our collective choices can change the very nature of HIV.

Conflicts with other organisms are not limited to pathogens. In times past, humans were at great risk from predators looking for a meal. Except in a few places, large carnivores now pose no threat to humans. People are in more danger today from smaller organisms' defenses, such as the venoms of spiders and snakes. Ironically, our fears of small creatures, in the form of phobias, probably cause more harm than any interactions with those organisms do. Far more dangerous than predators or poisoners are other members of our own species. We attack each other not to get meat but to get mates, territory and other resources. Violent conflicts between individuals are overwhelmingly between young men in competition and give rise to organizations to advance these aims. Armies, again usually composed of young men, serve similar objectives, at huge cost.

Even the most intimate human relationships give rise to conflicts having medical implications. The reproductive interests of a mother and her infant, for instance, may seem congruent at first but soon diverge. As noted by biologist Robert L. Trivers in a now classic 1974 paper, when her child is a few years old, the mother's genetic interests may be best served by becoming pregnant again, whereas her offspring benefits from continuing to nurse. Even in the womb there is contention. From the mother's vantage point, the optimal size of a fetus is a bit smaller than that which would best serve the fetus and the father. This discord, according to David Haig of Harvard University, gives rise to an arms race between fetus and mother over her levels of blood pressure and blood sugar, sometimes resulting in hypertension and diabetes during pregnancy.

Coping with Novelty

Making rounds in any modern hospital provides sad testimony to the prevalence of diseases humanity has brought on itself. Heart attacks, for example, result mainly from atherosclerosis, a problem that became widespread only in this century and that remains rare among hunter-gatherers. Epidemiological research furnishes the information that should help us prevent heart attacks: limit fat intake, eat lots of vegetables, and exercise hard each day. But hamburger chains proliferate, diet foods languish on the shelves, and exercise machines serve as expensive clothing hangers throughout the land. The proportion of overweight Americans is one third and rising. We all know what is good for us. Why do so many of us continue to make unhealthy choices?

Our poor decisions about diet and exercise are made by brains shaped to cope with an environment substantially different from the one our species now inhabits. On the African savanna, where the modern human design was fine-tuned, fat, salt and sugar were scarce and precious. Individuals who had a tendency to consume large amounts of fat when given the rare opportunity had a selective advantage. They were more likely to survive famines that killed their thinner companions. And we, their descendants, still carry those urges for foodstuffs that today are anything but scarce. These evolved desires--inflamed by advertisements from competing food corporations that themselves survive by selling us more of whatever we want to buy--easily defeat our intellect and willpower. How ironic that humanity worked for centuries to create

environments that are almost literally flowing with milk and honey, only to see our success responsible for much modern disease and untimely death.

Increasingly, people also have easy access to many kinds of drugs, especially alcohol and tobacco, that are responsible for a huge proportion of disease, health care costs and premature death. Although individuals have always used psychoactive substances, widespread problems materialized only following another environmental novelty: the ready availability of concentrated drugs and new, direct routes of administration, especially injection. Most of these substances, including nicotine, cocaine and opium, are products of natural selection that evolved to protect plants from insects. Because humans share a common evolutionary heritage with insects, many of these substances also affect our nervous system. This perspective suggests that it is not just defective individuals or disordered societies that are vulnerable to the dangers of psychoactive drugs; all of us are susceptible because drugs and our biochemistry have a long history of interaction. Understanding the details of that interaction, which is the focus of much current research from both a proximate and evolutionary perspective, may well lead to better treatments for addiction.

The relatively recent and rapid increase in breast cancer must be the result in large part of changing environments and ways of life, with only a few cases resulting solely from genetic abnormalities. Boyd Eaton and his colleagues at Emory University reported that the rate of breast cancer in today's "nonmodern" societies is only a tiny fraction of that in the U.S. They hypothesize that the amount of time between menarche and first pregnancy is a crucial risk factor, as is the related issue of total lifetime number of menstrual cycles. In hunter-gatherers, menarche occurs at about age 15 or later, followed within a few years by pregnancy and two or three years of nursing, then by another pregnancy soon after. Only between the end of nursing and the next pregnancy will the woman menstruate and thus experience the high levels of hormones that may adversely affect breast cells.

In modern societies, in contrast, menarche occurs at age 12 or 13--probably at least in part because of a fat intake sufficient to allow an extremely young woman to nourish a fetus--and the first pregnancy may be decades later or never. A female hunter-gatherer may have a total of 150 menstrual cycles, whereas the average woman in modern societies has 400 or more. Although few would suggest that women should become pregnant in their teens to prevent breast cancer later, early administration of a burst of hormones to simulate pregnancy may reduce the risk. Trials to test this idea are now under way at the University of California at San Diego.

Trade-offs and Constraints

Compromise is inherent in every adaptation. Arm bones three times their current thickness would almost never break, but *Homo sapiens* would be lumbering creatures on a never-ending quest for calcium. More sensitive ears might sometimes be useful, but we would be distracted by the noise of air molecules banging into our eardrums. Such trade-offs also exist at the genetic

level. If a mutation offers a net reproductive advantage, it will tend to increase in frequency in a population even if it causes vulnerability to disease. People with two copies of the sickle cell gene, for example, suffer terrible pain and die young. People with two copies of the "normal" gene are at high risk of death from malaria. But individuals with one of each are protected from both malaria and sickle cell disease. Where malaria is prevalent, such people are fitter, in the Darwinian sense, than members of either other group. So even though the sickle cell gene causes disease, it is selected for where malaria persists. Which is the "healthy" allele in this environment? The question has no answer. There is no one normal human genome--there are only genes.

SMALL APPENDIX

Many other genes that cause disease must also have offered benefits, at least in some environments, or they would not be so common. Because cystic fibrosis (CF) kills one out of 2,500 Caucasians, the responsible genes would appear to be at great risk of being eliminated from the gene pool. And yet they endure. For years, researchers mused that the CF gene, like the sickle cell gene, probably conferred some advantage. Recently a study by Gerald B. Pier of Harvard Medical School and his colleagues gave substance to this informed speculation: having one copy of the CF gene appears to decrease the chances of the bearer acquiring a typhoid fever infection, which once had a 15 percent mortality.

Aging may be the ultimate example of a genetic trade-off. In 1957 one of us (Williams) suggested that genes that cause aging and eventual death could nonetheless be selected for if they had other effects that gave an advantage in youth, when the force of selection is stronger. For instance, a hypothetical gene that governs calcium metabolism so that bones heal quickly but that also happens to cause the steady deposition of calcium in arterial walls might well be selected for even though it kills some older people. The influence of such pleiotropic genes (those having multiple effects) has been seen in fruit flies and flour beetles, but no specific example has yet been found in humans. Gout, however, is of particular interest, because it arises when a potent antioxidant, uric acid, forms crystals that precipitate out of fluid in joints. Antioxidants have antiaging effects, and plasma levels of uric acid in different species of primates are closely correlated with average adult life span. Perhaps high levels of uric acid benefit most humans by slowing tissue aging, while a few pay the price with gout.

Other examples are more likely to contribute to more rapid aging. For instance, strong immune defenses protect us from infection but also inflict continuous, low-level tissue damage. It is also possible, of course, that most genes that cause aging have no benefit at any age--they simply never decreased reproductive fitness enough in the natural environment to be selected against. Nevertheless, over the next decade research will surely identify specific genes that accelerate senescence, and researchers will soon thereafter gain the means to interfere with their actions or even change them. Before we tinker, however, we should determine whether these actions have benefits early in life.

Because evolution can take place only in the direction of time's arrow, an organism's design is constrained by structures already in place. As noted, the vertebrate eye is arranged backward. The squid eye, in contrast, is free from this defect, with vessels and nerves running on the outside, penetrating where necessary and pinning down the retina so it cannot detach. The human eye's flaw results from simple bad luck; hundreds of millions of years ago, the layer of cells that happened to become sensitive to light in our ancestors was positioned differently from the corresponding layer in ancestors of squids. The two designs evolved along separate tracks, and there is no going back.

Such path dependence also explains why the simple act of swallowing can be life-threatening. Our respiratory and food passages intersect because in an early lungfish ancestor the air opening for breathing at the surface was understandably located at the top of the snout and led into a common space shared by the food passageway. Because natural selection cannot start from scratch, humans are stuck with the possibility that food will clog the opening to our lungs.

The path of natural selection can even lead to a potentially fatal cul-de-sac, as in the case of the appendix, that vestige of a cavity that our ancestors employed in digestion. Because it no longer performs that function, and as it can kill when infected, the expectation might be that natural selection would have eliminated it. The reality is more complex. Appendicitis results when inflammation causes swelling, which compresses the artery supplying blood to the appendix. Blood flow protects against bacterial growth, so any reduction aids infection, which creates more swelling. If the blood supply is cut off completely, bacteria have free rein until the appendix bursts. A slender appendix is especially susceptible to this chain of events, so appendicitis may, paradoxically, apply the selective pressure that maintains a large appendix. Far from arguing that everything in the body is perfect, an evolutionary analysis reveals that we live with some very unfortunate legacies and that some vulnerabilities may even be actively maintained by the force of natural selection.

Evolution of Darwinian Medicine

Despite the power of the Darwinian paradigm, evolutionary biology is just now being recognized as a basic science essential for medicine. Most diseases decrease fitness, so it would seem that natural selection could explain only health, not disease. A Darwinian approach makes sense only when the object of explanation is changed from diseases to the traits that make us vulnerable to diseases. The assumption that natural selection maximizes health also is incorrect--selection maximizes the reproductive success of genes. Those genes that make bodies having superior reproductive success will become more common, even if they compromise the individual's health in the end.

Finally, history and misunderstanding have presented obstacles to the acceptance of Darwinian medicine. An evolutionary approach to functional analysis can appear akin to naive teleology or

vitalism, errors banished only recently, and with great effort, from medical thinking. And, of course, whenever evolution and medicine are mentioned together, the specter of eugenics arises. Discoveries made through a Darwinian view of how all human bodies are alike in their vulnerability to disease will offer great benefits for individuals, but such insights do not imply that we can or should make any attempt to improve the species. If anything, this approach cautions that apparent genetic defects may have unrecognized adaptive significance, that a single "normal" genome is nonexistent and that notions of "normality" tend to be simplistic.

The systematic application of evolutionary biology to medicine is a new enterprise. Like biochemistry at the beginning of this century, Darwinian medicine very likely will need to develop in several incubators before it can prove its power and utility. If it must progress only from the work of scholars without funding to gather data to test their ideas, it will take decades for the field to mature. Departments of evolutionary biology in medical schools would accelerate the process, but for the most part they do not yet exist. If funding agencies had review panels with evolutionary expertise, research would develop faster, but such panels remain to be created. We expect that they will.

The evolutionary viewpoint provides a deep connection between the states of disease and normal functioning and can integrate disparate avenues of medical research as well as suggest fresh and important areas of inquiry. Its utility and power will ultimately lead to recognition of evolutionary biology as a basic medical science.

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Eugenics: Economics for the Long Run

By Edward M. Miller, PhD This paper originally appeared in Research in Biopolitics, Vol. 5, Steven A. Peterson and Al Somit, Eds., Greenwich, Connecticut; JAI Press, 1997, p. 391-416.

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Eugenics: Economics for the Long Run

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There is a simple economic argument for eugenics. Eugenics is defined as efforts to improve the gene pool in a particular population. Standard micro-economic theories of wages hold that a worker's wage equals the marginal product of his working time. Much textbook discussion of his marginal product focus on the quantities of cooperating factors: capital, land, and natural resources which labor has to work with. However, another important determinant is the worker's attributes and abilities. There is evidence that these are strongly affect by his genes (see below). It follows that efforts to maximize a nation's standard of living should try to improve its citizens' genetic quality, especially with regard to intelligence and other economically important traits. Improving the genetic quality of citizens calls for having those carrying the genes for desirable traits (as evidenced by their possession of the traits themselves) producing more than their proportionate share of that nation's children. A secondary economic goal is to minimize the externalities in the economy resulting from the activities of one citizen affecting another citizen. An example would be minimizing the amounts that must be expended on welfare for those unable to earn the socially established minimum standard of living. Such people may be on welfare because of disease and handicaps, because low intelligence or personality problems make it hard to find and retain jobs, or because of drug addiction and alcoholism. Many of these conditions have an important genetic component.

Another important externality is criminal activity. Again it is known that from adoption studies and other sources that criminality has a significant genetic component (Rowe & Osgood, 1984; Lynn, 1996). As a result, an eugenics program can hope to reduce crime rates.

Notice the above arguments hold regardless of whether the intelligence of the population is believed to rising, falling, or remaining constant. If the intelligence is falling and expected to continue falling, it does follow that eventually something must be done or the maintenance of a

modern industrial civilization will prove impossible. The available evidence is that those of higher IQ (who typically have genes that make for higher IQs) are having smaller families than those of lower IQ's (Herrenstein & Murray, 1994; Lynn, 1996; Miller, 1997a).

If a program of eugenics is to be introduced into modern countries, it will most likely be as a byproduct of births being restricted to restrain population growth. Thus, it will be argued below that in the long run society is faced with a choice between having the population restrained by misery, and having it restrained by conscious restrictions of births. Once the idea of preventing some births is accepted, it will then be natural to discuss the question of which births. It is then very likely that decisions will be based at least partially on preventing the births that are most likely to result in what that society regards as low quality citizens. This will be a eugenics program, although as will be pointed out some of the gains may arise from insuring that those children born are born into the families that provide better environments.

Consequence of Unrestrained Fertility

To introduce the case for eugenics consider Diagram 1. [Not available. Ed.] There is a simple income distribution on it with income increasing from left to right. Also shown is a certain level of income below which people fail to reproduce themselves. This is shown as a straight line. However, in practice it is probably a band, with women slightly below the line having only slightly less than two children surviving to adulthood. Women far below the line have relatively few children surviving to adulthood. Above the line the differences in survival to adulthood probabilities are probably small. But in the interests of simplicity, these complexities can not be shown.

What are the conditions for long run equilibrium? The first condition is that the population be stable. Obviously a continually growing population eventually exceeds the resources of the earth, or of the home country. This is not the place to get into debates about just what these limits are, or exactly when the world as a whole or particular country will come up against these limits. The purpose here is to show how societies will differ depending on how the state of zero population growth is achieved, and whether it is done by misery of the Malthusian type, or by eugenics.

It is important that the world is asymmetric, such that being far above the line probably does less for childhood survival than being below it. The diagram shows how with unrestrained fertility, the more unequal the income distribution, the higher the average income. The reason is that for population growth to be constrained by poverty to zero, there must be many below the poverty line. A given level of misery among those whose reproduction is being restrained by poverty is consistent with many different standards of living for those above the line. A more unequal distribution of income permits the average to be further above the line, consistent with any given amount of poverty, including that amount of poverty needed to keep the population stable.

If the distribution of income is to be completely equal, the average woman has to be at the poverty line, such that poverty prevents her from raising only slightly more than a single female offspring to reproductive age. It takes extreme poverty to achieve this outcome. Even in many poor third world countries the population is growing, and the typical woman much more than reproduces herself.

If income becomes more unequal, it becomes possible for most of the population to be far above the poverty line, while still allowing a high enough fraction of the population to be far enough below the poverty line to prevent population growth. This leads to the very unpleasant conclusion that for a nation to enjoy a high average income is consistent with that nation having a stable population only if that income is unevenly distributed. Only with high inequality will enough of the population be far enough below the poverty line to prevent population growth.

Without birth control, any attempt to raise the poor's living standard merely increases their children's survival rates, increases the population, and pulls the average standard of living back down. If income is redistributed from the rich to the poor, one predictable effect is that the rich live less well. Another is that the poor increase in number until rising misery returns the population growth rate to zero. This rather unpleasant vision is the standard Malthusian one.

Unfortunately, in the long run, without population control, attempts to eliminate poverty merely increase the population and reintroduce poverty. The obvious solution is to replace misery as a device for controlling population growth with some other program for limiting the birth rate and stabilizing population. While there is certainly something very intrusive about the government acting to limit births, it seems preferable to allowing population growth to be limited by poverty.

If there is to be some family size limitation, at least among certain families, perhaps we should be asking what criteria should be used to decide who should have children, and who should be prevented or discouraged from having children?

The Role of Genes

This may be a good point to refer to the evidence that many human traits are strongly influenced by genes (Rowe 1994; Lynn 1996; Miller, 1997a). This evidence comes from the science of behavior genetics. The first testable predication of a theory that variability in a trait is genetically influenced is that the trait will run in families. However, traits can also run in families because they are environmentally influenced, and each generation creates for their children an environment similar to the one they themselves were raised in. Thus, it is necessary to look for situations where environmental theories and genetic theories make different predictions.

One such situation is in adoptions, where the environment is created by the family of adoption, and the genes come from the biological parents. If there is no genetic influence, there will be zero correlation between the children's traits and those of the biological parents. To the extent the environment of rearing is influential, the adoptee's traits will be correlated with the family of rearing, while to the extent that genes are influential (or prenatal conditions) it will be correlated with the family of genetic origin. Another method is twin studies. Here findings that monozygotic twins are more alike than dizygotic twins provides evidence of genetic effects. This is an example of a more general effect, in which, by examining the extent to which those who differ in genetic relationships resemble each other, one can model the role of genetic factors. Especially impressive are the studies of separated twins that were raised apart. These frequently grow up to be quite similar in personality and intelligence (Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; Pederson, Plomin, McClearn, & Friberg, 1988).

Due to space limitations, this is not the place to present all the evidence for the importance of genetic factors in intelligence and personality. However, there is strong evidence that most traits are genetically influenced (see for instance Rowe 1994 for summary evidence on the large number of traits for which genetic influences have been shown). Even what appear to be social attitudes have been shown to be affected by genes (Eaves, Eysenck, & Martin, 1989). In general, the evidence for the role of genes in so many factors raises the possibility of controlling who bears children to influence the traits found in succeeding generations. This makes it useful to begin to discuss how eugenic policies might be carried out

Non-Eugenic Discouragement of Population Growth

In the short run, population growth can be restrained by encouraging smaller families by various voluntary means. By lecturing about the dangers of population growth and the environmental problems of a large population, some people may be persuaded to choose smaller families. However, these are likely to be the most responsible people. With each generation, the fraction of such responsible people is likely to decline. There is evidence that altruism (Rushton, 1980) is affected by genes. A voluntary program selects against such genes. Eventually this method will fail.

Because women that have many opportunities for high prestige jobs (professors etc.) frequently take them and choose to have few children, a common proposal for reducing the birth rate is to increase women's access to such jobs (Hoffman, 1975). Rhetorically this makes it easy to be both feminist and concerned about population growth.

For instance, in America the number of children per women 35-44 (when women have virtually completed their child bearing) is 1.6 for women with 16 years or more of education (college graduates usually), while it is 2.6 for those with 0-11 years of education (usually non-high school graduates), with those with in-between levels having 1.9 children for some college, and 2.0 children for high school graduates (Herrnstein & Murray, 1994). Presumably the college

graduates delay the start of childbearing to complete their education (which may continue into graduate and professional school), and then frequently choose an interesting career over staying at home for child rearing. If these effects are caused by the education (rather than a common cause, such as a desire for a career causing the education), it would follow that providing more education for females would reduce population growth. If the whole population of the world had the US pattern of female education and birthrates, overpopulation would not be a threat.

Observations like the above lead many to argue that the solution (or at least a major part of it) for excessive population growth is to educate women, and to increase their opportunity to play high prestige roles in society. Women will then choose these roles over child bearing and rearing.

However, there are problems with this policy proposal (besides the obvious ones of whether the education is really causing the low birth rates, and how poor countries could afford to educate their women so well).

Unfortunately, the evidence is that much of what determines whether women will have access to high paying, high prestige jobs is genetic, notably the genes for intelligence (Jensen 1981; Herrnstein & Murray, 1994; Seligman, 1992, Storfer, 1990). Educating women and encouraging them to take up jobs that reduce their childbearing will work for the first few generations, but it will gradually lower the intelligence level of the population.

Herrnstein & Murray (1994) show that the average IQ of female college graduates was 111, versus 81 for the women who did not finish high school. The others were in between (103 for those with some college, and 95 for high school graduates). If we try to control population growth by encouraging the more intelligent women to choose careers over childbearing, in the long run the average intelligence must decline. This occurs because of the high heritability for intelligence. Because the intelligent women usually marry intelligent men, discouraging reproduction by intelligent women also reduces reproduction by intelligent men. Thus, this apparently desirable method for controlling population growth, so consistent with modern feminism, lacks long run viability.

However, there are other problems with any voluntary method for controlling population growth. It is likely that the drives for fatherhood or motherhood run in families for either cultural or genetic reasons. Those with weaker drives to be parents will be more readily persuaded to forgo parenthood. However, efforts to persuade people to voluntarily forgo parenthood merely assure that in the next generation will come disproportionately from those with stronger drives for parenthood. Thus, a voluntary program will eventually eliminate those who are easily persuaded to forgo parenthood. Those left will, for either genetic or cultural reasons (including religious ones), be unwilling to forgo parenthood. This is similar to the argument made above for appealing to the citizen's altruism to limit population growth. After the altruistic have been persuaded to limit their reproduction, and to gradually eliminate

themselves, who is left that can voluntarily be persuaded to limit their births?

It is also true that some ethnic groups have higher birth rates than other (most likely for cultural reasons). If these differences persist, the mathematics insure that eventually the nation's growth rate will equal the growth rate of its fastest growing ethnic components. To use an extreme example, Hutterites (a sect that does not believe in birth control) may be the fastest growing group in a nation. If other groups can be persuaded to restrict their birth rates, given enough time the Hutterites will become any nation's dominant group. Then that nation's population growth rate will be that of the Hutterites.

Thus, eventually, population must stabilize and the alternatives are:

1. That this is done by restricting births by government coercion
2. This is done by poverty.

For the type of society that can result from poverty see Scheper-Hughes (1992) description of everyday life in Northeastern Brazil. She paints a disturbing picture in which most families live in poverty and infant mortality is very high, high enough so that parents become reconciled to losing children. Indeed, it appears as if they are subconsciously deciding to let some children die of malnutrition. Yet as bad as the situation described is, the population is still growing. The typical poor woman still manages to more than reproduce herself. A even higher degree of misery would be required to limit population growth. Besides limiting population growth rates, there is one other advantage to limiting family size. Right now the poorest families are the largest (Lynn 1996: Herrenstein & Murray, 1994). Mathematically, this implies that the percentage of the nation's children that are raised in poverty exceeds the percentage of the adults that are poor. In the US, child advocacy groups regularly point out the high fraction of the nation's children who are being raised in poverty. They consistently fail to point out how restricting the birth rates among the poor would help to solve this problem. The effect would be partially by lowering the percentage of children who are born into poor families. If this resulted in lowering family size among the poor, the low income families could spread their resources out more among their children.

Spreading the family's resources among fewer children would increase the per child amounts not only for economic resources such as money, but also of non-economic resources. It also permits (but does not guarantee) more parental time per child, and more supervision, which is usually believed to be good. For instance, it is known that children raised in large families more often grow up to be criminals, and in mainstream criminology this is attributed to such children receiving less parental supervision (Lynn, 1996)

Possible Eugenic Goals

If the government is to decide who is to have children, they may wish to decide on some rational criteria, so as to improve the gene pool or to accomplish other goals.

Admittedly, some might try to restrict population growth by an across the board restriction, thus apparently avoiding hard decisions about who should be allowed to reproduce. For instance, families might be somehow limited to two or three children (China now has a limit of one). However, for a stable population, two is too few, and three too many. In theory, one might alternate restriction of two with those of three for different generations (two children per family in several generations, and then a generation permitting three children per couple to rebuild the population). Likewise, if the number required for a stable population was 2.2, one might randomly assign certain families to the three child category, thus avoiding having to make choices on a rational basis. However, either of these procedures for avoiding making hard choices seems to forgo the advantages of selectivity for little reason.

If parental time for child rearing is very important, or if most adults want strongly to be parents, the goal might be families approximately equal in size. Any limits would then be to two or three children per family, and the selectivity would be limited to deciding on some basis which families would be allowed to have three children rather than two.

If the emphasis is more on insuring that children are born with the best possible genes, a greater degree of variability in family size might be considered desirable. Each family might be allowed a minimum of one child to give them the pleasures of parenthood, and possibly to provide society with whatever benefits may result from adults being parents (more conservative behavior among males for instance). The desired average of a little more than two children per family could then be achieved by having the selected parents have at least three children, and possibly more.

While different policies have implications for the percentages of the children that have occupied different birth orders, there is not now strong evidence that would justify preferring children of any particular birth order (Ernst & Angst, 1983). Clearly different strategies could change the percentage of middle children relative to first and last borns. Sulloway (1995, 1996) has presented evidence that first born are more conservative and later born more likely to be rebels, but it is not obvious which society should pick when it can choose. Of course, if the goal is to provide an even more rapid genetic improvement while still retaining traditional family structures, those couples with the worse genetic endowment would be prevented from reproducing. The deficit would be made up for by much larger families among the couples with the better genes (however defined). This would require that many of these families have four or more children. Since there is no real evidence that large families are bad for children, this would seem to be an acceptable alternative.

Of course, if one is willing to explore unconventional family structures such as making more use of artificial impregnation, even where the wife has a husband who could father her children,

or where the potential mother lacks a husband (as with single women or lesbian couples), there is scope for more rapidly spreading desirable genes. One might even consider cloning now that this has been shown to be possible in mammals (Specter, 1997).

Eugenic Aspects of Non-Eugenic Policies

Anything that slows the reproduction of those with genetic traits society does not want to perpetuate may be an eugenic policy. These aspects are not always discussed.

For instance, prison visits of wives for sexual purposes may encourage births by those carrying genes for criminality. Yet the discussions of this typically consist of the opponents saying that prison should be as unpleasant as practical, and that it is inconsistent with punishment to provide sexual access. On the other side, those in favor of conjugal visits typically argue they help to hold marriages together, prevent the spouse from being penalized, and perhaps help in managing the prisoners. Mention of any genetic effect seems to be missing.

It is sometimes proposed that rapists be castrated. This is generally proposed merely as punishment, but yet it should reduce the births of those with personality traits (possibly poor impulse control) that lead to rape and other crimes (for a discussion of the role of genes in rape see Ellis, 1989).. Castration seems to work. Recidivism rates have been found to be 0 to 7.4% in a study of 2,055 European rapists (Bradford, 1990), which is far lower than the US recidivism rates, which have been reported to be as high as 40%. Given that castration is likely to be far cheaper than years of imprisonment, it might be used.

Perhaps even more effective in reducing rapes might be surgery that prevented erections by cutting relevant nerves. This would eliminate the reinforcing effects of fantasies accompanied by masturbation, probably reducing the motivation for rape and other sex crimes. This is purely a speculative proposal at this stage, but one that should be the subject of some discussion. In principle, castration might be used for other violent crimes also. It has the attraction of being relatively low cost. If there is a substantial genetic basis for most crimes, and the evidence is that there is (Lynn, 1996), castration would reduce the number of offspring left by such criminals. If it is desirable to reduce the rate of population growth for other reasons, as was argued above, criminals would seem to be good ones to deprive of the benefits of fatherhood. Of course, castration of criminals might deprive their wives or girl friends of parenthood. It is likely in many case they would become pregnant even without artificial insemination. However, with the availability of artificial insemination, they would be expected to frequently choose artificial insemination rather than remaining childless. The result would be replacing the sperm of a criminal with what could be a very high quality sperm. Obviously that would tend to reduce the frequency of the genes most closely related to criminal activity.

One side benefit of such a program would probably be selection against low intelligence. It is known that arrested criminals tend to have below average intelligence. For instance, Herrenstein

& Murray (1994, p 248) found that 12% of the male whites in the very dull category were in a correctional facility when interviewed versus 3% for the whole sample.

Population Control via Incentives: Eugenic Aspects

There are a number of ways people might be induced to limit births that would not involve coercion (other than to pay the taxes to finance the programs). Most such programs would probably have an eugenic effect since those with lower incomes or shorter time horizons would probably find any given incentive program more attractive.

Payments for sterilization might be offered, say \$5,000 or \$10,000. These sums would be attractive to those who have a weak desire to leave descendants. Very likely such programs would select for other desirable traits such as a tendency to weight income in the distant future less than in the present. Banfield (1974) has argued that a greater desire for current pleasure (related to the economist's concept of time preference) lies behind many of the inner city problems. For instance, if one needs \$20 for a date tonight the easiest way to obtain it is to snatch someone's purse. Admittedly, repeated purse snatching is likely to end in a jail sentence, but that is sometime in the distant future. At a high enough interest rate, stealing the purse becomes rational.

Likewise, drug taking brings immediate pleasure even if at the cost of future addiction. Sex brings immediate pleasure even if the cost is unwed motherhood, or for the father, financial responsibility for children. Watching TV is more pleasant than studying, but studying has long run returns in higher income. Maintaining real estate takes time, but over the long run it makes for a more comfortable home. Saving (and forgoing use of credit) reduces current consumption, but increases future consumption. Creating a small business often means putting in long hours and doing without many pleasures. However, eventually, the small business may succeed. One can imagine many such examples. There is very little solid research on whether time preference has a genetic basis. It is known to vary with ethnic background. For instance, in Trinidad children of Indian descent (ancestors from India) are less willing to accept a small piece of candy now rather than a larger piece of candy in the future than those of African descent (Mischel & Metzger, 1962). However, since most personality traits are strongly affected by genes with a substantial heritability, it is very likely that the ability to defer gratification is a trait with a genetic component.

If a desire for immediate gratification plays a role in criminality, as it appears to (Wilson & Herrnstein, 1985), it is to be expected that restraining the reproduction of convicted criminals would also tend to restrict the reproduction of those with a short time preference.

It is very likely that many modern methods of birth control select for a desire for immediate gratification. Consider for instance the simple condom. Using this for birth control requires stopping the sequence of events (often seduction) that lead to impregnation to put a condom on.

Those who have a strong desire for immediate gratification are much less likely to do this. The same argument applies to inserting a diaphragm, coitus interruptus, or using sponges. Even using birth control pills requires obtaining the pills in advance, and remembering to take them at the right time.

A significant fraction of births represent failures of birth control (Van Court, 1983). For the United States, the Kost & Forrest (1995) analysis of the National Survey of Family Growth reported that 36% of births were unplanned. For those with less than twelve years of education, 58% of the births were unplanned versus only 27% among college graduates. Besides the obvious dysgenetic effect on intelligence, these probably have a dysgenic effect in that the families that who have children through birth control failure are probably less willing to defer gratification, and have a lower ability to plan ahead. Also, it is very likely that inability to defer gratification goes with a lower intelligence. Incidentally, the high fraction of births that are unplanned suggests that improved methods of birth control that are easier may have a significant eugenic effect.

One other trait that may go with accidental pregnancies is drinking alcohol. Many people are inhibited about sex and loosen up with alcohol (or are plied with alcohol by their potential sex partners). Alcohol in general lowers inhibitions. These lower inhibitions are both towards having sex, and towards having unprotected sex. In the modern world, where most children born are raised to sexual maturity, the fact that birth control methods are readily available to most everyone to be used or not, may act as a selective agent for alcohol consumption. The reason is that people who are drunk, or merely under the influence of alcohol are less likely to use birth control, and are therefore more leave offspring with the same propensity for alcohol consumption. However, this desire for alcohol also goes along with alcoholism, and this makes a mate less desirable (and intoxication can make the sex act harder for males). Boulding (1969) has proposed transferable licenses for child bearing, each couple to get 2.2 licenses. They could then be bought or sold. Those who valued children most would have the larger families (probably a good in itself). In practice, many poor people and those with short time horizons would sell their licenses for the money. This would have a desirable eugenic effect. Barry (1969) has proposed payments for potential parents who have no more than two children, such payments to be proportional to income. He bases the proposal to make the payments proportional to income on a desire to have the upper and middle classes restrict their fertility as much as the lower classes. His rationale for trying to restrict fertility as much in the upper and middle classes is to maintain the opportunity for upward mobility for the poor. Interestingly, this paper, although appearing in a journal stating on the cover that it was formerly the *Eugenics Quarterly*, displays no awareness that restriction of fertility among the lower classes would increase the genetic quality of the population. However, his explicit rationale for trying to avoid disproportionate fertility restriction among the lower classes does point out a possible disadvantage to eugenics programs. If fertility is disproportionately restricted among the lower classes as a successful eugenics program would do, there is likely to be more social downward mobility, with more of the population feeling they were ranked lower than their parents (and

they will be correct). If moving downwards in the social hierarchy makes people feel bad (and it does), this is a disadvantage to an eugenics program.

Any plan that offers large sums of cash for sterilization, or for restricting child bearing, would reduce the birth rates most among those with a strong desire for current consumption. Such large cash payments would be especially attractive to drug addicts who often need money to purchase drugs. There could be expected to be effects on future rates of drug abuse from such an eugenics program.

If it were politically possible, one might even trade drugs for sterilization or implantation of a birth control device, or at least provide enough drugs so that there would not be withdrawal problems around the time of the sterilization. Since crack, alcohol, (and probably other drugs) affect the fetus, there would be strong social savings if these addicted women could be prevented from having children. It could also slow down the spread of AIDS, which is frequently transmitted from mother to child. Notice that such benefits are environmental in nature.

Welfare and Birth Control

An obvious idea is to tie the receipt of welfare to using a drug which prevents having additional children while on welfare, such as Norplant. Given the correlation of being on welfare with low intelligence, and probably with other undesirable genetic traits, such a proposal would improve the nation's genetic stock. Given the difficulty of knowing whether promises to use birth control are being observed, tying receipt of welfare to using most methods of birth control is probably infeasible. Penalizing mothers for having babies after they promised not to would either end up penalizing the children, or force the mothers into having abortions.

It is to be expected that any measure that reduces the pool of low IQ, uneducated individuals would reduce the competition for the jobs such people can do. Such a program should reduce the unemployment rate, and raise incomes among the low IQ part of the population.

The final outcome of such birth control would be to reduce inequalities by two mechanisms.

1 Reducing the number of those with traits leading to low income (low IQ, short time preference, etc.) in the society. This raises the weighted average skill level.

2. By raising the wages rates for unskilled labor. It is a standard prediction of economic models that reducing the supply raising the price. It follows that reducing the supply of low wage labor would raise the wage rates for such services.

Public support

Although the word eugenics is very unpopular among intellectuals, there may not be as much opposition among the ordinary voters.

One Texas legislator in an informal poll found 3,533 to 2,604 in favor of sterilization for welfare moms with 3 or more children. (Reilly, 1991, p.161). The Boston Globe found, in a call in telephone poll, that 49% supported sterilization of the mentally ill.

China has apparently adopted a sterilization law targeting mentally retarded parents in one province (Reilly, 1994, p. 164). While China is politically quite different from the United States, this still shows that such actions may be possible.

Singapore has announced eugenic programs aimed at promoting births by the better educated (Chan, 1987), and in particular by graduate women. There was also announced a program to reward low income families under 30 with less than two children for being sterilized with US\$4,000 as a down payment for a government low cost apartment.

Arguments Against Eugenics

Of course, there are arguments against eugenics programs. Government power over private citizen's lives is always subject to abuse. So history teaches. US state run programs seem to have had problems with some sterilizations that were not for good eugenic reasons (Reilly, 1991). Any government program is going to make numerous mistakes and possibly suffer from some corruption. Certainly it has not always been known which traits were genetically influenced, and there were some sterilizations done under the various laws that probably do not contribute to improving the genetic stock. For instance, there is a case of a woman who was the offspring of incest, but apparently otherwise unhandicapped, being sterilized.

Currently, we are far from having much knowledge of which genes influence particular traits, or from knowing all the traits that are subject to genetic influences. If we were given complete copies of the genetic sequences for two individuals we could not tell which one we preferred. That is true. However, such a high level of knowledge is not needed for a useful eugenics program. It is generally known that many traits are genetically influenced (see above) and people generally agree on which direction is good. For instance:

1. High intelligence is good.
2. Self control is good.
3. Criminality and rape are bad.
4. Most diseases are bad.

The above provides a basis for deciding whose reproduction to encourage. At this point we could proceed with a start on programs, hoping to improve knowledge in the future.

One theoretical concern is that many traits may be influenced by pleiotropic genes such that selecting for a desirable trait also selects for another trait that is undesirable. Thus there could be unintended consequences from an eugenics program.

To illustrate the type of problem that is theoretically possible consider myopia. This is widely considered to be a genetically influenced condition. It is known to run in families, and twin studies show it to have a high degree of heritability (Curtin 1985). However, it is also known that high intelligence and myopia go together (Teasdale, Fuchs, & Goldschmidt, 1988; Rosner & Belkin 1987; Benbow & Benbow 1984, p. 484 and 1986). High intelligence is also known to be a partially genetic trait. The evidence is that the two genetic traits are pleiotropic, with one gene affecting both (Cohn, Cohn, & Jensen, 1988). One possibility is that the close work that results from reading and studying leads to myopia. Another, which the writer has proposed, is that a single gene (or gene complex) affects both brain size and the size of the eyeball (which is embryologically derived from the same tissue as the brain) and this produces the correlation (Miller 1992, 1996d).

Now, if someone tried to discourage those with myopia from reproducing, a byproduct would be selection for lower intelligence. This would be unfortunate, since myopia is relatively easily handled with corrective glasses. Of course, enough is known so that the above mistake appears unlikely. About the only way it could be made would be for a version of political correctness to make selection for intelligence impossible, while selection against genetic disease related conditions was promoted.

A slightly more difficult problem is the possibility that genes that promote certain forms of mental illness are also genes that contribute to genius or originality. There is some evidence for this proposition (Eysenck 1995; Goodwin & Jamieson, 1990; Karlsson, 1991). Efforts to discourage reproduction by those with manic-depressive illness or schizophrenia, both of which have been shown to have a genetic component in twin studies, might produce adverse effects on creativity.

One can also imagine other unanticipated genetic problems. Many polymorphisms are believed to protect against one disease but to increase vulnerability against another. They survive in the population over the long run because whenever a particular allele become more common, the diseases it makes for vulnerability to become more common, and the allele making for vulnerability is selected against.

It must be admitted there is a chance that this could happen. If we knew that a particular allele made for vulnerability to a particular well-publicized disease, say AIDS, there might be pressure

to discourage reproduction by carriers of such an allele. Indeed, a mutation that appears to protect against AIDS has been recently found (Kolata, 1996). This could increase vulnerability to another disease where the effect was not known, or just possibly a new disease would then emerge that could then spread more rapidly. It is also conceivable that a gene for a desirable trait may also increase vulnerability to a disease.

Another theoretical argument that is sometimes heard is that genetic diversity is needed for further evolution and that eugenic programs might reduce this diversity, eliminating a desirable allele. The analogy is sometimes made with certain crops where the genetic diversity may have been greatly reduced, increasing the vulnerability to certain diseases.

However, in any one generation any realistic program will make only minor changes in the gene pool. This will give plenty of time to reverse direction if unintended consequences emerge. Desirable genes are unlikely to be eliminated from the gene pool by a feasible short-term eugenics programs. Any appreciable reduction in diversity is so far in the future that little concern is needed for now.

Eugenics when the Problem is Partially Environmental in Origin

Frequently those who object to eugenics programs to reduce births in families suffering from a particular problem assert that the targeted social problem is environmental in origin. For instance, if it is proposed to raise average intelligence levels by reducing the number borne to parents with low intelligence, it may be argued that low intelligence is of environmental origin. It is definitely true that there is an environmental component to most social problems, including low intelligence and poverty.

However, it does not follow that eugenics programs cannot reduce problems caused by social causes. Whenever a problem is known to run in families, reducing the number of children in families with the problem should reduce any problem's incidence. Suppose low intelligence was caused by a unknown type of bad parenting that was in certain families, with each child as an adult copying its own parents' bad parenting. Increasing the fraction of children in the families that practiced good parenting (which might be determined by the parents themselves being of high intelligence) would still increase intelligence in the next generation. An environmentally caused problem whose exact mechanism is unknown can be handled by decreasing the fraction of births in certain families, just as a genetically caused problem can be handled. In most cases the policy implications of environmentally and genetically caused low IQ are the same as far as who is encouraged to have children. The key question for predicting the effects of a program is the correlation between the IQ's of parents and children. Knowing the causes of this correlation is not critical. There are a few cases of low IQ known to be due to environmental causes (say an accident that injured the brain) where there would be no eugenic objection having children. However, such cases are rare. Even in these cases, one might feel that it was best for the child not to have a low IQ parent and wish to discourage childbearing.

Eugenic programs that work by manipulating family size can be expected to work, although slowly and over a period of generations. If there are unrecognized environmental factors being transmitted from parents to children, such programs will also increase the percentage of children exposed to such positive environmental effects.

Westman (1994), convinced that bad parenting leads to most problems has written a book which proposes licensing parents. Some of his proposals would probably end up having eugenic effects. Those who could not get licensed as parents would probably be of genetically low intelligence, and the proposal would end up having positive eugenic effects.

Admittedly, if it were known that there existed a particular environmental factor that affected intelligence, an obvious alternative would be to deal directly with the factor. For instance, if it turned out that rocking children to sleep promoted intelligence (the reference is to speculations in Storfer 1990), it would still be true that we could increase the percentage of intelligent children in the next generation by encouraging parents who were intelligent (who had probably been rocked to sleep themselves). Even more efficient would be to encourage those who planned to rock children to sleep to have large families. Of course, if we did have knowledge that such a simple intervention raised intelligence, we would not choose to exploit it by manipulating family size depending on their proclivity to rock children to sleep. Instead we would have a program to teach mothers to rock their children to sleep, or perhaps we would discover that mothers themselves had already read the research results and were rocking their children to sleep.

However, as of now we know of few environmental interventions that do much for children's intelligence, or that improve other aspects of their personality. Spitz (1986) has traced the history of efforts to raise intelligence by environmental means. There is a long series of episodes in which some intervention was proposed, received much favorable publicity, and was then found to have little permanent effect. The most recent such episode has involved early childhood programs of the Head Start type. These were found to temporarily raise intelligence scores. However, once removed from the program the children were found to gradually return to the low level of performance of those who had never been in such programs.

That there is little hope for environmental manipulation in raising IQ is shown by adoption studies in which even the intervention of putting children into whole new environments seems to have little effect on their adult intellectual performance, although some effect on childhood performance is seen. For instance, Loehlin, Horn, & Willerman (1989) found that unrelated adopted siblings, when tested at 13-24 years of age, had essentially no resemblance to each other ($r = -.01$). Scarr and Weinberg (1978) studied children aged between 16 and 22 in adopted and biological families. In the adopted families the correlations were .16 between adopted father and child, .09 between mother and child, and -.03 between siblings. Children who were raised from infancy together differ as much as unrelated pairs of children. This provides powerful

evidence that the environment of rearing has little impact on adult intelligence. If the massive intervention of changing the family of rearing (which also affects things like schooling) has little impact, the chances seem small that more modest interventions that affect only schooling, housing, health, or a similar variable will have much impact.

The same study showed correlations between siblings of .35 when raised in biological families, and .40 between father and child, and .41 between mother and child. Since it was argued above that the family of rearing had relatively little impact, most of these similarities must be because parents, children, and sibling share genes. This, of course, is evidence for genetic effects. However, regardless of what is causing the resemblance between parents and children in biological families (which are the vast majority of families), the fact of such resemblance suggests that increasing the percentage of children borne into high IQ families will raise the intelligence of the next generation. One should not hope for a massive rate of improvement, but the potential for improvement is there.

It is here that one finds the chief political problem with eugenic programs. At best one can hope for only slow increase in the frequency of genes for a trait. If a politician is looking for something he can announce that will plausibly make a difference by the next election, or even by when he retires, eugenic programs will seldom appeal. Given the ease of confusing correlation with causation, and the large number of variables that can be correlated with social outcome variables, there will virtually always be some intervention that can be plausibly argued to have the potential for having a quicker impact. Some may even be plausibly claimed to capable of solving the problem, eliminating the need for a eugenics program. Since there is usually significant prestige and money associated with sponsoring such an intervention, there can be expected to be partisans for one or more such interventions arguing for them. For a politician looking for a program he can announce that will plausibly be dealing with a serious social problem, there will usually be several candidate programs supported with at least correlational evidence (even if no one has yet done a well controlled intervention study).

How are such partisans to be defeated, or how is one going to determine whether they should be defeated (since there is a small chance that one of their interventions will indeed prove very effective)? It is probably wise to press for actual experimental evidence (from studies with adequate controls) that such programs work. A problem is that partisans are likely to be so convinced that their programs work that they will argue that it is unethical to deprive some citizens of the program in order to provide a control group. Yet this must be done if we are to know which, if any, interventions work. When the interventions take the form of providing poorer children with what the educated prosperous families already enjoy, the evidence from the low correlations of adopted children with siblings can be used to suggest the programs will not work. Eugenic type programs are unlikely to be adopted because of arguments that they are solutions for social problems. They work too slowly to be attractive for this alone. They are likely to be adopted when there is agreement that birth rates are too high, and that some will have to forgo child bearing. This then forces consideration of the question of who should forgo

childbearing. One can then argue that the parents which do not exhibit the traits that society values, and (who are likely to be carrying undesirable genes), are those that should forgo child bearing.

The biggest political problem with eugenics now is its association with Nazi Germany and the claim that the extermination of the Jews was part of their eugenics program (see Kuhl, 1994). While there is not space here for a full answer, it appears the Nazi Anti-Semitism was why they tried to exterminate the Jews (see Saetz, 1985). Given the strength of that drive, the outcome would have been the same regardless of their views on eugenics.

The Racial Obstacle

The other major political problem is that desirable genes are distributed unequally among the racial groups, as is the socioeconomic status and phenotypic traits that would be used as surrogates for the possession of desirable traits. The trait that is most economically important is intelligence (Herrenstein and Murray, 1994; Seligman 1992). There is no real dispute that races differ in measured intelligence, and not much dispute among experts on intelligence that the difference is real in the sense that it is reflected in unequal school and job performance. There is more debate as to what causes it. Even in the 1980's the experts were divided three to one in favor of explaining for black/white differences in IQ by both genetic and environmental causes (Snyderman and Rothman, 1988).

Perhaps the most powerful evidence for a difference in the frequency of genes affecting intelligence is provided by the outcomes of the experiment of adopting black children into white households, where at age 17 the gap between black and white adoptees was approximately that which is found when children of each race are raised in families of their own race (Levin, 1994; Lynn, 1994). Among the recent pieces of evidence that at least part of the racial difference is genetic is the Jensen & Johnson finding (1994) that the black/white difference in head size in children disappeared when intelligence was controlled for. Jensen (1994) also found that the extent of the g loading on a test (roughly how well the test measures only intelligence) was significantly related to the correlation of the test with head size.

There are numerous other reasons for believing that the genes affecting many socially important traits differ in frequency between the races (Miller 1994b, c, d, 1995a, b, 1996a, b, 1997b, 1997c; Rushton 1995).

It follows that any eugenics program in the United States that does not contain special provisions for blacks will restrict the reproduction of blacks more than it does of whites. In the current environment, such a program would be denounced strongly as racist. This alone would prevent such a program from being adapted. Of course, programs could be designed to provide quotas for different racial groups, or to make other special provisions. On the other hand, if the program offers voluntary payments for sterilizations or for having Norplant inserted, blacks and

other low income groups would receive a disproportionate proportion of the financial incentives. However, this is unlikely to keep the current black leadership from objecting vehemently to such programs.

Forces for Eugenics

However, in the developed world of the US, Europe, and Japan there does not seem to be the compelling need to restrict family sizes. Birth rates are near, and often below, that needed to keep the population from growing. In these circumstances, the power elites will see eugenic programs as restricting their freedoms and are unlikely to be supportive. This leaves one with the somewhat pessimistic conclusion that a slow deterioration in the genetic quality of the developed world's population is likely to continue. What could change this? Probably the most likely thing to change is the state of scientific knowledge. As time passes, more and more knowledge of genetics accumulates. More importantly, the molecular genetics revolution makes it likely that someday the working of the relevant genes will be discovered at the molecular level. It is also possible that the biology behind intelligence and certain forms of behavior will come to be understood well enough so that it will seem very plausible that genes are determinative.

For instance, Tu & Israel (1995) have found that alcohol consumption by Orientals in North America is predicted largely by a single gene. Berman & Noble (1995) have found reduced visuospatial performance in children with the D2 dopamine receptor A1 allele. Plomin et al (1995) have found evidence for genetic markers being related to IQ. Skuder et al (1995) have found evidence for a polymorphism in mitochondrial DNA that is associated with IQ. Reed et al. (1995) have shown lower cognitive performance in normal older adult male twins carrying the apolipoprotein E*4 allele. The apolipoprotein E*4 allele (Kamboh, 1995) is known to increase susceptibility to Alzheimer's disease. Keltikangas-Jarvinen, Raikkonen & Ki (1993) have shown apolipoprotein E phenotypes affect temperament in children, adolescents, and young adults. Bertilsson et al (1989) have shown that there are personality differences that correspond to differences in Debrisoquine hydroxylation (a genetic difference). Lesch et al (1996) have very recently presented evidence that differences in a gene affecting the regulation of serotonin affects anxiety. As findings of this type accumulate, it will be easier for the public to accept the idea that genes affect behavior. As another example, the author has put forward a theory in which intelligence depends on the extent of myelination (Miller 1994a, 1996c). The theory is supported by extensive empirical analysis and explains a wide variety of facts. It is also empirically testable by directly measuring the amount of myelin after death for the more intelligent, and comparing it with the amounts found in the less intelligent brains. Likewise, there is now a large literature showing that brain size (and head size as a proxy for brain size) is correlated with intelligence (Miller, 1992; Rushton & Ankney, 1996; Wickett, Vernon, & Lee, 1994; Willerman, Schultz, Rutledge, & Bigler, 1991). As such evidence becomes better accepted, more people will find it easy to believe that such variables as brain size or myelination are subject to strong genetic effects. Hopefully, this in turn will make it easier to

accept that intelligence is itself genetically influenced. For those that doubt that brain size has substantial heritability there is already evidence that head size has substantial heritability (Rushton & Osborne, 1995).

Another possibility is that technology may make some types of eugenics more feasible, and they become popular. Modern fertility enhancing technology is expensive and is primarily used by families of high income who badly want a child. Thus it probably has some eugenic effects.

Artificial insemination has a potential for being used for eugenic purposes. In many couples where the male has inadequate quantity or quality of sperm, the couple chooses to use artificial insemination in order to have children. There is probably some positive eugenic effect in the current sources of sperm since many are reported to be near universities or medical schools where the population would be of above average intelligence. However, while great care is taken to screen donors for genetic diseases and for sexually transmitted diseases, it is not now customary to use an intelligence test to select donors of high intelligence, although such tests would be easy to administer. Yet given the willingness of parents to pay for expensive college educations for their children, it would surely seem worthwhile for the potential parents to pay the slightly higher costs of higher quality sperm. The costs would be slightly higher because not only would there be the cost of testing, but it would probably be necessary to pay more to donors in order to have a larger pool to select from. However, the cost would still be minor in relation to the total cost of conceiving and rearing a child. If well-heeled parents seek the best designer jeans for their offspring, why shouldn't they seek the best genes? However, one sperm bank has received considerable publicity by seeking high quality, intelligent donor, originally Nobel prize winners. (See Graham, 1983) There is no reason other sperm banks could not adopt similar methods. Since one sperm donation can supply several inseminations and donors can be expected to donate repeatedly, the cost of seeking high quality donors would be low. In spite of the apparently very high benefit-cost ratio from selecting sperm on the basis of the donors intelligence, an Italian doctors group has decided that there should be no selection of sperm based on the social, economic or professional standing of the donor (Montalbano, 1995). Yet, these are all cheaply ascertained surrogates for intelligence, and other genetic traits that contribute to obtaining high social and professional standing.

Should Lesbians or single women become mothers by artificial insemination? If the sperm used is of high quality, it is very likely that the offspring will be of high intelligence, and unlikely that they will become public burdens. Should post-menopausal women have babies using advanced technology and their husbands sperm, as a 62 year old women recently did in Italy (Montalbano, 1995). Given the high cost of such technologies, it is very likely that their husbands had genes for high intelligence. Yet this measure was to be banned by the new Italian doctors code, as was artificial insemination after a partner's death . More speculatively, it is now feasible to fertilize a woman's egg outside of the womb and then implant it. Right now the procedure is used only for couples who would otherwise be infertile. One can imagine a time when the wealthier couples have potential embryos checked for genetic problems, or perhaps

have several embryos fertilized and then select the one for implantation that appears genetically the best.

Mammalian cloning has been shown to be possible, and if applied to humans will probably involve the cloning of high IQ individuals, even if the basis for choosing an individual to clone is something else (being the dictator, or having extraordinary talents in certain areas).

It is also conceivable that selective abortion might be used to avoid bearing children that carry what are considered undesirable combinations of genes. This is done to a limited extent now for Downs syndrome and certain other genetic conditions. If such expensive procedures are adapted they may be adapted by the wealthier couples rather than the poorer ones.

A factor that could lead to eugenics programs is that the power elite is likely to have the genes that we would like to encourage. This elite will be very receptive to rationalizations that will permit those who wish for large families to have them. A rule that exempted those of high IQ from family size restrictions would virtually always exempt the elite (politicians, executives, professors, union leaders, army officers etc.) from family size restrictions. Likewise, programs that discourage those convicted of crimes (or suffering from alcoholism or drug abuse) from having children are unlikely to impact heavily on the ruling classes. If circumstances emerge where nationwide family size restriction is desirable, eugenics may come to provide the rationale for the rule makers to exempt themselves from the rules.

Conclusions

There is sufficient knowledge now about the importance of genetic factors to indicate that, over time, income could be raised by eugenics. Such a program is not politically feasible now, but someday it may be, especially when overpopulation makes it necessary to restrict births. Eugenics may then become popular among the ruling classes because it provides a rationale for exempting them from the restrictions that would otherwise apply.

In practice, eugenics programs may take the form of trying to reallocate child bearing from families with undesirable traits to families with desirable traits. This should increase for the next generation the proportion of the population with desirable traits. Although such programs are traditionally referred to as eugenics programs (i.e. ones to improve the population genetically), such programs can be expected to work for traits transmitted within families from parents to children regardless of whether such transmission is by genetic means or by other means. All that is necessary to predict the success of such programs is to know the correlation to be expected between parental traits and those of the offspring, information that is already available for many traits.

Even when the degree of political support for direct eugenic measures is weak (say only 20% of the population would vote for them) consideration of the eugenic effects of alternative ways of

accomplishing certain goals might change the ranking of alternative methods for accomplishing these goals, and produce some eugenic benefits.

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Ethnicity and Ideology

Gavan Tredoux, June 1990.

1. Introduction

This is an exploration of ethnicity and its ideological disfigurement by liberalism; it forms part of a larger study of political ideologies and their relationship to ethnicity. More ambitiously, this is an attempt to reconstruct modern political philosophy.

2. Definitions

Certain words are used in special senses in the discussion that follows. An *ethnie* is a named human community, with a shared myth of common ancestry, an imagined history and a distinctive culture.(1) A sense of solidarity and an attachment to a particular territory often form part of this complex. Membership of an *ethnie* is fundamentally ascriptive; that is, ethnic identity is not a matter of choice, but ascribed by others, within and without the *ethnie* - thus ethnicity is best considered as an extension of kinship. 'Nationalism' is an integral part of this - the aspiration of the *ethnie* to statehood and political power. These are all complex notions with a wealth of theory and analysis behind them, which will be taken for granted in what follows.(2)

3. Liberalism & Ethnicity

Modern western society is steeped in liberalism & liberal political theory: consider the rule of law, the restriction of the state and its subordination to the citizenry, freedom of expression and the right to privacy. There is a notion of citizenship at the heart of all this: the citizens of the liberal society are individuals - the sole moral agents - whose citizenship is equal in every respect. This 'citizen' is an entity deliberately abstracted from a particular person; people have a unique history, personality, heritage; 'citizens' are simply 'citizens'. Transparently, no liberal order could differentiate between its citizens, not knowing any of their peculiarities. The state provides nothing more than a framework for social interaction, and its authority stops at the abstract 'citizen', whose conscience and particular actions are protected by anonymity.

Historically, modern liberalism emerged partly as a critique of feudalism and the 'old order' in Europe; the core of the liberal programme was always the abolition of inequality, and not material inequality but abstract inequality of citizenship, of the social rank enshrined in feudalism and the old order. Tied to this was the formal vesting of authority in the 'citizens', or 'the people', rather than the state itself, or the church.

Ethnicity, with its ascription of identity, roots the individual in a special history, a unique heritage; ethnicity is the antithesis of abstraction. Freedom to choose an identity, or even to

have an identity at all, disappears in a complex of description from within and ascription from without. The 'individual citizen' is now a concrete person entwined in a web of identities and relationships - trapped. There is an inherent potential here for unequal citizenship, for hierarchical ranking of ethnies; as we have already noted, hierarchies and a scale of social roles are important facets of feudalism, and liberalism was constructed specifically as a critique of social hierarchy and ascription of social roles. By its very nature then, ethnicity is foreign to liberalism, incomprehensible.

Liberal social scientists prove an interesting case study of this liberal antipathy toward ethnicity. As van den Berghe notes, in the context of American social science: "The great American liberals ... presented a monolithic ideological front - a genuine party line on race and ethnicity."⁽³⁾ Central to this party line is the claim that all humans are fundamentally the same in all respects, that ethnocentrism is an irrational attitude, even socially dysfunctional, and peculiar to 'authoritarian personality types'. Attached to this is a faith in the assimilation of ethnies in modern society; a conviction that societies progressively lose ethnic consciousness as they modernize. Ethnicity is an archaic fetter, on this view, broken by modernization; an anachronistic residue of traditionalism inevitably eroded by industrialization, urbanization and modern communications and transport. This process ought to be encouraged, on the liberal view, as both inevitable and desirable. Liberal social science, and liberalism in general, presumes that human behaviour and action is motivated, above all else, by material self-interest.⁽⁴⁾ To act on the basis of material self-interest is to act, ultimately, as an individual; to attach most importance to material self-interest is to attach least importance to ethnic identity, if any. Behaviour motivated by a sense of ethnic identity, a concern for the status of one's ethnie in the face of ethnic pluralism, is not even other-regarding (as opposed to self-regarding), it seems to be nothing-regarding; for an ethnie has no tangible existence in itself, nor can it be reduced to a particular set of people. To the liberal, this sort of behaviour is fundamentally irrational and socially dysfunctional, and hence a problem; to the liberal social-scientist it is not so much a problem but an opportunity, to demonstrate that what appears to be ethnically-motivated behaviour is really materially-motivated⁽⁵⁾, restoring rationality to human behaviour and credibility to an ideology which presumes precisely that sort of rationality. To reiterate: ethnicity is foreign and incomprehensible in the liberal scheme, given liberalism's thoroughgoing individualism, its historical antipathy toward feudalism, its abstract notion of citizenship, its faith in social modernization and progress, and its presumption that the fundamental motivation of human behaviour is material self-interest. This is superbly illustrated by the Lockean and Rawlsian notions of 'social contract': society ought to be viewed as nothing more than a collection of freely contracting individuals, who are morally prior to that society and to each other, each worthy of equal respect and treatment, by each other and by the political arrangements of the society contracted into. To the extent that ethnicity is foreign to liberalism, to the extent that ethnic behaviour is incomprehensible within the liberal framework, to the extent that liberalism conflicts with the perception of self, the perception of others, and the perception of oneself by others; to that extent, liberalism is simply a failure. Ethnicity is an irreducible social phenomenon in its own right; a wealth of evidence demonstrates is pervasive

influence, throughout history, on human society and conduct(6); moreover, ethnicity appears to be the single most important basis of social organization, of far greater durability and universality than social class. The fundamental motivator of human behaviour is not material self-interest, but ethnic identity; concern for the status of one's ethnic group, for the well-being of that ethnic in the most intangible sense of myth and culture, for the well-being of the members of that ethnic, as members. This is a statement of fact, and a fact that utterly divorces liberalism from the object of its discourse; it is as if liberalism has an entirely different world in mind. The extent to which this undermines liberal credibility will become clearer later.

Naturally, liberals might claim to have an account of what ought to be, rather than what is; society might be irreducibly ethnic, but it shouldn't be. Morally speaking, mankind is one homogeneous whole, and people ought to act as if it is; that they usually act otherwise is neither here nor there. Unfortunately, this is a lonely row to hoe; one can easily formulate moral prescriptions any time of the day or night, but others can just as easily disregard them. The trick is to get others to agree that the liberal scheme is in fact theirs, and of course, any liberal theorist worth his salt knows this.(7) To an extent, liberals have been highly successful at this, at least in those western societies now known as 'liberal-democracies' - The United Kingdom, The United States of America, the countries of Western Europe and the like. However, these are all unusually homogeneous societies; insofar as they have exhibited ethnic pluralism, this has always posed very difficult problems for the prevailing liberal ideology - consider the debate surrounding 'affirmative action' in the United States.(8) The key to a proper understanding of modern liberalism, its success and its failure, lies in its intimate relationship with ethnic nationalism and ethnic homogeneity; a relationship that is obscured by its antipathy to ethnicity in general. It is no accident that liberalism has been most successful in ethnically homogeneous countries, and least successful in ethnically heterogeneous, plural societies; it was framed for homogeneous societies. As Michael Waltzer puts it, in an even broader context: "Most political theorists, from the time of the Greeks onward, have assumed the national or ethnic homogeneity of the communities about which they wrote [T]he assumption of a common language, history, or religion underlay most of what was said about political practices and institutions."(9) Not only does liberalism presuppose homogeneity, it also contributes to that homogeneity; liberalism is part of the imagining of a community. This is an important and often overlooked point, worth exploring in greater detail.

That rare phenomenon, the modern European nation-state, is a product of an unprecedented wave of ethnic nationalism that reached its peak in the late 19th century, ultimately culminating in the doctrine of self determination. This movement had its immediate roots in the French Revolution of 1789, but was intimately connected to the more abstract notion of popular sovereignty; the debt that nationalism owes to liberalism here has often been noted.(10) Thus Anthony Smith remarks that "In modern European history, there was a classic link between liberalism and nationalism. Broadly speaking, liberalism gave birth to modern nationalism"(11)

However, to see liberalism as merely a cause of nationalism, or a contributing factor, is to miss a crucial point; liberalism is part of modern nationalism. The notion of citizenship embodied in liberalism, with its removal of the hierarchy and inequality associated with feudalism and the old order in Europe, is a crucial ingredient in the formation (or invention) of a national community, which necessarily transcends social class, status and region. The liberal citizen becomes part of an imagined community, which accepts his membership unconditionally; by doing so, the 'community' welds together a socially and regionally disparate set of people. All 'communities', to a greater or lesser extent, are inventions(12); this sort of invention is a cultural phenomenon, and liberalism is best seen as part of this broader context - the cultural construction of a moral, political, historical and artistic illusion of community. Of course, this 'citizenship' is bound to a particular 'community'; in the modern context, citizenship is associated with a special nation, and removes internal differentiation, within the imagined community, while at the same time it separates particular nations from others.

In terms of ethnicity, the liberal notion of citizenship is part of the formation of ethnic (or 'national') unity and homogeneity, which may or may not involve the assimilation or combination of various ethnies. It is clear then why appeals to ethnic sentiment within a community are illegitimate in the liberal scheme; they destroy the illusion of unity that liberalism helped to invent. This also explains why minorities in liberal democracies - like the aboriginal inhabitants of the USA, Canada, Australia; the recent black and Asian immigrants in Britain; and the acculturated but unassimilated black community in the USA - have such an ambiguous position. American liberalism was always, at the very least implicitly, tied to the Anglo- Saxon, and later the European, part of society; these are the people referred to in the Bill of Rights, as originally adopted, and these are the people the political system was built around. Similarly, the South African political and legal system was always tied to the European community; the status of others was, at best, incidental.

The fact that national or ethnic homogeneity is an extremely rare phenomenon in the modern state system, places liberal theory in grave danger - one that liberals are increasingly aware of.(13) There are many dimensions to this, but the case of separatist minorities is particularly instructive. Many liberal democracies contain minorities who claim a special status, some even going so far as to demand independence within a separate state; at the very least, these minorities claim and exercise a special hold over their members, which flies directly in the face of the liberal idea of universal citizenship. In the United States, Canada and Australia, aboriginal inhabitants agitate for the retention and extension of special reserves and ancestral land for their communities; one facet of this is the exclusion of other non-aboriginals from these reserves. Liberalism can currently provide no sensible account of this.

While some liberals are attempting to reconstruct the ideology to make sense of ethnicity, we can now see that this would be a difficult task indeed. An examination of rival ideologies like Marxism comes to much the same conclusion; from this angle, Marxism and liberalism look like estranged siblings with the same congenital defect. This calls for nothing less than a

reconstruction of modern political theory, to provide a credible account of the political and social arrangements of ethnically plural societies. Something like this has been underway for some time now, through the study of 'consociational democracy' and democratic instability in plural societies, but the philosophical, moral dimensions of this remain largely unexplored.

Footnotes

1 There is no single word in the English language to describe the notion of ethnic community, so the French *ethnie* will be used.

2 The bibliography lists some of the best recent literature cf. van den Berghe [1981], Horowitz [1985], Connor [1972].

3 Van den Berghe [1981], p.2

4 Rawls [1971], arguably the most influential single piece of liberal political theory this century, explicitly presumes material self-interest as the fundamental motivator of human behaviour, even making this a premiss in his attempt to derive a liberal account of justice.

5 See Horowitz [1985], van den Berghe [1981] and Connor [1972] for analysis and rebuttal of this type of argument.

6 This is not the place to prove these points; see Horowitz [1985].

7 Rawls [1980, 1985] investigates this idea in detail; the Rawlsian programme no longer pursues 'moral truth' in any metaphysical sense, it now searches for a 'practicable' account of liberal justice that could command the assent, upon sincere self-reflection under fair conditions, of the typical citizen of a modern western liberal democracy.

8 See Glazer [1975] and Cohen et al [1977] for some contributions to the debate within American liberalism surrounding affirmative action and 'reverse discrimination'.

9 Waltzer [1981], p.1

10 See Kedourie [1961]; Connor [1973] contains a good discussion of the role that the French Revolution played in the genesis of modern European nationalism.

11 Smith [1986b], p.47

12 See Anderson [1983] for a discussion of the cultural dimensions of the imagining of communities.

13 Kymlicka [1989] and van Dyke [1985] are recent attempts to provide some kind of account of ethnicity within a liberal framework.

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Does Head Start Make a Difference ?

By Janet Currie and Duncan Thomas*

The impact of participation in Head Start is investigated using a national sample of children. Comparisons are drawn between siblings to control for selection. Head Start is associated with large and significant gains in test scores among both whites and African-Americans. However, among African-Americans, these gains are quickly lost. Head Start significantly reduces the probability that a white child will repeat a grade, but it has no effect on grade repetition among African-American children. Both whites and African-Americans who attend Head Start, or other preschools, gain greater access to preventive health services. (JEL I38, H43)

Head Start is a federal matching grant program that aims to improve the learning skills, social skills, and health status of poor children so that they can begin schooling on an equal footing with their more advantaged peers. Begun in 1964, as part of the "War on Poverty," Head Start has enjoyed great public and bipartisan support. Presidents George Bush and Bill Clinton both pledged to increase federal funding so that all eligible children could be served. Today 622,000 children, roughly 28 percent of eligible 3-5-year-olds, are served at a cost of \$2.2 billion per year, or approximately \$3,500 per child, per year (Anne Stewart, 1992).

Policymakers and the general public appear to believe that the benefits of Head Start are well known and well documented. However, a careful reading of the literature reveals that credible studies that demonstrate lasting effects of Head Start are limited. The studies that do exist are typically restricted to small geographic regions and specific racial groups.

In this study we use a national sample of data from the National Longitudinal Survey of Youth (NLSY) and the National Longitudinal Survey's Child-Mother file (NLSCM) to reexamine the impact of Head Start on school performance, cognitive attainment, preventive medical care, and health and nutritional status. Although our study is no substitute for a national randomized trial, we do take some novel steps to sort out the effects of the Head Start program from possible nonrandom selection into the program. First, we contrast children who have been enrolled in the Head Start program with their siblings who have not, in order to control for family background effects on cognitive and health outcomes. Second, using the same sibling contrasts, we compare the impact of Head Start relative to "no preschool" with the impact of participation in other preschools relative to "no preschool." These "difference-in-difference" estimates further control for possible biases in the estimates due to child-specific determinants of participation in Head Start.

When selection is controlled in this way, Head Start has positive and persistent effects on the test scores and schooling attainment of white children, relative to participation in either other preschools or no preschool. In contrast, while the test scores of African-American children also increase with participation in Head Start, these gains are quickly lost, and there appear to be no

positive effects on schooling attainment.

Relative to "no preschool," participation in either Head Start or preschool is associated with improved utilization of preventive medical care, as proxied by immunization rates, among whites and African-Americans. In contrast, there is no evidence that Head Start has any effect on child height-for-age, a longer-run indicator of health and nutritional status.

The rest of the paper is laid out as follows. The first section contains a brief overview of the previous literature. In the second, the methods are discussed. The third section provides a description of the data and our child outcome measures. The estimated effects of Head Start are presented in the fourth section. We conclude with a crude assessment of the possible long-term benefits of the program and weigh these against its cost.

I. A Brief Sketch of the Literature

Most previous studies of Head Start have focused only on assessing gains to IQ, despite the broad goals of the Head Start program. For example, although Head Start provides "a comprehensive health services program which includes a broad range of medical services" (Head Start Bureau, 1992), a recent review of 210 studies conducted by the US Department of Health and Human Services (Ruth McKey et al., 1985) cites only 34 studies that have examined effects on health. These studies provide useful qualitative information about the health effects of the program, but very few of them attempt to quantify, the effects in any way. McKey et al. also note that very few studies have examined the impact of Head Start on schooling attainment.

The most convincing studies of the IQ effects of Head Start utilize a treatment and control design with random assignment. These studies typically find that there are initial gains to Head Start which fade over time and become insignificant by the third grade. However, Steven Barnett (1992) notes that experimental evaluations of the longer-term effects on IQ may be biased by attrition because children who move are likely to be lost from the experiment (although the direction of any bias is not obvious). A second limitation is that existing experimental evaluations have not been based on national samples of children in representative Head Start programs. Many studies, for example, focus exclusively on African-American children.

Head Start is also said to be associated with reductions in grade repetition, high-school dropout rates, and teen pregnancies, and with improvements in children's medical care and health status (cf. Children's Defense Fund, 1992). The most widely cited evidence in support of these longer-term benefits of Head Start actually comes from experimental studies of model preschool programs such as the Perry Preschool Project or the Tennessee Early Training Project. These programs were funded at higher levels, involved more intensive interventions, and had better-trained staff than the typical Head Start program. For example, the Perry Preschool Project was funded at a rate of about \$6,000 per child (almost twice that of the average Head Start program). Twenty years after the program, researchers found that the "treatments" were more likely to

graduate from high school, had fewer pregnancies per female child, and had lower crime rates. However, the study involves a very small sample of 58 treatments and 65 controls, and many differences (such as the rate of teen pregnancy and the rate of violent crime) are not statistically significant (John R. Berrueta-Clement et al., 1984).

In summary, despite literally hundreds of studies, the jury is still out on the question of whether participation in Head Start has any lasting beneficial effects.

II Methods

The key empirical problem facing us is that, as we will see below, children are not randomly selected into the Head Start program. The program guidelines require that 90 percent of participants must be from families living below the federal poverty line although, in practice, 95 percent of children served in 1992 were poor (U.S. Department of Health and Human Services, 1993). In addition to being poor, Head Start children may also be disadvantaged in other observable ways. Estimates that do not take account of these differences are likely to underestimate the beneficial effects of the program. We will, therefore, examine the impact of Head Start on child well-being conditional on an array of observable mother and child characteristics.

The economic model of the family (Gary Becker, 1981) suggests that families choose whether or not to make the effort necessary to enroll their children in Head Start or other preschools on the basis of the expected returns from that investment. Families who find this investment worthwhile may make other unobserved investments in the child's human capital. In this case, studies that do not take account of unobserved differences between families may overestimate the beneficial effects of Head Start.

At many sites, there are fewer places than child applicants, and so participant selection will also reflect the choices made by program administrators. There are over 1,300 Head Start programs (Cheryl Hayes et al. 1990), all administered at the community level, and there is a good deal of heterogeneity, in their management and quality and in the interpretation of the federal guidelines (U.S. Department of Health and Human Services, 1993). Remarkably little is known about the selection practices used by administrators, although Ronald Haskins (1989) cites evidence that local staff tend to select the most disadvantaged children to participate in Head Start. Similar evidence on selection procedures is suggested by Lee et al. (1990). Unlike most adult training programs, evaluation is not based on child performance in the program, and so there is little incentive to cream off the more able applicants. In any case, whatever the mechanism underlying participant selection by administrators, estimates of the effects of Head Start that do not take this process into account may be biased.

In order to control for unobserved characteristics correlated with selection into the program we estimate models with fixed effects for each household. These models control for constant

characteristics of households, including permanent income, maternal education, and other measures of (unobserved) family background and tastes. If it is primarily these constant factors that determine participation in Head Start, then fixed-effects models will provide unbiased estimates of the true program effects.

However, there may also be child-specific factors that affect participation. If, for example, parents wished to maximize the sum of their offspring's lifetime utility, then they might choose to enroll more able children in Head Start. On the other hand, if they seek to equalize outcomes, they might enroll the least able child. In the first case, fixed-effects estimates would provide an overestimate of the impact of Head Start, while in the latter case, they would yield an underestimate.

There are two other reasons why the inclusion of household fixed effects could bias estimated program effects toward zero. First, it is well known that in the presence of measurement error, differencing can result in "throwing the baby out with the bath water," since much of the true "signal" may be discarded while the "noise" remains.

Second, in the fixed-effects models the effects of Head Start are identified using the subset of households in which some children attended Head Start while others did not. If there are any spillover effects of Head Start from one sibling to the other, then the difference between the two siblings will be an underestimate of the true program effect. Spillover effects may be important because a child teaches his or her sibling something learned in Head Start, because the parent gains access to a service that is of benefit to both children, or because the parent makes compensating investments in the non-Head Start child.

In order to gain an understanding of the importance of the potential biases in the fixed-effects estimates due to child-specific factors, and spillover effects, we compare fixed-effects estimates of the effects of participation in Head Start to fixed-effects estimates of the effects of enrollment in other preschools. The decision to enroll a child in some other kind of preschool is also properly treated as a choice. As is the case for Head Start, fixed-effects estimates of the impact of other preschools will be unbiased if there are no unobserved child-specific characteristics that affect this choice, and no spillovers.

If the child-specific factors or spillovers bias the estimated coefficients on Head Start and on preschool in the same way, then the difference between the estimated coefficients will be accurately estimated, even if the individual coefficients are not. For example, suppose that parents send favored children either to Head Start or to preschool, depending on their means, and keep other children at home. In this case the fixed-effects estimates of Head Start and other preschools will both be biased upward. But the estimated difference between the effects of Head Start relative to no preschool and the effects of other preschools relative to no preschool will be subject to less bias.

We show below that, for several of our outcome measures, the fixed-effects estimates of the effects of Head Start exceed those of enrollment in other preschools. Still, there are two possible ways in which these results could be driven by the biases discussed above. First, it could be the case that children who attend either kind of preschool are systematically more favored or more able than their siblings and that the gap in ability between Head Start children and their stay-at-home siblings is greater than the gap between other preschool children and their siblings. Second, spillover effects could be greater within families in which a subset of children attend other preschools than within families with a subset of children attending Head Start.

It is difficult to rule out the possibility that the degree of parental favoritism is greater in households with some children who attend Head Start than in households in which some children attend preschool. However, we do not find any evidence consistent with the view that Head Start children are favored. For example, relative to their siblings, they are no more likely to be taken to the doctor in the first three months of life, and they score no higher on the "recognition of body parts" test, a test that was administered to sample children before they were age-eligible to attend Head Start. Moreover, we will discuss evidence below which suggests that preschool children may actually be more favored relative to their siblings than Head Start children, in which case the difference between the estimated effects of Head Start and preschool in the fixed-effects models provides a lower bound on the true difference.

Finally, the potential for spillover effects may be greatest in the most disadvantaged households and among children in programs like Head Start that make explicit attempts to improve parenting skills. In this case, Head Start effects will be underestimated relative to the effects of other preschools in the fixed-effects models. Spillovers are also likely to accrue to younger siblings, and we explicitly investigate this issue.

III. Data Description

The National Longitudinal Survey of Youth (NLSY) began in 1979 with 6,283 young women who have been surveyed annually ever since. As of 1990, these women were aged 25-32 and had given birth to over 8,500 children. In 1986, the NLS began a separate survey of the children of the NLSY, the National Longitudinal Survey's Child-Mother file or NLSCM. The second and third waves of the NLSCM were undertaken in 1988 and 1990. In these two waves, mothers were asked whether their children had ever participated in Head Start. For this study, data on children and their mothers from all three waves of the NLSCM have been combined with information about the mother drawn from each wave of the NLSY. Attention is restricted to children aged 3 and older, and since the fixed-effects estimates are based on sibling comparisons, the sample includes only children who have at least one sibling over three years old. These rules result in a sample of nearly 5,000 children.

It is important to note that the original NLSY oversampled the poor, and so a relatively large proportion of the sample children-about one-fifth-participated in Head Start. In addition, due to

oversampling there are large enough numbers of African-Americans to allow separate examination of this group.

Table 1-Child Outcome Measures

Measure Age group Comments

PPVT score 4 + Only measured once per child. Percentile scores based on nationally accepted norms for age and gender are used. Measures taken while a child was in preschool or Head Start are not used.

Absence of grade 10+ "Has your child repeated any grades repetition for any reason?" Coded 1 if the mother answered no in both 1988 or 1990, and zero otherwise. Not asked in 1986.

Measles shot all Had child had a shot as of 1990?

Height-for-age all Asked in 1986, 1988, and 1990. The measure taken closest to the child's fifth birthday is used.

A. Child Outcomes

We focus on four measures of child outcomes. The first pair are indicators of academic performance: the Picture Peabody Vocabulary Test (PPVT) score and whether the child has progressed through school without repeating a grade. The second pair of outcomes are related to child health: whether the child has been immunized for measles, and height standardized by age and gender using national norms (height-for-age). Table 1 provides details about the coding of these variables. Each row shows the measure, the age group for whom the measure was recorded, and some additional comments.

The relationship between test scores and future wages has received considerable attention from economists. In his summary of this literature, Eric Hanushek (1986 p. 1152) concludes that, in most studies, "years of schooling and measures of cognitive ability exhibit independent effects on earnings." Unfortunately, the majority of these studies focus on the scores of high-school students rather than on those of young children. However, Richard Murnane et al. (1993) find that a high-school senior's mastery of skills taught no later than the 8th grade (as measured by achievement on standardized tests) is an important determinant of future wages.

While there is some evidence that test scores predict future schooling and labor-market outcomes, the relationship is certainly not one-to-one. For example, developmental psychologists emphasize that a positive self-image and appropriate socialization may also contribute to scholastic success. Thus, the absence of grade repetition is examined as a second, more direct measure of academic performance.

Academic performance in early grades has been shown to be a significant predictor of eventual high-school completion (Atlee L. Stroup and Lee N. Robins, 1972; Dee N. Lloyd, 1978; Byron Barrington and Bryan Hendricks, 1989; Robert Cairns et al., 1989; James Grissom and Lorrie Shepard, 1989; Margaret Ensminger and Anita Slusarcick, 1992). The relationship between high-school completion and wages is well-established: most studies find that an additional year of high school is associated with an 8-percent increase in lifetime wages (see Joshua Angrist [1990] for a recent estimate). High-school graduates are also less likely to be unemployed (James Markey, 1988). Educational attainment has also been shown to be associated with improvements in health (Michael Grossman, 1973) and job satisfaction (Robert Michael, 1982; Robert Haveman and Barbara Wolfe, 1984). These results suggest that by improving performance in early grades, Head Start participation could translate into a significant increase in the probability of graduating from high school with attendant improvements in future wages and employment probabilities.

As discussed above, in addition to early childhood education, the Head Start program provides a broad range of health-care services. Specifically, Head Start guidelines require that each child be given a physical examination; an assessment of immunization status; a growth assessment; vision, hearing, and speech tests; a hemoglobin or hematocrit test (for anemia); and a tuberculin skin test. Head Start centers are also required to screen for sickle-cell anemia, lead poisoning, and parasitic infection, if these problems are common in the community. The NLSCM data only allow us to assess immunization status, and growth (as discussed below), but given the guidelines, it is not unreasonable to suppose that children who gain access to immunization services are also more likely to gain access to at least some of the other required health services. In this case, immunization can be viewed as a marker for access to a bundle of important health services.

Head Start program performance standards also state that "every child in a part-day program will receive a quantity of food in meals... and snacks which provides at least 1/3 of daily nutritional needs... (Head Start Bureau, 1992 p. 40). Poor children are at much greater risk of nutritional deficiencies than other children. For example, 21 percent of 1-2-year-old children in low-income households suffer iron anemia compared to 7 percent of 1-2-year-olds from higher-income households (Barbara Devancy et al., 1989). These deficiencies have been linked to short attention spans, lethargy, impaired immune status, and growth retardation.

With our second measure of child health, we place the spotlight on nutrition. Height-for-age is an indicator of both nutritional status and health, and it captures the effects of longer-term deprivation. It has been profitably used in the economic history and development literatures (see for example Robert Fogel [1986], Reynaldo Martorell and Jean-Pierre Habicht [1986], and the review in John Strauss and Thomas [1995]). Many readers may be surprised to find that even in as rich a society as the contemporary United States, poor children are at risk of stunting, defined as low height-for-age. Data from the second National Health and Nutrition Survey (National

Center for Health Statistics, 1981) indicate that 15 percent of poor female children 2-5 years old are below the fifth percentile of height-for-age. The corresponding figure for males is 11 percent.

Since child growth varies systematically with age and gender, height is standardized following guidelines from the National Center for Health Statistics (1976). Each child in the sample is compared with the median child in a population of well-nourished white children of the same age and gender in the United States, and the sample height-for-age expressed as a percentage of this median. However, given evidence of systematic deviations from the standards in populations of poor children, we use the measure of height taken closest to the child's fifth birthday in order to compare siblings of approximately similar ages.

B. Characteristics of Head Start and Other Children

The characteristics of Head Start children, other preschoolers, and all other children are presented in Table 2, distinguishing whites from African-Americans. Neither Head Start participants nor enrollees in other preschools are random samples of children: the probability of attending Head Start declines with income, whereas the probability of attending other preschools rises with permanent income. For example, among all children living in house holds in the bottom quartile of the permanent-income distribution, nearly 30 percent have attended Head Start, whereas only 15 percent attended other preschools. In the top quartile, 40 percent of children attend other preschools and 4 percent attend Head Start. Slightly over half the children in the sample never attend any preschool, and that fraction is essentially constant across the income distribution. This suggests that the mechanism governing selection to Head Start is quite different from that underlying selection into other preschools, or even into no preschool.

Table 2 shows that, in addition to lower average levels of permanent income, Head Start children are disadvantaged in most other observable respects. Relative to children who attended other preschools, children who attended Head Start have mothers and grandmothers who are less educated, and who had lower scores on the Armed Forces Qualification Test (AFQT), a measure of human capital. These differences between Head Start and other preschool children are all statistically significant for both whites and African-Americans, although the gaps are substantially larger among whites. For example, the difference in maternal education between white children in Head Start and white children in other preschools is 1.6 years, while the difference is only 0.8 years among African-Americans. The major exception to this generalization is that the mothers of African-American Head Start children are as tall as the mothers of other African-American children, while white mothers of Head Start children are shorter than other white mothers. White Head Start children also tend to be disadvantaged relative to children who attended no preschool, though the gaps are smaller than those between the Head Start and preschool groups. Among African-Americans, however, the only significant difference is in income: in all other observable respects, Head Start children are no worse off than their peers who attended no preschool.

Finally, Table 2 shows that, relative to whites, and controlling for preschool status, African-American mothers of Head Start children are actually better educated than comparable white mothers, although they tend to live in lower-income households. However, the AFQT scores of African-American women are much lower than those of whites, a fact that is true throughout the income distribution and suggests that AFQT measures more than native "ability."

Table 2-Characteristics of Mothers and their Children: Means and Standard Errors

Whites African-Americans

Characteristics All Head Preschool Neither All Head Preschool Neither Start Start

Mother:

Permanent 26.12 16.89 32.73 24.08 17.26 15.04 21.29 16.55 household income (1990 (0.26)
(0.39) (0.52) (0.30) (0.29) (0.38) (0.75) (0.42) \$1,000's)

Human capital

Education 11.70 10.91 12.48 11.37 11.84 11.64 12.48 11.62

(0.04) (0.09) (0.06) (0.05) (0.05) (0.07) (0.09) (0.07)

AFQT score 0.83 0.58 1.01 0.78 0.43 0.37 .055 0.42

(0.01) (0.02) (0.02) (0.01) (0.01) (0.02) (0.02) (0.02)

Height 63.85 63.42 64.06 63.83 64.01 64.12 64.18 63.83 (inches)

(0.04) (0.12) (0.07) (0.06) (0.07) (0.11) (0.14) (0.11)

Grandmother's 9.81 8.68 10.69 9.51 10.02 9.74 10.18 9.77 education (0.06) (0.15) (0.09) (0.08)
(0.07) (0.11) (0.13) (0.11)

Number of 4.03 4.68 3.74 4.58 5.45 5.68 4.97 5.55 Maternal Siblings (at (0.05) (0.13) (0.07)
(0.07) (0.09) (0.15) (0.17) (0.13) age 14)

Child

Age in 99.18 115.04 94.27 98.30 107.4 119.07 98.57 104.72 Months, 1990 (0.68) (1.78) (1.01)
(0.99) (1.09) (1.18) (2.00) (1.73)

First Borna 0.47 0.50 0.56 0.41 0.44 0.47 0.47 0.39

(0.01) (0.02) (0.01) (0.01) (0.01) (0.02) (0.03) (0.02)

Maleb 0.49 0.47 0.48 0.49 0.51(0.01) 0.48 0.55 0.52

(0.01) (0.02) (0.01) (0.01) (0.02) (0.03) (0.02)

Number of 3,285 450 1,149 1,686 1,502 477 376 649 Children:

Sample 100 14 35 51 100 32 25 43 proportions:

Notes: Standard errors are given in parentheses. Maternal education is measured as highest grade attained. The AFQT score is age-standardized. The number of maternal siblings is the number when the mother was age 14.

aDummy variable = 1 if first born.

bDummy variable = 1 if male.

C. Parental Favoritism? Evidence from Within-Family Income Differences As discussed above, the fixed-effects models estimated below are identified using the subset of families with at least one child who attended Head Start and at least one who did not. Similarly the effects of preschool attendance are identified using the subset of children in which at least one child attended preschool and at least one did not. Table 3 focuses on the within-family income changes that are associated with participation in Head Start and other preschools.

Panel A of Table 3 reports, for children who attended Head Start, other preschools, or no preschool (in the columns), the percentage with siblings who attended Head Start, other preschools, or no preschool (in the rows). For example, the entry in the upper left corner of the

Table 3-Characteristics of Children and Their Siblings by Type of Preschool Attended

A. Percentage of Children and Siblings by Type of Preschool Attended

White child attended: African-American child attended:

Sibling Head Preschool Neither Head Preschool Neither attended Start Start

Head Start 41.3 5.7 10.9 57.1 18.2 19.6

Other 15.5 61.8 22.4 14.2 50.2 17.1 Preschool

Neither 43.2 32.6 66.7 28.6 31.7 63.3

Total: 100 100 100 100 100 100

Sample 310 848 1,230 329 259 480 size:

B. Income by Type of Preschool Attended by Child and Sibling: Means and Standard Errors

Whites African-Americans

Row Child Sibling Permanent Income Permanent Income at attended attended income at age 3
income age 3

1 Head Start Head 17.36 14.17 13.76 11.4 Start

(0.79) (1.11) (0.57) (0.81)

2 preschool preschool 34.23 34.81 24.44 23.27

(0.83) (1.54) (1.71) (4.3)

3 neither neither 23.53 20.32 16.17 13.73

(0.40) (0.59) (0.53) (0.73)

4 Head Start neither 16.29 13.18 16.9 14.89

(0.66) (0.77) (0.99) (1.41)

neither Head 13.11 13.91 Start

(1.06) (1.85)

5 preschool neither 30.07 28.32 18.26 17.33

(0.78) (1.14) (1.21) (1.84)

neither preschool 21.92 9.77

(1.28) (1.24)

6 Head Start Preschool 19.80 14.92 19.51 17.32

(1.46) (1.91) (1.31) (2.03)

preschool Head 19.65 20.19 Start

(2.90) (2.62)

All 26.12 23.35 17.5 15.02 children:

(0.30) (0.48) (0.35) (0.66)

Note: Standard errors are reported in parentheses.

table indicates that 41 percent of white children who attended Head Start had a sibling who also attended Head Start, and therefore, 59 percent had a sibling who did not. In the fixed-effects models, only the latter group is used to identify the effects of Head Start.

Of these 59 percent, the vast majority (about three-quarters) did not attend any preschool. Thus, fixed-effects estimates of the impact of Head Start will be based largely on within-family comparisons of children in Head Start with siblings who did not attend any preschool. The converse is also true: families with at least one child in preschool and at least one child not in preschool were unlikely ever to have had a child in Head Start. Estimates of the effects of Head Start and other preschools are therefore based on largely non-overlapping samples of families. This result is important because it facilitates the comparison of Head Start effects to the estimated effects of attending other preschools.

Panel B of Table 3 presents the means and standard errors of two measures of income for each type of sibling pair. Permanent income (which is family-specific) is reported in the first column, while income at the time the child was three years old is reported in the second. Income at age 3 is relevant since this is the time when most children would enter Head Start or some other preschool. Rows 1-3 confirm that, relative to children who attended other preschools or no preschool, Head Start children are disadvantaged both in terms of permanent income and income at a point in time.

A second fact, which is apparent from row 4 of Table 3, is that there is little within-family difference in household income at the time the child was age 3 between Head Start children and

those who never went to preschool, In contrast, rows 5 and 6 indicate that transitory income is associated with within-family movements between other preschool and no preschool, and also between Head Start and other preschool The within-family gap between preschool and no-preschool children is about \$6,000 among whites and \$8,000 among African-Americans. Similarly, the within-family gaps between other-preschool and Head Start children are \$5,000 and \$3,000 for whites and African-Americans, respectively.

These results show that, when family income rises, parents are more likely to send age-eligible children to preschool. Assuming that parents want to do what is best for their children, but are constrained by income, this finding suggests that a favored child would be more likely to be sent to preschool, other things being equal. We do not find any similar pattern for Head Start. Hence, there is some evidence consistent with the view that preschool children are actually more favored relative to their stay-at-home siblings than Head Start children, which implies that the difference between the estimated effects of Head Start and of preschool in the fixed-effects models discussed below may be an underestimate of the true Head Start premium.

IV. Estimation Results

Tables 4 and 5 present regression estimates of the effects of participation in Head Start and other preschools on the four child outcomes. In order to highlight the importance of controlling for observed and unobserved family-specific effects, three sets of estimates are presented in each case. "Unadjusted" ordinary least-squares (OLS) estimates [in columns (i)-(iii)] do not control for any observable covariates: this baseline shows the sample means. "Adjusted" OLS estimates [in columns (iv)-(vi)] do control for mother- and child-specific observables. Fixed-effects estimates [in columns (vii)-(ix)] also control for all unobserved time-invariant mother-specific effects in addition to child-specific observables.

All the regressions are estimated separately for whites and African-Americans; to facilitate comparisons between the two groups, difference between the estimated coefficients are reported in the third column in each panel. In each regression, the excluded category is children who did not attend preschool. The F statistic for the test that the estimated 'difference-in-difference' between Head Start and other preschool children is zero is reported just below each panel of estimates (along with the associated p value).

The observables in the "adjusted" OLS regressions include child age, gender, and whether the child was the first born, (log) household permanent income, the mother's education, her AFQT score, her height, the number of siblings in the mother's household when she was age 14, and the education of the maternal grandmother. The fixed-effects models include child age, gender, and whether the child is the first born, as well as household income at the time the child was age 3.

Table 4-Effect of Participation in Head Start and Preschool on PPVT Score and Absence of Grade Repetition

OLS - unadjusted OLS - adjusted Mother fixed effects

Variable White African-American Difference White African-American Difference White African-American Difference (i) (ii) (iii) (iv) (v) (vi) (vii) (viii) (ix)

A. Dependent Variable: PPVT Score

Head Starta -5.621 1.037 -6.658 -0.383 0.739 -1.122 5.875 0.247 5.628

(1.570) (1.223) (1.990) (1.453) (1.135) (1.844) (1.520) (1.358) (2.038)

Other 9.077 2.007 7.070 1.679 -0.790 2.469 1.173 0.615 0.557 preschoolb (1.275) (1.481) (1.955) (1.171) (1.311) (1.759) (1.296) (1.296) (1.833)

Constant 31.512 13.762 17.749 -106.706 -49.21 -57.505 . . .

(0.783) (0.823) (1.136) (16.306) (15.846) (22.737)

F 75.38 0.40 36.22 1.56 1.21 2.77 7.45 0.06 4.81 (Head [0.00] Start [0.53] [0.00] [0.21] [0.27] [0.10] [0.01] [0.81] [0.03] = preschool)

F (all 43.62 0.99 133.49 71.51 15.70 79.78 3.75 3.13 4.31 covariates) [0.00] [0.37] [0.00] [0.00] [0.00] [0.00] [0.00] [0.00] [0.00]

R2 0.03 0.01 0.14 0.27 0.19 0.34 0.73 0.68 0.75

Sample 2,319 1,158 3,477 2,319 1,158 3,477 2,319 1,158 3,477 size

B. Dependent Variable: Probability Never Repeated Grade

Head Starta -0.035 -0.010 -0.025 0.004 0.000 -0.004 0.473 0.008 0.465

(0.058) (0.061) (0.084) (0.061) (0.064) (0.088) (0.122) (0.098) (0.158)

Other 0.029 -0.069 0.098 -0.005 0.100 0.095 0.061 0.163 -0.102 preschoolb (0.062) (0.085) (0.104) (0.063) (0.088) (0.106) (0.099) (0.125) (0.158)

Constant 0.654 0.537 0.118 0.487 0.049 0.572 . . .

(0.031) (0.043) (0.052) (0.810) (0.882) (1.191)

F 0.76 0.47 1.20 0.02 1.30 0.61 8.40 1.22 8.05 (Head Start [0.38] [0.49] [0.27] [0.90] [0.26]
[0.44] [0.01] [0.27] [0.01] = preschool)

F (all 0.39 0.34 2.82 2.50 1.15 2.21 3.57 1.26 2.35 covariates) [0.68] [0.72] [0.02] [0.00] [0.32]
[0.00] [0.00] [0.28] [0.01]

R2 0.01 0.01 0.01 0.08 0.05 0.08 0.62 0.59 0.61

Sample 414 314 728 414 314 728 414 314 728 size

Notes: Standard errors are reported in parentheses below the coefficients; p values are given in brackets below the F statistics. Variance-covariance matrices were estimated by the method of infinitesimal jackknife for PPFT scores. OLS-adjusted regressions include controls for child age, gender, and whether first born, (log) household permanent income, mother's education, mother's AFQT score, mother's height, number of siblings when the mother was age 14, and grandmother's education. Fixed-effect models include controls for child age, gender, whether first born, and household income at age 3.

aDummy variable = 1 if participated in Head Start

bDummy variable = 1 participated in other preschool.

A. Measurers of Academic Performance

The first three columns of panel A in Table 4 indicate that the PPVT scores of white children are, on average, about twice those of African-American children. In part, this is a reflection of the fact that whites live in higher-income households than African-Americans. But that is only part of the story since nonparametric estimates indicate that white children have higher PPVT scores at all income levels (Currie and Thomas, 1993).

Within racial groups, white children who attended other preschools or no preschool tend to score better, on average, than Head Start children. For example, white Head Start children score an average of 5 percentile points lower on the PPVT than white children who did not attend preschool and 15 percentile points lower than whites who attended other preschools. Both of these differences are statistically significant. In contrast, there are no statistically significant differences among African-Americans.

Table 5-Effect of Participation in Head Start and Preschool on Measles Immunization and Height for Age

OLS - unadjusted OLS - adjusted Mother fixed effects

Variable White (i) African-American Difference White African-American Difference White African-American Difference (ii) (iii) (iv) (v) (vi) (vii) (viii) (ix)

A. Dependent Variable: Probability of Measles Immunization

Head Starta 0.152 0.167 -0.015 0.030 0.072 -0.043 0.082 0.094 -0.011

(0.025) (0.026) (0.037) (0.019) (0.020) (0.028) (0.030) (0.033) (0.045)

Other 0.021 -0.018 0.039 0.044 0.003 0.041 0.123 0.050 preschoolb (0.018) (0.029) (0.035)
(0.015) (0.022) (0.027) (0.024) (0.034) (0.042)

Constant 0.698 0.714 -0.016 0.256 0.268 0.012 . .

(0.011) (0.017) (0.021) (0.207) (0.280) (0.356)

F 24.85 35.50 1.67 0.48 8.23 6.58 1.42 1.21 (Head Start [0.00] [0.00] [0.20] [0.49] [0.00] [0.01]
[0.23] [0.27] [0.11] = preschool)

F (all 19.01 25.30 18.53 240.01 89.48 129.37 3.10 3.27 covariates) [0.00] [0.00] [0.00] [0.00]
[0.00] [0.00] [0.00] [0.00] [0.00]

R2 0.01 0.03 0.02 0.45 0.47 0.46 0.69 0.68

Sample 2,829 1,336 4,165 2,829 1,336 4,165 2,829 1,336 size

B. Dependent Variable: Height for Age (Percentage of Median)

Head Starta -0.171 1.024 -1.195 -0.207 0.452 -0.660 0.084 0.549 -0.465

(0.330) (0.382) (0.505) (0.328) (0.364) (0.490) (0.399) (0.540) (0.671)

Other 0.927 0.477 0.450 0.719 0.320 0.393 0.582 0.182 preschoolb (0.265) (0.485) (0.553)
(0.264) (0.475) (0.543) (0.318) (0.509) (0.600)

Constant 99.627 100.694 -1.067 63.214 55.666 7.548 99.895 97.708

(0.166) (0.278) (0.324) (4.144) (6.030) (7.318) (2.570) (4.139)

F 9.71 1.32 7.72 6.10 0.08 3.08 1.25 .034 (Head Start [0.00] [0.25] [0.01] [0.01] [0.78] [0.08] [0.26] [0.56] [0.26] = preschool)

F (all 7.54 3.60 12.57 14.03 11.15 13.61 1.95 1.89 covariates) [0.00] [0.03] [0.00] [0.00] [0.00] [0.00] [0.00] [0.00] [0.00]

R2 0.01 0.01 0.01 0.06 0.09 0.08 0.58 0.56

Sample 2,789 1,303 4,092 2,789 1,303 4,092 2,789 1,303 size

Notes: Standard errors are reported in parentheses below the coefficients; p values are given in brackets below the F statistics. Variance-covariance matrices were estimated by the method of infinitesimal jackknife for height-for-age. OLS-adjusted regressions include controls for child age, gender, and whether first born, (log) household permanent income, mother's education, mother's AFQT score, mother's height, number of siblings when the mother was age 14, and grandmother's education. Fixed-effect models include controls for child age, gender whether first born, and household income at age 3.

aDummy variable = 1 if participated in Head Start

bDummy variable = 1 participated in other preschool.

Moving across the columns in panel A in Table 4 shows the importance of controlling adequately for all observed and unobserved family characteristics associated with selection into Head Start. Column (iv) suggests that, among whites, the difference between the PPVT scores of Head Start and other children disappears when observables are controlled.

However, column (vii) demonstrates that when unobserved differences between families are controlled, using mother fixed effects, participation in Head Start is actually associated with a significant 6-percentile-point increase in the PPVT score relative to no preschool, while participation in other preschools has no statistically significant effect on test scores. The gap between the effects of Head Start and other preschools is statistically significant. The difference between columns (iv) and (vii) indicates that, consistent with Haskin's (1989) observations, it is the most disadvantaged white children in terms of unobservables who are selected into the Head Start program. On the other hand, controlling for unobservables has little effect on the estimated coefficient for other preschools, once observable characteristics are included in the model.

The results for African-Americans indicate that selection may be less important for them: there are no statistically significant effects of Head Start or preschool in any of the three specifications. Column (ix) shows that the difference between the Head Start effects for whites and African-Americans is large - nearly 6 points - and statistically significant.

We turn next to our second measure of academic performance: absence of grade repetition. The first three columns of panel B in Table 4 show that about one-third of white and nearly half of African-American sample children age 10 or older are reported to have repeated a grade. Although white Head Start children are about 20 percent more likely to have repeated a grade than white children who attended other preschools, this difference is not statistically significant. Among African-Americans, the gaps between the different groups of children are even smaller. The OLS estimates in columns (iv)-(vi) also indicate that there are no statistically significant effects of type of preschool on the probability of grade repetition.

However, the fixed-effects estimates, shown in columns (vii)-(ix) indicate that whites who attended Head Start are 47 percent less likely to repeat a grade, relative to their siblings who did not attend preschool. Those who attended another type of preschool are no less likely to have repeated a grade than their siblings who stayed at home. The "difference in differences," that is, the gap between the effect of Head Start and the effect of preschool, is also large (40 percent) and statistically significant (p value = 0.01).

In contrast, attendance at either type of preschool has no statistically significant effect on the probability of grade repetition among African-Americans (although the point estimate of the coefficient on the other preschools is large). Once again, the racial difference in the impact of Head Start is statistically significant.

In sum, after controlling for mother-specific observables and unobservables we find that, for whites, the academic performance of Head Start children is significantly better than that of siblings who stayed at home. In addition, the estimated effects of Head Start are much greater than those of attending other preschools once both observable and unobservable characteristics of families are controlled. Among whites, this difference-in-difference estimate is statistically significant both for PPVT scores and for grade repetition. Among African-Americans, however, the tale is more dismal: neither Head Start nor other preschools is associated with enhanced academic performance.

B. Measurers of Health Status

Table 5 presents the estimated effects of participation in Head Start and other preschools on two measures of health status: immunization probabilities and height-for-age. The first three columns of panel A suggest that both whites and African-Americans are about 15-percent more likely to have had a measles shot if they attended Head Start rather than another preschool. These gaps are statistically significant. There is little difference in these means between the other-preschool and no-preschool children, which is surprising in light of the differences in family background between these two groups. For both racial groups, the difference in differences between Head Start and other preschool children is statistically significant.

Column (iv) shows that, among whites, controlling for observables reduces the effects of Head

Start to zero, while the effect of attending other preschools increases slightly and becomes statistically significant. Among African-Americans, the inclusion of observables reduces the Head Start advantage by over half, but it remains significant.

When fixed effects are included [in columns (vii) and (viii)], we find that Head Start is associated with an 8-9-percent higher probability of being immunized among both white and African-American children. Attendance at other preschools is also associated with a higher probability of being immunized. While the estimated coefficient on preschools is greater than the estimated effect of Head Start among whites, the difference is not statistically significant. Among African-Americans, the effect of other preschools is not significantly different from zero, but it is not significantly different from the coefficient on Head Start either. Relative to other preschools then, there is not health-care "premium" associated with Head Start.

The relationship between type of preschool and child height-for-age is presented in panel B of Table 5. The unadjusted OLS estimates [in columns (i) and (ii)] show that white children who attend preschools are significantly taller than other white children, but that African-American children who attend Head Start are taller still. The coefficient on preschool in column (ii) is not statistically significant. However, the hypothesis that Head Start and preschool have the same effect on the height-for-age of African-Americans cannot be rejected with any confidence.

When observables are controlled in column (iv) and (v), the preschool effect among whites is somewhat weaker, but it remains significant. A good part of the difference between columns (i) and (iv) is accounted for by the influence of maternal height, although other measures of maternal human capital (her education) are also statistically significant. This result suggests that height is influenced both by genetic factors and by parental investments in the health and human capital of children. The fixed-effects estimates for whites, in column (vii), eliminate the influence of all shared genetic characteristics as well as all other fixed maternal characteristics; this results in a further weakening of the relationship between preschool and child height, although it remains positive and significant, albeit at a 7-percent level.

Among African-Americans, the inclusion of observable maternal and child characteristics [in column (v)] cuts the positive correlation between Head Start and child height by more than half. It also becomes statistically insignificant. Similarly, column (viii) shows that we do not find any statistically significant effect of either Head Start or preschool when fixed effects are included in the model.

These results suggest that the positive correlation between Head Start and height-for-age among African-Americans that is noted in column (ii) reflects the selection of taller African-American children into the program. This impression was confirmed by estimating regressions of birth weight on participation in the program. Birth weight is highly correlated with future child height-for-age, but it could not possibly be influenced by future participation in Head Start. We found that African-American children who attended Head Start were heavier at birth than African-

American children who did not. For whites, however, we did not find any correlation between birth weight and enrollment in Head Start or preschool, so the positive effect of preschool on height-for-age appears to be a genuine program effect.

Thus, in spite of positive effects of attendance at Head Start or other preschools on the utilization of preventive health care, the large nutritional component of the Head Start program, and the fact that other preschools appear to have positive effects on growth of some children, we find not evidence that participation in Head Start has an effect on nutritional and health status as measured by height-for age.

C. Differences in the Effect of Head Start Among Whites and African-Americans

The cognitive effects of Head Start appear to vary dramatically by race, even when selection into the programs is taken into account: Head Start has a smaller effect on the test scores and schooling attainment of African-Americans than on the test scores and academic achievement of whites. Why does race matter?

One hypothesis is that there is heterogeneity in the Head Start programs that serve children of different races. While most programs are in compliance with most standards, slightly over 11 percent of Head Start operators monitored in 1993 were found to be out of compliance with 50 or more of 222 items reviewed, while another 18 percent needed improvement in 26 - 50 areas (U.S. Department of Health and Human Services, 1993). It is possible that African-American children are more likely to be served by inferior programs. Unfortunately, this hypothesis cannot be tested directly, as we have no information about individual programs.

An alternative hypothesis is that the benefits of compensatory education depend both on the program itself and on the child's home background, including, for example, the level of resources at home, as well as the type and quality of school attended after Head Start. To the extent that African-American children come disproportionately from more disadvantaged homes, located in poorer communities, and attend troubled schools, one might expect Head Start to have either smaller initial effects or effects that dissipate more quickly over time.

We begin to address these issues by estimating models that allow the effects of Head Start and other preschool attendance to vary with maternal AFQT and child age. These results are shown in Table 6. All of the models included fixed effects. We do not show results for height-for-age, since there were no significant effects of Head Start (or significant racial differences) to be explained.

Maternal AFQT can be regarded as an index of maternal background or of human capital. It is highly correlated with years of education, as shown in Figure 1, but has the advantage of being a continuous rather than discrete variable. If children from better backgrounds gain more from Head Start or preschool, then the interactions between AFQT and Head Start or preschool will

be positive.

The results in columns (i) and (ii) of panel A indicate that the positive effects of Head Start on PPVT increase with AFQT among both whites and African-Americans. However, neither interaction is statistically significant. The interactions between AFQT and preschool are also insignificant. Turning to the absence of grade repetition, column (iv) shows that, among whites, there is a large and statistically significant interaction between Head Start and AFQT: a 10-point increase in the normalized maternal AFQT score reduces the probability of failure among Head Start Children by 8 percent. We do not find any similar effect among African-Americans [column(v)]. Moreover, the differences between whites and African-Americans in the AFQT X Head Start interaction is significant (at the 8 percent level) [column (vi)]. We do not find any significant interactions between preschool attendance and AFQT for either race.

Finally, the results shown in columns (vii)-(ix) indicate that, in the regressions for immunization probabilities, interactions between Head Start and AFQT and between other preschools and AFQT are all positive but not statistically significant. In sum, there is weak evidence that children from better backgrounds, as measured by maternal AFQT, gain more from Head Start, but the interaction is only statistically significant in the regressions for absence of grade repetition among whites.

Interactions between the type of preschool and child age allow us to address the question of whether the effects of Head Start and other preschools persist as the child grows older. These estimates are reported in panel B of Table 6. Columns (i) and (ii) contain one of our most interesting results. Not only is the direct effect of Head Start large, positive, and significant for both whites and African-Americans, but the effect (of nearly 7 percentile points) is essentially identical for both racial groups.

This finding stands in sharp contrast with the results discussed above. In Table 4 we found that Head Start was associated with higher PPVT scores among whites but that African-American children did not enjoy similar benefits. The difference lies in the age interactions while the interactions are always negative, for whites they are small and statistically insignificant, while for African-Americans they are large and significant. Thus, for example, by age 10 African-American children have lost any benefits they gained from Head Start, while 10-year-old white children retain a gain of 5 percentile points. There is no evidence of a similar interaction effect among children who attend preschool.

Our results for African-Americans are thus consistent with those of earlier studies (which tended to be dominated by African-American subjects). When we focus on only young African-American Children, we find clear benefits of Head Start. However, in a sample of African-American children of all ages there is no effect of Head Start. This is because the benefits die out very quickly. In contrast white children experience the same initial gains from Head Start but they retain these benefits for a much longer period.

It is also possible to ask whether the rate at which the benefits of Head Start dissipate among African-Americans depends on the environment at Home. To do this, we have estimated models (not shown) that include "triple interactions" among age, Head Start and maternal AFQT. If children from better backgrounds retain the gains from Head Start longer, then this triple interaction will be positive (offsetting the fact that the beneficial effect declines with age). We

Table 6-Fixed-Effects Estimates of Impact of Head Start and Preschool on Child Well-Being, Including Interactions with Maternal Human Capital and Child Age

Dependent variable: Dependent variable: Dependent variable:

PPVT score probability never repeated grade probability of measles immunization

Variable White African-American Difference White African-American Difference White African-American Difference (i) (ii) (iii) (iv) (v) (vi) (vii) (viii) (ix)

A. Include interactions with AFQT of mother:

Head Starta 4.826 -0.462 5.288 0.123 -0.006 0.130 0.046 0.083 -0.036

(2.136) (1.821) (2.807) (0.186) (0.146) (0.239) (0.047) (0.050) (0.069)

Head Start

X AFQT of 2.032 2.103 -0.072 0.831 0.040 0.791 0.060 0.030 0.029 mother (3.352) (4.810) (5.863) (0.323) (0.316) (0.452) (0.062) (0.099) (0.119)

Other 2.278 -1.300 3.578 0.217 0.210 0.007 0.086 0.048 0.038 preschoolb (2.170) (1.483) (2.628) (0.204) (0.192) (0.281) (0.044) (0.049) (0.067)

Other preschool

X AFQT of -1.396 4.545 -5.941 -0.203 -0.135 -0.068 0.045 0.007 0.038 mother (2.724) (3.764) (4.647) (0.246) (0.419) (0.473) (0.044) (0.062) (0.095)

F (Head 7.72 0.10 3.39 11.48 0.01 5.39 4.04 4.00 0.16 Start and interaction) [0.00] [0.91] [0.03] [0.00] [0.99] [0.01] [0.02] [0.02] [0.85]

F 0.74 0.74 1.04 0.59 0.89 0.02 14.14 1.12 0.87 (Preschool and [0.48] [0.48] [0.35] [0.56] [0.41] [0.98] [0.00] [0.33] [0.42] interaction)

F (all 3.74 3.12 4.29 3.79 0.95 2.26 154.10 80.26 117.00 covariates) [0.00] [0.00] [0.00] [0.00]
[0.48] [0.00] [0.00] [0.00] [0.00]

R2 0.73 0.68 0.75 0.63 0.59 0.62 0.69 0.68 0.69

B. Include Interactions with Age of Child:

Head Starta 6.878 6.845 0.033 0.266 0.218 0.048 0.266 0.258 0.008

(2.397) (1.933) (3.080) (0.311) (0.295) (0.429) (0.045) (0.048) (0.067)

Head Starta -0.192 -1.278 1.086 0.025 -0.025 0.050 -0.043 -0.035 -0.008

X age of (0.410) (0.309) (0.513) (0.036) (0.033) (0.049) (0.008) (0.007) (0.011) childc

Other 0.165 2.970 -2.805 0.173 0.726 -0.553 0.128 0.045 0.083 preschoolb (1.832) (1.863)
(2.613) (0.350) (0.461) (0.572) (0.031) (0.046) (0.057)

Other preschool 0.264 -0.467 0.731 -0.014 -0.074 0.061 -0.002 0.002 -0.004

X age of (0.362) (0.386) (0.529) (0.041) (0.059) (0.071) (0.006) (0.009) (0.011) childc

F (Head 7.89 8.86 5.26 7.68 0.29 4.78 18.53 15.00 0.48 Start and interaction) [0.00] [0.00]
[0.01] [0.00] [0.75] [0.01] [0.00] [0.00] [0.617]

F 0.64 1.27 0.96 0.25 1.69 0.50 13.73 1.21 1.46 (Preschool and [0.53] [0.28] [0.38] [0.78] [0.19]
[0.61] [0.00] [0.30] [0.23] interaction)

F (all 3.74 3.19 4.31 2.76 1.17 1.92 160.23 85.57 122.61 covariates) [0.00] [0.00] [0.00] [0.01]
[0.32] [0.02] [0.00] [0.00] [0.00]

R2 0.73 0.68 0.75 0.62 0.59 0.61 0.69 0.69 0.69

Notes: Standard errors are reported in parenthesis below the coefficients; p values are given in brackets below the F statistics. The variance-covariance matrix for PPVT models was calculated by the method of infinitesimal jackknife. All models include controls for child age, gender, whether first born, and household income at age 3.

aDummy variable = 1 if participated in Head Start

bDummy variable = 1 participated in other preschool.

cAge of child is expressed as years since age 5.

found no evidence for this hypothesis: the coefficient on the triple interaction was -0.04 with a t statistic of 0.09. To the extent that the maternal AFQT score does capture home background, this suggests that at least part of the racial difference in the benefits of Head Start reflects heterogeneity in program delivery or in the types of schools that whites and African-Americans attend once they leave the program.

Columns (iv)-(vi) of panel B in Table 6 indicate that there are no statistically significant interactions between age and type of preschool in the regressions for absence of grade repetition. In part, this reflects the fact that the question was only asked of children over 10 years old, so there is relatively little variation in the age ranges of the respondents.

Older children who attended Head Start are less likely to have been immunized, as shown in columns (vii)-(ix) of panel B in Table 6. This could be due to recall error, if parents of older Head Start Children tend to forget that a child has been immunized. However, if the result reflects recall error, than one might expect the same pattern among children who went to preschool, and there is no evidence in support of this "forgetting hypothesis" among these children. Thus, it is likely that the result reflects an increasing emphasis on the health-care portion of the Head Start program in recent years.

Since, within families, the firstborn must be the oldest, it may be that differences in the impact of Head Start among children of different ages is picking up a birth-order effect. Adding interactions between type of preschool and whether the child is the firstborn does not affect the inferences discussed above. However, these interactions do provide some information about the extent of spillover to other siblings.

If the benefits of Head Start spill over from older to younger siblings, then in the fixed-effects estimates, the firstborn will appear to have gained the least from the program, and an interaction between Head Start and firstborn will be negative. The point estimates on these interactions are indeed negative for all four outcome measures, and for both races. The interactions are statistically significant in the case of measles shots, and outcome for which information externalities are likely to be very important. These might reflect parental learning about the importance of immunizations or learning about health resources available in the community. Among African-Americans, the Head Start X firstborn interaction is also significantly negative for PPVT scores. In contrast, the evidence for spillovers from older siblings who attended other preschools is weaker. This suggests, that if anything, the difference-in-difference estimates of the effects of Head Start relative to preschool tend to understate the positive impact of Head Start.

V. Discussion and Conclusions

In closing, we offer some observations about the likely importance of the effects we have identified. Participation in Head Start is associated with an increase in the PPVT scores of white children of 5.6 percentile points. Table 4 indicates that the gap in PPVT scores between Head Start children and those who attended other preschools is 15 points. Hence, our results suggest that Head Start closes over one-third of the age gap between children attending the program and their more advantaged peers. Moreover, contrary to many previous studies, we find that this beneficial effect persists at least into adolescence among white children. We also find that white children over nine years old who attended Head Start are 47 percent less likely to have repeated a grade than other white children. Given that 35 percent of white children who did not attend preschool repeated a grade, this translates into a reduction of 16 percentage points in the probability of repeating a grade. A gain of this size more than closes the gap between white Head Start children and their peers who attended other preschools.

It is difficult to evaluate the long-run impacts of the gains in test scores. As discussed above, previous research indicates that children who perform poorly in early grades are more likely than other children eventually to drop out of school altogether. However, it is not clear to what extent this relationship is causal. Nevertheless, we can take some representative estimates from the education literature and extrapolate using our data. Ensminger and Slusarcick (1992) find that children who received C's and D's in Grade 1 are twice as likely to drop out of school as children who received A's and B's. Assuming that the wage gain to an additional year of high school is 8 percent, that most children would drop out in grade 11, and that the increase in test scores we find would be enough to move a child from a C to a B average, enrolling a white child in Head Start could increase his or her expected future wage by 4 percent.

We are on somewhat firmer ground evaluating the likely effects of reductions in the probability of grade repetition. In a study of more than 140,000 students from three different school districts, Grissom and Shepard (1989) found that students who were retained in grade were 30 percent more likely to drop out of school, even when achievement on standardized tests, socioeconomic status, gender, and ethnicity were controlled. They also found that grade repetition was disproportionately concentrated in early grades, and especially first grade, which means that their findings should be relevant to our sample. Hence, the 16-percentage-point decline in the probability of repeating a grade associated with Head Start could lead to a 5 percent decline in the probability of dropping out of high school among white children.

It is notable that enrollment in other preschools has no significant effects (positive or negative) on test scores or on the probability of grade repetition among white or African-American children. For whites, the differences between the effects of Head Start and those of preschool are statistically significant. Given that children in Head Start are disadvantaged relative to even their own siblings, the fact that Head Start has bigger effects than preschool strongly suggests that our estimates are capturing a genuine effect of the program rather than selection bias.

Turning to the effects on the utilization of health care, and on health status, we find that both white and African-American children are 8-11-percent more likely to be immunized if they attended either Head Start or another preschool than if they attended no preschool. These results are consistent with those surveyed in McKey et al. (1985) because they suggest that children in Head Start are gaining access to preventive health care. Once again, it is difficult to place a value on these services. An upper bound is provided by the average cost of providing outpatient services to an AFDC (Aid for Families with Dependent Children) child covered by Medicaid, or \$468 per year in 1990 (U.S. House of Representatives, 1992).

It may be objected that the provision of preventive services under the auspices of Head Start duplicates coverage available to many poor children under the Medicaid program and that, therefore, these additional services have little value. However, only 39 percent of eligible children participate in the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) component of the Medicaid program (U.S. Department of Health and Human Services, July 1990), and in the District of Columbia less than half of Medicaid-eligible children receive all their immunizations despite the fact that new mothers receive written reminders (Washington Post, 1993). Furthermore, in contrast to the results reported here, we found no evidence that Medicaid coverage increased immunization rates in the NLSCM. Hence, we suggest that the possibility that the Head Start program plays an important role in the provision of preventive services cannot be dismissed out of hand.

Finally, we turn to the \$2.2 billion question-is the money spent on Head Start a worthwhile investment, or are there less expensive ways of providing similar benefits? The results for African-American children suggest that the primary long-term benefits of Head Start are in terms of access to health care. Hence, it is appropriate to compare Head Start's price tag of \$3,500 per child to the \$468 estimate for health services cited above. This comparison suggests that when viewed strictly in terms of lasting benefits provided to children, Head Start programs serving African-American children are not cost-effective. Whether this result reflects inadequacies in these programs, or the limited opportunities available to African-American children after they leave the program, is sure to be a hotly debated question.

In contrast, the results for white children suggest that the potential gains are much larger than the costs, since even a small decline in the high-school dropout rate has the potential to pay for itself in terms of future wage gains. If the factors preventing African-American children from maintaining the gains they achieve in Head Start could be removed, the program could probably be judged an incontrovertible success.

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Ideology and Censorship in Behavior Genetics

by Prof. Glayde Whitney (Past President Behavior Genetics Association Florida State University, Tallahassee, Florida)

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Presented below is the entire text of my presidential address presented to the Behavior Genetics Association (BGA) on the occasion of its 25th annual meeting at Richmond, VA on the second of June, 1995. Since the journal Behavior Genetics is sponsored by the BGA, some explanation is required as to why this presidential address is not published in the Association's own journal.

The primary topic of the address was ideologically-based dogma and taboo hampering the pursuit of knowledge in the science of behavior genetics. The response to the address has been such a parody of political correctness that it might appear to be an instance of collusion between the perpetrator and the detractors for the purpose of exposing an absurdity of our times. However sadly, there is no collusion. Both the author and the detractors appear to be sincere.

The address was presented at an evening banquet. The very next morning at a meeting of the BGA Executive Committee the author was shunned except for a brief scolding, and was the recipient of demeaning ad hominem asides. The Executive Committee busied itself with how to distance the BGA from the offensive talk. The editor of Behavior Genetics refused to publish the paper (contrary to understood policy) and the Executive Committee voted (with one abstention - mine) to issue an official statement of denouncement. Then shortly after the meeting there began a call for the author to resign from the BGA. As stated in a public mention of the affair (Science, 1995), officers of the BGA, and a few others, began to post condemnatory "open letters" on the BGA's electronic bulletin board.

The issuers of these calls for resignation seem to have lost track, in the finest Lysenkoist tradition, of the many distinctions between scientific organizations and political/religious organizations. Scientific organizations are composed of scientists with some common interests, wherein science consists of alternative hypotheses, the truth value of which is judged by their congruence with observable data. Typical as a scientific organization, the BGA bylaws state purposes which include the promotion of scientific study, assistance in training of research workers, and dissemination of knowledge. Nowhere in the BGA bylaws is there a creed or a listing of necessary beliefs.

On the other hand, political/religious organizations usually have an official creed, or party platform, to which members swear fealty. Those heretics that violate the faith are typically shunned, expelled, or forced to resign. Science has no heretics, and honest science does not thrive in an atmosphere of inquisitorial control (Whitney, 1995). A century ago Andrew White (1896/1965) wrote an excellent historical account of the warfare between science and ideology. Although the battlefields shift, the war continues.

It would be highly misleading to leave the impression that the author is alone, adrift in a sea of condemnation. On the contrary, private letters of support and commendation greatly outnumber the public critics. In view of the attempt. at censorship, I greatly appreciate the editors of The Mankind Quarterly providing an archival repository for the address:

Twenty-Five Years of Behavior Genetics

Today there are more and better data concerning genetic influences on behavioral and neuroscience variables than ever before in history. We have tremendously benefited from the revolution in molecular genetic techniques - the new genetics. In 25 years behavior genetics has come from being a small field on the fringe of the social sciences to being recognized as central to an understanding of the human condition (Wiesel, 1994). Just a few weeks ago Science noted that the new director of NIMH should be someone who appreciated the role of genetics in mental health (Marshall, 1995). This is an amazing shift from 25 years ago when behavioristic environmental determinism still reigned supreme. We are obviously well into a paradigm shift of major dimensions, perhaps a true Kuhnian revolution in Science and Society (Barker, 1985; 1992; Kuhn, 1970). In the future it might be referred to as the Galtonian Revolution, on a par with the Copernican. The shift is but one illustration of the long-term self-correcting nature of science: Objective investigation of the real world, conducted with integrity and interpreted without intentional ideological bias, can eventually lead to real advance.

As has sometimes been the case for these after dinner talks, I want to take just a few minutes to share with you some personal reminiscences and some personal views. Twenty-five years ago I got my first full-time faculty position. This was after student days at Minnesota, a bit of a time-out for military service, and a post-doctoral stint in Colorado. At Colorado the Institute for Behavioral Genetics was a wonderful setting. Gerry McClearn and John DeFries, along with Jim Wilson, were running the place. There were a bunch of stimulating graduate students around: I recall Tom Klein studying the taste of mice and Boris Tabakoff messing with alcohol. Doug Wahlsten and I were side-by-side post-docs, Joe Hegmann had just left and Carol Lynch was just arriving. Wonderful friends and colleagues, all of them. The best of days in a stimulating environment.

Well then, I got hired to represent behavior genetics in the neuroscience program at Florida State University. A good program but vastly different in orientation. Not a lot of geneticists. I was there only a brief time when one of the old-timers who ran the place came by for a friendly chat.

As polite southerners do, he began with a lengthy discussion of weather, trees, traffic, chiggers, and children. And then, finally, by-the-way, he said "Gladye, you know we hired you because we want genetics in our psychology program, but, as a Professor at a southern university, we hope you will have the good sense to keep away from that human business. Because of your location you would have no credibility, and none of us need the flak"!

Well. That in fact was consistent with my plans, I was busy setting up a mouse laboratory at the time and sure-enough had enough good sense to do passably well with mouse research. After all, I've still got the job and I've been invited here tonight.

To understand my mentor's concern, we need to view it in historical context. 1970 was an interesting time. Tallahassee, being a state capital with two state universities, had already had its share of demonstrations, riots, burning and looting. It was in 1970 that Black Panther supporters got around to killing jurors and a judge; 1970 that a mathematics building was bombed on the campus at Wisconsin, also with loss-of-life (Collier & Horowitz, 1995).

It was also in 1970 that our colleague Arthur Jensen was taking a lot of flak (Pearson, 1991). As everyone in behavior genetics knows, Jensen published an interesting review paper in 1969 (Jensen, 1969). Interesting but hardly ground breaking. As a student at Minnesota, I had had the course in differential psychology. With interesting textbooks (Anastasi, 1958; Jenkins & Paterson, 1961) and team taught by such professors as Lykken and Meehl. We had considered fifty years worth of data, and various interpretative theories. Jensen in 1969 had a few new data, by-and-large consistent with all that had gone before. No big deal scientifically, at least not to any student of behavior genetics from Minnesota. But obviously a great big deal in some circles.

Over the intervening twenty-five years it has become obvious that Jensen's sins were, and continue to be, two-fold. First, he did not stay within the confines of a reigning dogma, and second, he violated a current taboo.

The dogma of course is that of environmental determinism for all important human traits. This dogma has relaxed in recent years, at least for individual differences, and at least within science. But the dogma has not relaxed for group differences and has not relaxed within politics as differentiated from science. The attacks on Jensen, and by extension on all human behavior genetics, are clearly political, ideological, philosophical.

The Marxist-Lysenkoist denial of genetics, the emphasis on environmental determinism for all things human, is at the root of it (Davis, 1986; Medvedev, 1971; Pearson, 1991; Weiss, 1991). Economic oppression is at the root of all group differences and don't you dare say anything else. The Marxist invasion of left-liberal political sentiment has been so extensive that many of us think that way without realizing it.

It has been suggested that I should talk about "Marxitis" that is, the Marxist infection of ideas.

Many of the scholars that suffer from Marxitis do not realize that they are infected. The symptoms of this disease include an intellectual bias, an insistence on environmental determinism as the acceptable cause of group differences. In severe cases, it includes an unbending intellectual absolutism akin to medieval scholasticism. It is lethal to honest science.

A couple of quotes from heretics that have left the movement: "the utopianism of the Left is a secular religion However sordid Leftist practice may be, defending Leftist ideals is, for the true believer tantamount to defending the ideals of humanity itself. To protect the faith is the highest calling of the radical creed. The more the evidence weighs against the belief, the more noble the act of believing becomes" (Collier & Horowitz, 1995, p. 246).

There is a "readiness to reshape reality to make the world correspond to an idea" (Collier & Horowitz, 1995, P. 37). There is a "Willingness to tinker with the facts to serve a greater truth" (Collier & Horowitz, 1995, p. 37). And so it has obviously been with many of the critics of behavior genetics. Over the last twenty-five years, as the scientific data accumulate, as the paradigm shifts, the stridency of the critics intensifies. Driven by ideology and not constrained by the truth, when all else fails they engage in misrepresentation and character assassination. They accuse their targets of committing the very propagandistic excesses that they themselves are doing (Avery, et. al., 1994; Beardsley, 1995; Brimelow, 1994; Gould, 1994; Kamin, 1995; Lane, 1994; Miller, 1994; Murray, 1994; Weyher, Lynn, Pearson, & Vining, 1995).

Some one among them coined the term "Jensenism". Near as I can tell "Jensenism" consists of scientific integrity, outstanding technical competence, and objective honesty.

Well, Jensen's first sin was to venture outside the Left-Liberal Marxist dogma of environmental determinism. His second sin was even less forgivable, he violated a Taboo: He mentioned race outside the environmental envelope. The Behavior Genetics Association has been in existence for 25 years. The end of the Second World War was 50 years ago. Peter Brimelow (1995) has suggested that since the second world war we have been suffering what he calls "Adolf Hitler's posthumous revenge on America" (Brimelow, 1995, p. 1). The posthumous revenge is that the intellectual elite of the western world, both political and scientific, emerged from the war "passionately concerned to cleanse itself from all taints of racism or xenophobia" (Brimelow, 1995, p. xv). The aversion to racism has gone so far that the scientific concept of race itself is frequently attacked. The results are often ludicrous. For example, on three adjacent pages of a recent issue of Science we are led to believe that races do not exist, but that it is important to assess the genetic diversity of remaining native populations, and a black scientist at a black university should be funded to investigate the black genome as a route to appropriate treatment of diseases of blacks! (Kahn, 1994). The many and important distinctions between objective investigation of group characteristics, and prejudicial pejorative values are lost in a political atmosphere where objective reality is sacrificed to political creed.

Brimelow suggests that the term "racist" is now so debased that its new definition is "anyone

who is winning an argument with a liberal" . (Brimelow, 1995 p. 10, italics in original). He suggests that we feel uneasy because we have been trained - like Pavlov's dog - to recoil from any explicit discussion of race.

Let's test Brimelow's theory of emotional conditioning with just a couple of illustrations of data. Here and now is the setting for our experimental test. Here we are scientists, sophisticated with regard to behavior genetics. We tell our students that we are the scientists concerned with the causes of individual and group differences (Fuller & Thompson, 1978; Rowe, 1994). Any time you observe a phenotypic difference between definable groups, it is a reasonable scientific hypothesis that the difference might be caused by environmental difference between the groups, or the difference might be caused by genetic differences between the groups, or by some combination of genetic and environmental differences. Elementary.

Now to look at the data relating to the Brimelow test, we include five figures.

The first figure has data from a UN demographic yearbook (United Nations, 1994). The variable here is murder rate per 100,000 of population, for a few countries. This is a typical representative figure: Among so-called advanced nations, or industrialized nations, the United States suffers a high murder rate. The environmental determinists have many theories, some complex and all critical to aspects of American society. Often we are asked, for instance, "why are Scandinavians in the U.S. so much more murderous than are Scandinavians in Scandinavia?" The answer is that they are not. The premise of the question is false.

The second figure has the same "industrialized" European, largely Caucasian, countries along with an estimate of the murder rate among whites in the U.S. Surely nothing to be proud of, the murder rate among whites is pretty consistent across countries, the rate among U.S. Caucasians is identical to England, and somewhat lower than the two Scandinavian countries. The United States is of course a multicultural, racially diverse country. This same point has been made previously, with data from different sources (Taylor, 1994).

The third figure has the murder rate for the United States across 22 years, by race. Obviously quite consistent, approximately a 9-fold difference averaged across years (Uniform Crime Reporting Program, 1988).

Like it or not, it is a reasonable scientific hypothesis that some, perhaps much, of the race difference in murder rate is caused by genetic differences in contributory variables such as low intelligence, lack of empathy, aggressive acting out, and impulsive lack of foresight.

The United Nations has a lot of indexes; another one is the HDI (that is, Human Development Index). The HDI is meant to index a bunch of desirable characteristics (such as longevity, knowledge, real income, etc.). Overall, the U.S. ranks fifth among the nations in the HDI. To get fifth on the international list, you combine U.S. whites, who rank first, with US blacks who rank

31st, a level similar to some other black countries (Eisenberg, 1995), and this after more than a generation of racially preferential social policies. If you equate for IQ, U.S. blacks are actually doing at least as well as U.S. whites (Herrnstein & Murray, 1994).

Back to murder rates. Environmental determinists seem generally befuddled by murder, and most of their social policy suggestions, when implemented, seem to make matters worse rather than better. Of course environments do matter, and environmentalistically based policies do have an impact. In 1994, the murder rate in New Orleans, LA, reached 86.5, while in Richmond, VA, the murder rate was 77.9, for second-worst large city in the United States (Perlstein, 1995). Obviously, the environmental determinists are not benign; they do not occupy a moral high ground; their policy recommendations do have consequences.

We can do a pretty good job of predicting differential murder rates, simply by considering racial composition of the population. For example, in the fourth figure we have aggregate data across the 50 states of the United States. The simple correlation between murder rate and percent of the population that is black, is $r = +0.77$. For Figures 4 and 5, the homicide data are from the U.S. Department of Justice (1981), while the population percentages are from the 1980 census (Race, 1981). I know of no environmental variable that accounts for more of the variation. Rather than the 50 states, we can look at all of the 170 cities in the United States that had a 1980 population of at least 100,000. With 170 data points, it would make a messy scatter-plot; the overall correlation between murder rate and percent of the population which is black is $r = +0.69$ (Kleck & Patterson, 1993; Kleck, 1995).

Simply for illustrative purposes, the fifth figure is the rate-by-state as in figure 4, but with the values for Washington, DC included. As you can see, the very high murder rate for Washington, DC is simply what one would predict, given knowledge of its population composition.

We could go on-and-on, there are books-full of variables (Baker, 1981; Rushton, 1995). But this is enough to conclude the Brimelow Test.

Do you have an emotional reaction? I know I do: Uncomfortable to even consider; Anxious; Repulsed; Upsetting. I conclude that I have been quite thoroughly conditioned. The Taboo against considering race runs deep. But some of our social problems continue to get worse.

I would like to conclude on an uplifting and happy note. But what to say? Perhaps the optimistic prediction that over the next 25 years, as we get further into the second century of the Darwinian revolution, we in behavior genetics will do for group differences what we already have accomplished with individual differences.

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GRAPH: Figure 1. Murder rates per 100,000 of population for a few "industrialized" countries. Data are from the United Nations Demographic Yearbook, forty-fourth issue.

GRAPH: Figure 2. Murder rates per 100,000 of population for a sample of countries. The estimate of U.S. white rate is the average over 22 years from the U.S. Uniform Crime Reporting Program (1988). The values for other countries are from the U.N. Demographic Yearbook, forty-fourth issue.

GRAPH: Figure 3. Murder rates per 100,000 of population for the United States, by race, for the 22 years of 1965 to 1986. Data are from the U.S. Department of Justice, Uniform Crime Reporting Program.

GRAPH: Figure 4. Homicide rate per 100,000 of population, plotted against percent of the population that is black, for the 50 states of the United States. The homicide data are from the U.S. Department of Justice (1981), while the population percentages are from the 1980 census. The correlation is $r=+0.77$.

GRAPH: Figure 5. Homicide rate per 100,000 of population, plotted against percent of the population that is black, for the 50 states of the United States, as in Figure 4, with the addition of data for Washington, D.C. in upper right of the figure.

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FOR WHOM THE BELL CURVE TOLLS

A Prelude to an Upcoming Special Issue of Skeptic (Volume 3, #3)

An Interview with the Author of The Bell Curve

CHARLES MURRAY

Interview by Frank Miele

Charles Murray has achieved the impossible, or at least the highly improbable. He has co-authored an 845-page book, filled with figures, tables, references, and appendices loaded with multiple regression analyses, that is also the most controversial book in America. It has been panned by many outside the intelligence testing community and by some within. Commentators from the left, right, and middle have taken their best shots, and leaders of both major political parties have rung in with scathing attacks, even while admitting they had not read the book. Despite the brouhaha, or perhaps because of it, *The Bell Curve* made it to the New York Times top-10 nonfiction best seller list. As Ted Koppel put it on *Nightline*, *The Bell Curve* will be like Clinton's health plan: no one will actually read it but everyone will form an opinion of it.

Charles Murray is no stranger to controversy. His previous book, *Losing Ground: American Social Policy, 1950-1980*, argued that the Great Society programs of the 1960s not only did not help the poor, they often made things worse. Arguing that the welfare system should be abolished, the New York Times called *Losing Ground*, "The [Reagan] Administration's new 'bible.'" *Losing Ground* was but a prelude.

In *The Bell Curve: Intelligence and Class Structure in American Life* (co-authored with the late Richard J. Herrnstein, author of the previously controversial *IQ in the Meritocracy*, and co-author with James Q. Wilson of *Crime and Human Nature*), Murray has pushed the envelope of

public political discourse to its breaking point. He has now been dubbed by the New York Times Magazine "America's Most Dangerous Conservative." When editor Andrew Sullivan ran an excerpt from *The Bell Curve* in *The New Republic*, its entire editorial board rose in revolt. But a group of leading researchers in the field of human intelligence published a statement in the *Wall Street Journal* agreeing with the factual basis of *The Bell Curve*.

Herrnstein and Murray argue that IQ is real; that it matters (ever so much more as society becomes more equitable and technological); that it is somewhere between 40% and 80% heritable; and that it relates to not only school performance, but to jobs, income, crime, and illegitimacy; and that it cannot be ignored in any meaningful look at America's future. But the most explosive of *The Bell Curve's* arguments is that some of the difference in mean IQ scores between the white European population of the United States and the African-American population (one full standard deviation of 15 points) is probably attributable to genetic factors. No one in the field disputes this difference. The argument is over why the difference exists and, of course, whether and how it can be reduced. (Read the now-infamous Chapter 13 of *The Bell Curve* for yourself. It is a lot more tentative and nuanced than popular denunciations of the book may have led you to believe.)

Charles Murray is a graduate of Harvard with a Ph.D. in Political Science from MIT, and currently is a Bradley Fellow at the American Enterprise Institute in Washington, D.C. The late Richard J. Herrnstein received a Ph.D. in psychology from Harvard, where he taught from 1958 until his death last autumn. He held the Edgar Pierce Chair in Psychology (the oldest such chair in America).

Skeptic interviewed Charles Murray and found him to be as calm in explaining his positions as some of his critics have been apoplectic. If there was any trace of anger in Murray it was not for the underclass but for former colleagues who have, as he put it, "ran for the high hills," and for the Cognitive Elite, whom he feels have undermined the country that provided them the chance to rise to the top in the first place.

The next issue of *Skeptic* will be a Special Issue on intelligence, I.Q., race, and class, and will feature in-depth reviews of *The Bell Curve* by leaders in the field, moving past the rhetoric and getting to the heart of the science behind the claims. In the first of what promises to be a regular interview feature in *Skeptic*, Contributing Editor Frank Miele was more than prepared for the Murray interview, having been published himself on the subject in *Intelligence*, the leading journal in the field.

Here then is what "America's Most Dangerous Conservative" had to say to *Skeptic*.

Skeptic: In your book you present a summary of the current evidence on I.Q. on pages 22 and 23. Snyderman and Rothman's on *The I.Q. Controversy* in 1991 surveyed expert in the field, and just yesterday the *Wall Street Journal* contained a 25-point statement by experts in

intelligence. Based on those it seems your summary represents the consensus of experts in this field, even on the controversial issue of the involvement of genetics and the black-white difference in intelligence. As skeptics, we are skeptics of everything, including psychology. If we get this great a controversy over what looks like consensus, is psychology really a science in the same sense as physics?

Murray: I'm not comfortable with a blanket statement saying yes or no. But I think we can talk specifically about the basis for those statements in the Wall Street Journal and the book, which is certainly based on the kinds of methods that fall under the scientific method-- falsifiable hypotheses, the use of predictions, etc. A test is valid in so far as it predicts something of interest, or criteria measure, to use the jargon of the trade. More than most of the other social sciences, psychologists and psychometricians are prepared to have their results tested against classical statistical criterion of validity, reliability, and reproduceability.

Skeptic: One of the arguments would be that most of the analyses you and psychometricians have done is correlation, as opposed to causal analysis that we do in physics. Does that mitigate against the strength of the scientific conclusions?

Murray: We do not have accessible to us the same kind of control over our phenomena that physicists often have. However, having said that, there remains a black box where the cause hides that we cannot open up and look at. But one can eliminate a number of alternative hypotheses and transform correlational statements into ones which certainly have some causal persuasiveness. Example: the use of regression analysis, which is the all-purpose tool of the behavioral and social sciences these days. Let's take an example from *The Bell Curve*. The dependent variable is whether a person is below the official poverty line. And you introduce as independent variables a variety of candidate causes. Chief among these being socio-economic background, education, race, occupation, and then you throw I.Q. into that. If after looking at a variety of these other things which both theory and common sense say should have some bearing on whether a person ends up in poverty, but one ends up with a large, statistically independent role for I.Q., it seems to me to make a causal statement that I.Q. looks like its a cause of poverty, it is a reasonable thing to do.

By the way, when you actually read the book you will see that we typically word things in this cautious kind of way.

Skeptic: But could not someone say that in correlational analysis it is not really proper that you are not randomly assigning people to socio-economic status groups, or racial background, or whatever; are you and Herrnstein doing anything different than what is the common procedure used in regression analysis in, say, voting behavior, or anything of this sort?

Murray: The analyses we conduct in the book are garden-variety regression analyses. There is, however, also a body of work which does use randomly assigned experimental and control

groups that reflects on a lot of the issues we talk about in the book, which then begins to look more like experiments done in the hard sciences.

Skeptic: Can you be more specific?

Murray: Art Jensen's work with regard to reaction time. This is a matter of eliminating a lot of alternatives and trying to understand what's going on with I.Q. scores. This is where you have a situation with an apparatus with six buttons, and you have your finger on a button, and when a light goes on one of the other buttons you move to that button and push it. The reason why this kind of experiment is useful is (A) it gives us insight into something that has no known relationship to I.Q., in so far as you are simply asking someone to move his or her thumb to push a button. But it turns out that this reaction time is not only correlated with I.Q. scores, it is correlated with the general intelligence factor, g .

The main point is this. You have now made some headway into trying to understand what is going on with this thing called an I.Q. score--does it have a physiological basis, etc.

I'm not going to apologize for our use of regression analysis in the book. Everyone uses regression in the social sciences. If you want to say that social scientists are the astrologers of the 20th century and that they don't have the methods of science open to them and we thus can't take them seriously, fine, but unless you are prepared to make that argument the science in *The Bell Curve* using regression analysis is very much in the middle of the mainstream.

Skeptic: Stephen Jay Gould, in his *New Yorker* review, gives a four-point summary of your argument about intelligence: (1) it is a single number; (2) it is capable of ranking people in a linear order; (3) it is genetically based; (4) it is effectively immutable. Gould goes on to say that if any of these premises is false, the entire argument of *The Bell Curve* collapses, and he concludes that: "The central premise is false and most of the foundations are." Now, how do you square what Gould has said about this with your own summary of the book on pages 22-23. One of you has got to be wrong.

Murray: Stephen Jay Gould is recycling the same argument that appeared in *The Mismeasure of Man* in 1981. It was a very influential book in terms of the lay population and lots of people out there have their opinions formed about intelligence by *The Mismeasure of Man*, which included two types of information, one considerably more useful than the other. The first type was a history of intelligence measurements in the 19th and early 20th centuries, in which people made mistakes. (I seem to recall that physicists used to believe in something called aether.) There were phrenologists and others to whom we can now look back at and poke fun at. Fine, the problem is that in the same way that physicists are not criticized now for something other physicists did in 1910, so also has psychometrics made some strides since 1910 and 1900 and 1890.

The second thing is that Gould tried to make the same arguments for modern psychometrics, a lot of which were based on trying to demonstrate that the general mental factor g is a statistical artifact. The contrast I want to draw is between the attention that Gould's book got in the media and what happened in the scientific literature. Basically, there were a few perfunctory and rather derisive mentions of his treatment of factor analysis, and work went on without a break.

To put it more specifically, factor analysis is subject to a variety of kinds of problems because you can make different assumptions about how to create the factors. One can even, for example, demand of the algorithm that it produce factors which do not load on a single dominant factor. The problem with this is, as Dick Herrnstein use to say, you can make g hide but you cannot make it go away.

Skeptic: Sounds rather like Joe Louis. Let me go back to Gould's four points. Is there any one of those that you think is not a fair and accurate statement of what you said?

Murray: All four of them.

Skeptic: So you are not saying intelligence is a single number?

Murray: No. In *The Bell Curve*, we say of the I.Q. score, first, there have been a variety of ways to try to come up with independent mental factors. That has been a failure. On the other hand, there have been a variety of ways in which there are distinctions among different types of intelligence that are useful, such as the distinction between verbal, visual and spacial intelligence. And we talk about the different ways these different skills lead to success in occupations. And we talk, somewhat sympathetically, about the notion that there are, in Howard Gardner's words, multiple intelligences. We are a little dubious about applying the word "intelligence" to them, but we are very sympathetic that there are large domains of human talent that are not encompassed in the word "intelligence."

Skeptic: One of the complaints about the Snyderman and Rothman survey, the Wall Street Journal survey, and your own survey of the literature, is that you are working in that standard psychometric paradigm, but that is yesterday's news. The real forefront is Sternberg's approach to practical intelligence and Gardner's seven intelligences. You are sticking with something that is a very small portion of the discussion, so naturally you are going to get consensus.

Murray: Let me make a couple of other points about intelligence. One, the general mental factor, g , is very robust. You can take all kinds of different ways of creating your factors, and you will always get g . It doesn't matter whether rotate the matrix orthogonally, or obliquely, or whatever else, you always get the same thing. The second major point is that when you try with factor analysis to produce a situation where you do not have a general mental factor g , guess what? All the factors are correlated. Which goes back to Spearman's initial insight, which is why are the different measures of mental ability so consistently correlated with each other?

What's going on here? The answer is: there is an underlying general factor. That does not mean that it blocks out a whole territory of human talents or intelligence, and we say so in the book.

Gardner has made a variety of assertions about intelligence which, if true, are falsifiable. He is not only saying there are different talents, which Dick Herrnstein and I would agree with, he is also saying they are independent. With something like kinesthetic talent, which is quite physical, this is easy to say. It gets harder to say when he talks about interpersonal skills, versus verbal skills. If you are going to make that kind of statement, the next logical step is to come up with measures of these different talents and demonstrate that they are, in fact, independent.

Skeptic: So you are saying that some of these disagreements are empirically testable?

Murray: Yes, and Gardner has consistently been unwilling to subject his own work to that kind of empirical defense. He has stood apart from quantitative attempts to describe what he is doing and to enable other researchers to replicate it. Of all the different types of intelligence that Gardner wants to treat as co-equals, there is only one kind that will put you in the retarded class--namely the plain old fashion general mental ability. If you are kinesthetically challenged, teachers and guidance counselors do not get real worried about you. If you are kinesthetically challenged you may be the last person chosen for the baseball team, but you can go out and make a success of yourself in any number of ways. If you are intellectually challenged, however, you have a general disability that is pervasive over all kinds of ways.

Skeptic: I read in a biography of Muhammad Ali that when he took his draft tests he had an I.Q. below 80. Now, if I make a mistake writing my spell-checker will fix it for me. If you make a mistake Stephen Jay Gould may beat you up in the press. If Muhammad Ali made a mistake he was flat on his back. This man was making split-second decisions of the first magnitude.

Murray: If you are five standard deviations out on the edge of the curve in kinesthetic ability to the right hand side, then certain possibilities open up to you. But if you are low in kinesthetic ability, it doesn't make much difference to you in life. If you are a Muhammad Ali and you possess extraordinary physical talent, you have other avenues that will open up to you. But this example illustrates another important point, which is that Muhammad Ali is not a blithering idiot. Yet there is nothing in his public utterances, his charm, his presence, his charisma, and all the rest of that, that is inconsistent with a measured I.Q. in the high 70s.

Skeptic: One of the things that Gould takes you to task for is that you do not report the scatter on your regression lines, and that the r squared values do not appear in the body of the book, but in the appendix. Can you tell us what those terms mean and why he thinks they are so important? And what is the usual practice here--have you and Herrnstein done something different than what would be done in a book on, say, political voting behavior.

Murray: Correlation is denoted by r , and in ordinary regression analysis r -square--the square of

the correlation--reflects the proportion of the variation in the data that is explained by the set of independent variables that are in the regression analysis.

Two points. First, the book is exemplary in opening up the section in which we present these regression analyses by explicitly pointing out in the body of the book that the r-square is small. That is in the very first pages of the whole presentation. It is also exemplary in a book aimed at a general audience that we specifically include an appendix with a print-out of every single analysis presented in a graph in the body of the book. This is something you will not find in most books aimed at a general audience, including *The Mismeasure of Man*. Dick and I presented far more statistical information than is ordinarily presented in a book such as this.

Second, I don't know how much Gould knows about regression analysis. When you are using logistic regression analysis--in which the dependent variable is a nominal variable, in our case a dichotomous yes-no: Is the person below the poverty line, yes or no? Whenever you have a dichotomous dependent variable r-square becomes very difficult to interpret. Particularly with rare phenomena. For example, if you have a situation, as in the case of poverty where 87% of the population is not impoverished, you only permit two values in your dependent variable, you are going to get a lot of noise in the data, which means r-square becomes very difficult to interpret for technical reasons.

Skeptic: One of the criticisms, then, would be that the I.Q. isn't that effective. There is a lot of noise, so why are you saying it is so important?

Murray: Let's use poverty as an example. For poverty the r-square is .10. So we can explain only 10% of the poverty, so obviously I.Q. cannot be very important, can it? Well, if you then go back and take a look at the chapter on poverty, and then you take the probability that a person is going to be in poverty if he has low I.Q., you find out that among whites, the probability of being in poverty if you are in the bottom 5% of I.Q. is 30%. The probability of being in poverty if you are in the top 5% of I.Q. is 2%. Furthermore, when you take into account education and socio-economic status, the magnitude of the difference in probability of being in poverty is not much attenuated. How can this be if you can only explain 10% of the variance? It goes back to the ways in which logistic regression equations in which r-squared is not nearly as interesting as the magnitude of the effect that I.Q. has on the probability of being in poverty. And this applies across the range of the analyses we report.

Skeptic: Let's try to cut this another way. If you get so much predictive value from using intelligence just in I.Q. score, how much do you add by getting these other measures of socio-economic status or whatever. I.e., what's the sequence? What's the biggest predictor, and how much do you add by cranking in the others?

Murray: It depends on the phenomenon you are looking at. Once you introduce I.Q. the importance of socio-economic background is much attenuated. Often times the role of socio-

economic background disappears altogether when I.Q. is in the equation. Conversely, introducing socio-economic background into the equation often times attenuates the role of I.Q. by only a very small amount.

Skeptic: Let's talk about cognitive stratification you discuss in Part I of your book. Secretary of Labor Robert Reich gave a speech on the "Anxious Class," where he says: "Contrary to some theorists our destinies do not reside in our genes. Study after study show that skills can be learned. Every year of education or job training beyond high school, whenever it occurs in life, increases average future earnings by 6% to 12%. GNP is not simply a matter of DNA. Most Americans are on a downward slide not because of genetic deficiencies but because they lack the learnable skills to prosper in an economy convulsant with change."

But the picture Reich paints is actually very similar to your own: a high-end cognitive class that is doing great, a bunch of worried people in the middle saying "where's that job my father had," and an underclass at the bottom that is falling downward in freefall.

Murray: Yes, and we make a reference to Reich's work and we point out that he is more optimistic about the role of education than we are, but there is great similarities.

Skeptic: And on this subject of what society can do to bring up this underclass, you have been something of a godfather of the get-rid-of-welfare movement before you got into talking about I.Q. Conservatives like Newt Gingrich, Buchannon, Kemp, and Bennett, have also talked about getting welfare, but they have rejected The Bell Curve's analysis of I.Q. Does one of these follow from the other?

Murray: You know, in all 845 pages of The Bell Curve, we talk about getting rid of welfare in one sentence. We have a single sentence in Chapter 22 in which we talk about the ways government should get out of the business of encouraging any group of women to have babies, whether they be smart or dumb. And we generally urge that policies that subsidize birth be ended. It is one sentence. A single sentence. And one does not follow from the other.

Skeptic: Even if there was no inheritability to intelligence, no racial difference in any of these things, you would still be in favor of getting rid of welfare.

Murray: Yes, absolutely.

Skeptic: One question we might ask about your book is: why this book now, and why the controversy that surrounds it? Is this a case of a bad economy, an anxious public, and so we are blaming the victims and scapegoating those least capable of defending themselves?

Murray: Why is it published now? A better question is: why was it not published in the last 30

years? There has been a collective intellectual cowardice about understanding the role of intelligence in understanding social problems. Let's take one example. Child neglect is one of the most rapidly growing social problems we have. How many thousands of people make their living either writing about problems of child neglect and abuse, and so are advocating for new laws, etc.? Well, as every parent knows without reading anything about I.Q., there is a plausible relationship between intelligence and child abuse. Which is to say, any parent knows if a child has had a fever for 24 hours and hasn't been taking in liquids, you make a calculation that this has gone on too long and we've got to get this kid to a doctor, etc. Any parent knows that child-proofing a home takes foresight and thoughtfulness--it takes a certain amount of I.Q. With that plausible relationship in mind, the failure of social science and politicians alike to confront the possibility that low I.Q. is an important risk factor in child neglect is scandalous. Every single bit of evidence that does bare on this says that I.Q. is a great big factor in child neglect.

Skeptic: Couldn't someone take your arguments and say "we need more redistribution programs, not less, because these people cannot help themselves"? Haven't you knocked the bottom out from the conservative pull-yourself-up-by-your-own-bootstraps ideology?

Murray: You put your finger on something that Dick Herrnstein and I also thought about from the time we began working on the book. It is something that my friends on the right were concerned about. They said, "look, this type of material lends itself to all sorts of reasons to have a more interventionist state, and more welfare, and more redistribution, not less." We knew that. That is one of the major reasons for saying that it doesn't really hang together that this book was designed to foster a political agenda. It can be used by both sides.

The other point is that you have just described why Dick and I open up Chapter 22 with seven or eight pages of political philosophy. We say to the reader very explicitly "what we have just described for you could play out in any number of ways politically. Therefore what we are going to do is describe to you our own political predispositions, which have nothing to do with I.Q., why we hold them, and having told you those predispositions, then we will tell you our strategic view of what ought to be done."

Frank, I challenge readers of Skeptic magazine to go to any other book with policy recommendations by liberals which contain such an explicit, open, candid description of the author's political bias.

Skeptic: I'd like to go further on that limb. One might argue that The Bell Curve challenges the whole tradition that many people identify as American--namely equality. Do you find that your conclusions better fit a pagan vision of the universe that sees humanity as continuous with the rest of existence rather than as created in the image of God, and the Goddess fortuna working her wiles through DNA?

Murray: Our vision is Jeffersonian. Up until 30 years ago, in the early 1960s, Dick and I would

have been describing a vision of America that everyone would have said, "of course." It is a vision in which we say that people bring different things to the table. The important thing is that everyone be given the opportunity to go as far as their own temperment, energy, characteristics, and intelligence will take them. The crucial factor in coming up with a harmonious society is not equal outcomes, it is abundance of opportunity. We are talking straight out of a tradition that until 30 years ago had virtually no intellectual challenge. It is only in the last 30 years that people have lost sight of those fundamental tenets of the American idea. And Thomas Jefferson would read *The Bell Curve* and, I like to think, nodding his head in approval. He believed there was a natural aristocracy that would make the republican experiment work. Personally I don't like the term "natural aristocracy" because I don't think the cognitive elite that we have now is all that great.

Skeptic: Along these political lines, with your previous work in many circles you have been the intellectual darling of the conservative anti-welfare crowd. But now that your book has stirred things up, do you feel that your former allies and friends are now running away from you, and how do you feel about that behavior?

Murray: I assumed that when the book came out that a lot of people that used to think I was really neat would now say, "Charles Who?"

Skeptic: Has that happened?

Murray: I'm surprised at the extent that it has not. I thought that my political life would end. There seems to be a reflexive, almost deep inner panic, in an awful lot of people to be on the right side of *The Bell Curve* issue. And the right side is being perceived publically that you are shocked that these authors would suggest that intelligence has an important role in social problems; shock to think that anyone would still suggest there are differences among the races in intelligence. I've seen people, who I thought were both smart and honest, lie when it comes to the book.

Skeptic: Can you still be friends with these people?

Murray: No.

Skeptic: As I've said, at Skeptic we are skeptical of everything. Given your experience do you think that the American political process can deal with the fact that *Homo sapiens* is a biological species, subject to the same laws of evolution and genetics as other animals? Can a democracy deal with the information in *The Bell Curve*?

Murray: Actually, I'm optimistic on this score. This book has created in the news media a type of hysteria, where it has been denounced not just as wrong, but as evil and misguided. But there are now over 400,000 copies of the book in print, and as my wife points out, correctly I think,

people do not plunk down \$30.00 to buy a pseudoscience, racist track. They just don't do that. They are reading the book and talking about it.

I think what has happened to American intellectual life is that we have undergone a temporary aberation--30 years, short as these things go--whereby we have tried to deny all sorts of realities about human biological characteristics. The best thing about this book is that these issues have been taken away from the ??chattering?? classes. They are now out there in public discourse in a way that is going to provide cover for a lot of good scholars who want to talk more openly about these issues but have been reluctant to. I'm Panglossian in my optimism.

Skeptic: What happened the last 30 years?

Murray: What happened in the 1960s, and now I'm citing from *Losing Ground*, was a fundamental change in the view of how society works and what individual responsibility is, and this includes everything from education to law enforcement to the use of lawsuits, etc. It was a very widespread, but I think temporary, change that we are just now beginning to recover from and I think one of the lessons of this most recent election has nothing to do with people wanting a middle-class tax cut. It has to do with people wanting to return to a much more original view of how America is suppose to work.

Skeptic: Let me follow up on that. Hillary Rodham Clinton was in charge of the President's attempt to get a welfare reform, but it didn't go through. No one would say that was because she didn't have sufficient intelligence, energy, knowledge, whatever. When I see your idealistic vision of what you would like to have in America it doesn't seem realistic. You are being Panglossian.

Murray: I was Panglossian about these issues getting into the public dialogue. Now let me shift to being the pessimistic curmudgeon, of which I'm much more comfortable being! And that has to do with looking ahead to the long term. Hillary Rodham Clinton is the personification of what worried Dick Herrnstein and I about the cognitive elite. I'm sure she has a high I.Q. score. She, and for that matter her husband Bill, are both examples of people who by the age of 18 had been siphoned off into elite colleges and have spent the rest of their lives interacting with other people very much like them--the cognitive elite. And what happened in the Helms bill [Frank: explain what this is] is a classic example of what happens when the cognitive elite has been talking to itself too long, and thinks it knows what's best for everyone. In this case, fortunately, they were derailed.

In the longer term what scares me is that the cognitive elite is, indeed, a powerful enough force to continue to rig the rules of the game. We are in favor of deregulation and decentralization, but I'm afraid the cognitive elite are going to make these things very difficult to carry out.

Skeptic: This bewilders me. You seem to say two different and possibly contradictory things.

One, The Bell Curve finds the tremendous advantages that high I.Q. people have and which can be interpreted in a very elitist manner. Then, the libertarian Charles Murray emerges and says, well, the average Joe can run his life better than anyone else. How do you have it both ways?

Murray: Because running one's life is a matter of making all sorts of choices, and the satisfactions one achieves from running one's own life is inextricably linked with having been the person to make those choices. Someone with an income of \$30,000 a year who made it himself I submit to you is a happier man than someone who got that same \$30,000 unearned, whether it comes from welfare or trust funds. People running their own lives, taking responsibility for their own actions, that's the way human beings are wired to live satisfying lives.

Skeptic: So you really are a volunteerist on this. You are not a determinist. You are not saying everything is in the genes. You think free will is a meaningful concept.

Murray: Yes, and so did Dick Herrnstein, who was a student of B.F. Skinner.

Skeptic: Who didn't!

Murray: Yes, and Dick evolved a lot from his days as a behaviorist. One of the most difficult things to get across to people is that one may talk about genes playing an important role without being forced into anything resembling a determinist view of the world. But it is a contradiction only in this sense. The people who run their own lives are not necessarily going to make decisions that maximize anything in terms of some external source of comparison. In the Hillary Rodham Clinton world they might look at the things you have done or the choice you have made, and say, "no, no, if you would have done this other thing you would have had more money, you would have had more security, etc." I'm saying that a lot of the basis for deciding whether the decisions one makes in running one's life are right or wrong has nothing to do with these types of external criteria.

You've asked very difficult questions that are hard to answer in a few sentences . . . but they are good questions.

Skeptic: Well, that's what we tend to do at Skeptic. Is there anything you would like to add in conclusion?

Murray: I've enjoyed the interview. The only thing I would add is my own unhappiness at the way that Dick Herrnstein's name has been eclipsed. As I've said to Susan Herrnstein, she would not be pleased to have Dick being called all the names I have been called over this issue.

Skeptic: Yes, but he seemed to give more than he got in his lifetime.

Murray: I have confidence that in five years from now, and thereafter, this book will be seen as a major accomplishment. I also want it to be known that this collaboration between a political scientist and a psychologist is something I'm immensely proud of. Working with Dick was this wonderful experience of dealing with a man who loved and respected data, and respected the scholarly ideal of getting it right, absolutely right. And we think we did.

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NPR Interview with Charles Murray

NPR, 10-28-1994.

ROBERT SIEGEL, Host: In a nutshell, here is the thesis of the book *The Bell Curve - Intelligence and Class Structure in American Life* - IQ is important in America, more so than ever before. IQ is a better predictor than socio-economic status or ethnic background of how well an individual will fare in school and at work. We are an increasingly segregated society, but we're not divided by a color line or by tax brackets. We are distributed along the social scientists' bell curve. The mass of Americans huddle at the mountain in the middle. People with high IQs form a cognitive elite at the right, and those with low IQs form the real underclass at the left.

Authors Charles Murray and the late Richard Herrnstein go further - IQ, they say, is dictated more by heredity than by environment. The gap of about 15 points between the mean IQs of whites and blacks persists even among groups of equal socio-economic status. Their book has received some respectful reviews, but it has also generated an outcry in magazines and editorial columns and some predictions that other social scientists will debunk the book in due course. Charles Murray has been accused of being a racist and a tendentious scholar who ignores contradictory data. When he came here today, I asked if any of the criticism has led him to regret any of what he wrote in the 800 pages of *The Bell Curve*.

CHARLES MURRAY, Author: In one way, you're talking to a sadder but wiser man. That's- There's no doubt about that. I have been appalled by the last couple of weeks, and a friend of mine said to my wife when she made this point, he said, 'Well, what is it? You sound like somebody who got into World War II and is surprised that they're firing real bullets.' So I guess I shouldn't be surprised in some ways, but I am. I expected to get hate mail. All right? And I expected to get hate phone calls, which I haven't gotten. Please don't take this as a request for them. But I didn't expect to see journalists who I respected and have oftentimes known personally for many years to act as irresponsibly as I think a lot of them have acted.

SIEGEL: But let me stand up for your wife here, who told you you should have expected as much, which is that arguments about genetic determination of intelligence or the lack of intelligence have been put to some of the most obscene uses of any science or pseudo-science in our times. Surely, you must have known in approaching the race issue and the disparities of IQ that you were walking into an area that people are, can become deeply offended and-

Mr. MURRAY: Yeah, yeah, we did know that. And I think if you read the chapter, as you have, that we sort of clearly say we are aware of what we're about to do. What's going on behind the

scenes in this country and the dialogue about race is very dangerous, and what Dick and I said is, you know, the facts are not as scary as a lot of the misinformation out there. It is time to lay a lot of this stuff out on the table, and we in a period of time can get over it. We are not through that period of time yet.

SIEGEL: But let me run past you something that I gleaned from the dialogues on race that I've been party to that I think counts for some of my reluctance to accept a rigid hereditary or inheritable theory of intelligence, and that is that, when you show that blacks and whites of equal socio-economic standing, or, as socio-economic status increases, that a gap in IQ and other social measurements persists - to say that those two groups of people are the same in a way clashes with what I've learned as an adult, which is that the same experiences people of the same income level, the same education level, black and white, can find situations of employment or education remarkably different. They can find the same physical, material, temporal experience, on the one hand, a breeze and something you're born to thrive at, and, on the other hand, something quite threatening and undermining. And blacks and whites very often see things because of their social and economic histories quite differently. I wonder if we shouldn't put a big asterisk onto 'same socio-economic status.'

Mr. MURRAY: Well, just to clarify something. When it comes to the role of genes in the black-white test score difference, Dick Herrnstein and I are really agnostic about what the mix might be there, and, in fact, we aren't going to go very far out on a limb saying there's a mix at all. We don't really know. But your larger point is well-taken, and, in fact, I would endorse it in this regard - let's start thinking of the environment as being a whole lot bigger and more complex than we have in the past. And let's say that it could very well be an environment and that, writ large, that accounts for some of these differences.

SIEGEL: It's not just things and money, but what I think that person over there thinks of me, what I think, in what way I think they esteem me or don't esteem me-

Mr. MURRAY: But, but, but that in itself is, I think, consistent with another point that we try to make, that we've taken a hammering on, which is that, when people think of the environment and the environment causing differences, there is this impulse to think, 'Oh, well, we know what to do about that.' And we have all these little things we'll trot out that will provide for children to make up for their environmental deficits. If there is a contribution in this book with regard to the racial difference, I hope it is this - that we get a lot more realistic about how hard it is to manipulate the environment because I think until we do that there is going to be a lot of self-congratulatory talk every time we raise the funds spent on remedial education and whatever and not a hard enough look at what we're actually accomplishing.

SIEGEL: But if the- If one were to read the book and say and deal with your data more than with your policy recommendations and say, 'Look, OK, IQ turns out to be a bit stubborn.' Many, some social scientists who have commented in the reviews about your book say actually

there are other studies to show that IQ is more elastic than you would say, but it appears to be stubborn. You would say, it levels out about age six or eight, and it's a very good predictor of what will happen to people in later life. Well, at around the third grade, let's test for IQ, track like crazy, stop with efforts to create a more diverse elite and do vocational education starting at age nine for those people who are headed for the left tail of the bell curve. Is that a sensitive reading of your book?

Mr. MURRAY: No, no, it's not. We think that what, in terms of education, what people ought to do is to be able to fulfill their talents as far as they want to go, and actually we think parents are a pretty good way, the family's a pretty good way, to have a whole bunch of people trying hard to have their kids go as far as they can go. So we do not want an 11-plus kind of system like they had in Britain. We want, if anything, to decentralize control over education even more than it is now. There is in our book very little- No, let me phrase that more positively. I would say there is in our book a very strong affirmation of a traditional American ideal, which is that you treat people as individuals, you try to let everybody fulfill their potential as individuals. What Dick and I are saying is, as we go about that process, let's also be aware of the larger social phenomena that this drives. Let's be aware of the down sides that it has, which have nothing with race, because, unless we are aware of those, we are in danger not just from an underclass or even as much from an underclass as we are from our cognitive elite, which, in our view, is becoming more and more a potential threat to free institutions.

SIEGEL: If I had told you somewhere along the lines of writing the book or researching the book that this, that the publication of the book would prove terribly dispiriting to minority kids, let's say, to black school children who would catch the drift, the distant drift of this thesis that's wending its way through every news weekly and op-ed page and letters to the editor, would you think twice about that if you felt you were putting into the air a case that might make a large number of kids feel debilitated and feel like everyone think' s they're stupid. Would you say, `Well, maybe on second thought I shouldn't write this'?

Mr. MURRAY: Dick and I talked a lot about that, and I don't want to speak for him because I don't remember exactly where he came out. I know for my own part, were this the early 1960s before the advent of treatment by groups, before the advent of a lot of other problems that we've had, when there was real progress in race relations in this country, I think that I would have had other thoughts. In 1994, it is not the case that black youngsters are suddenly with publication of this book getting the sense that, `Gee, whites think that we have lower IQs than they do.' This is not only in the air and has been in the air continuously; it has been, we think, all the more debilitating because it's been this kind of miasma that permeates everything, never talked about, never exposed to the light of day. Everybody knows it's there.

SIEGEL: But let me call you on that for a moment because I think to look back on race relations in America and to say that it was never talked about that whites thought blacks were intellectually inferior is to miss decades of racist discourse in the United States which have

bombarded black people in America, and this isn't novel-

Mr. MURRAY: I was referring to right now.

SIEGEL: Yes, I know you were referring to right now, but to the ears of somebody who's been raised on the black experience in America, this is compounding something that has been absolutely the argument behind segregation. Mr. MURRAY: No, the- Well, whatever. We're going to disagree on this, but I'll tell you why I disagree. Dick Herrnstein and I both feel very strongly that the facts on this are not something that needs to make a black youngster feel bad about himself because we don't think that's the way parents and youngsters deal with their lives. When I am thinking about what I am going to be as a child, I am thinking about what I am and what I can do, and what I want most of all is a society that tells me, 'Youngster, you can go as far as your energy and abilities will take you in whatever direction you have energy and abilities.' That's the message we want to send, what we think this country has been doing, and, again, I would ask for you to have me back in three or four years, and let's see who is right on this issue.

SIEGEL: Charles Murray, author of *The Bell Curve*.

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An Interview with Carl J. Bajema

An Interview With Carl J. Bajema

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Carl J. Bajema is Professor of Biology at Grand Valley State College in Allendale, Michigan. He has done research and authored numerous articles and books on eugenics and related areas over the past twenty years. The following interview was conducted via telephone on October 2, 1983.

VANCOURT: Do you think the Hyde Amendment [which prohibited DHEW from using Medicaid funds for abortions for poor women] has had an appreciable dysgenic influence?

BAJEMA: There are certainly a lot of unwanted pregnancies, and the Hyde Amendment makes it very difficult for women in the poverty category to obtain abortions. So my immediate response to that question would be "yes". In my particular state, in Michigan, the state still pays for these abortions. But many states have refused to step in and pick up the costs. This had got to have an adverse effect in a variety of ways, including a dysgenic effect.

VANCOURT: You have explicitly stated that tiny positive correlation between intelligence and number of offspring reported in your studies and in several other studies could not be generalized to the entire United States population. You warned that they applied only to those samples, and for that period of time. Now Vining, using a representative sample of the U.S. population, has found significant negative correlations, Do you think people generally heeded your warning?

BAJEMA: A number of people in the academic community said "Oh, well--we've got three studies which show a positive correlation, so fertility and intelligence is not a concern anymore." There doesn't seem to have been a very strong interest in continually ascertaining what is going on in terms of differential fertility with respect to mental ability.

VANCOURT: The American Eugenics Society changed its name to The Society for the Study of Social Biology in 1972. Looking back, do you feel this was a wise decision?

BAJEMA: No, and I opposed the change at the time. I was Secretary then, and I thought both the American Eugenics Society and the Eugenics Society of Great Britain had succeeded, at least in the academic and scholarly world, in demonstrating that the word eugenics isn't something to be equated with Nazi genocide. I appreciated some of the concerns about the word. But I wasn't at all impressed with the name they chose -- social biology. It just doesn't convey any information. Then, with the development of the whole field of sociobiology, the confusion became even greater.

I probably would have kept the name of the society the American Eugenics Society, but changed the name of the journal to something that would be less offensive to some people who only thought in terms of Nazi-type eugenics. In fact, one of the reasons I resigned was over that. And some people didn't want to be thinking along eugenics lines at all, which disturbed me. Social Biology still publishes excellent articles that are of eugenic interest, but I wanted to belong to an organization where eugenics was the main focus.

In the long run, though, I think we ought to consider some kind of a name that would help us. For example, Planned Parenthood used to be called The Birth Control League of America, which had a somewhat negative connotation. They changed their name to a more positive term, The Planned Parenthood Federation of America, which I think really helped them politically. Now, maybe we can do the name thing with respect to eugenics. As much as I like the term and feel it's been misused, words aren't sacred. It's what we're trying to accomplish that's important. We could still keep the name eugenics as the parent name of the organization, but the journal and everything else could have a somewhat different name.

I'd like to hear from readers about possible words we could use in its place. One word I've suggested -- and no one seems to be particularly excited about it -- is "futuregenics". We're concerned about the future, and about how the present affects the future. At any rate, a new word could separate the idea from some of the irrational hostility against it, particularly amongst people in the social sciences who have real knee-jerk reactions to eugenics. The advantage of a new word is simply that at least some people would be willing to give it new consideration.

VANCOURT: It has been reported that schizophrenics have increased their fertility substantially in recent years because major tranquilizers make institutionalization unnecessary. Given that mental illness has a proven strong genetic component, how much do you think this will increase the incidence of schizophrenia in the future?

BAJEMA: I don't know by how much, but it certainly should increase the incidence in the future. We may well develop better drug therapy at the same time, which would ease the problem. But we can expect the incidence to increase.

VANCOURT: How do you think we could ease the burden of motherhood to make it more attractive to bright women who also want to pursue careers?

BAJEMA: There are several ways. One is free daycare centers for children. The other is scholarships and fellowships with allowances for dependents. That would apply to men as well as women. Having dependency allowances that are adequate, and free, high-quality daycare centers, and possibly even some kind of tax credit would all be appropriate ways to ease the burden of parenthood to make it more attractive to both men and women who are well-educated, and who want to make a contribution outside the home.

VANCOURT: It was announced on the news recently that an embryo had been successfully implanted into the uterus of an infertile woman. Another woman who was fertile donated an egg-- she was artificially inseminated with the husband's sperm, and the embryo was removed shortly after conception and placed in the infertile wife's uterus, where apparently it has been growing normally. Do you have any thoughts to express on eugenic implications of this new procedure?

BAJEMA: There are certainly eugenic implications of embryo transfer, particularly with respect to how the women are selected who provide the eggs. The very same issue exists with artificial insemination, that is, the quality of the donor. But right now, embryo transfer is quite expensive, so I don't expect very many people to utilize it.

VANCOURT: Several people (notably Cattell, Graham and Fisher) have written about the origin of dysgenic fertility. They don't all agree as to whether it came along with civilization, or whether it existed from the time human beings first discovered the causal connection between sexual intercourse and conception. Would you care to speculate on this question?

BAJEMA: Well, everybody likes to speculate, so I might as well speculate, too. I think a good case could be made for its being associated with what demographers call the "demographic transition". As we shifted from high mortality and high fertility to low mortality and low fertility, that may very well be when we got a sizeable amount of dysgenic fertility.

VANCOURT: Do you have any suggestions for the Eugenics Special Interest Group, such as how to increase our membership, participation and funding, or for improving the Bulletin?

BAJEMA: I would suggest soliciting three or four names from each new member who joins, names and addresses of people who'd be likely to be interested also. Another possibility is to identify books, journals and articles in which an individual makes a positive statement about eugenics, and check over the mailing list to see if that person is a member, and if not, send him or her a sample Bulletin. As for improving the Bulletin, I'd suggest adding very brief book reviews of new books, notices of important papers and of conferences to come. It should be kind of a little clearing house. That's an important function, because eugenics cuts across so many disciplines.

And then you might put announcements in the Bulletin every once in a while to the effect that two or three of us will be in a certain city on a certain date for a convention, say, and if there's anybody else who'd like to join us for dinner, fine. There are really all kinds of things we can do to share information and get more involved.

VANCOURT: What research questions do you think are important to investigate in the future?

BAJEMA: First would be a longitudinal study of high school students--a random sample of schools in the U.S. could be chosen, and then studies done at periodic intervals to coincide with

their reunions. All kinds of biographical data could be gathered on their educational and occupational attainment, age of birth of children, fertility and so on. One of the only problems would be tracking down those who didn't graduate so their absence wouldn't constitute a source of bias. This kind of study would be very helpful in terms of estimating the eugenic or dysgenic effects of a wide variety of social practices. Right now, I'm linking into the 50th reunion of the Third Harvard Growth Study participants. When you work with the reunion committees, you'd be amazed at what you can get, and fairly reasonably in terms of cost.

Another thing I think ought to be done--there needs to be a very careful longitudinal study of children produced by artificial insemination, of their mental and physical growth, their occupational and educational achievement, their fertility and so on. I think it will clearly demonstrate the eugenic value of artificial insemination in a way that just anecdotal evidence can't.

VANCOURT: Several ESIG members have written to me saying essentially the same thing: "I believe eugenics is a vitally important issue, and nobody seems to be doing anything about it. What can I do to further this cause?" Do you have any advice to impart?

BAJEMA: I certainly do. I think you have to put your money and your time where your mouth is--that's the way I'd put it. And I mean both money and time. There are political controversies we need to get involved in, because in some cases, the side eugenics is on is losing. I'll give you some examples: First, it's very important for anyone who supports eugenics to also support Planned Parenthood and various abortion rights groups. Second, it is crucial to support sex education and contraceptive education in the schools. Third, we need to counter the fundamentalists' attack on the teaching of evolution. And fourth, there's the controversy going on with respect to the teaching of values which concerns us. What is called "values clarification" helps students learn about different ways of viewing an act in terms of both personal consequences and social consequences. An extreme right wing faction wants to force this out of the schools.

Eugenics is not independent of these controversies, because depending on how some of them go, it could be extremely difficult to discuss eugenics in the schools, and to develop a national policy with respect to eugenics. Then, there are the traditional things people can do in terms of financial contributions, in terms of helping the Eugenics SIG. There may be somebody out there who has considerable funds who could set up a fellowship program--that's a very important way of making sure that certain kinds of research get done. Finally, it's important to become a critical thinker on this issue, and to do so publicly by writing articles, letters-to-the-editor and so on. In this area, I believe every little bit helps.

VANCOURT: Is there anything else you'd like to add?

BAJEMA: Well ..one thing you might want to stress in the journal is the letters-to-the-editor

column. I noticed a letter from the Weyls in the last issue. But you may want to encourage people to write in more. They may have a question they'd like to ask someone who was interviewed. For instance, I'd be quite willing to answer questions. Another thing is--do you have a word-processing computer?

VANCOURT: No, I don't.

BAJEMA: Now, that's something you really need. I think someone out there really ought to donate a word processor to the editor of the Eugenics SIG.

VANCOURT: I couldn't agree with you more! Well, this has been an interesting and informative interview. Thank you very much.

BAJEMA: You're certainly welcome

Interview with Robert K. Graham

Originally published in The Eugenics Bulletin, Winter 1983

Robert K. Graham was co-founder and director of the Repository for Germinal Choice, a California-based sperm bank which stores and distributes the sperm of Nobel Prize winners and other men of exceptional ability. He invented the plastic spectacle lens, and was the author of The Future of Man.

The following exclusive interview was conducted on January 20, 1983 in Austin, Texas. Many things have changed and much progress has been made in the intervening years, but Dr. Graham's rationale remains timeless.

VANCOURT: Approximately how many applications have you received so far?

GRAHAM: Over 1000.

VANCOURT: And how many women have actually begun the program?

GRAHAM: Well, we've had two births and we have 15 pregnancies, as of this speaking. There are also 45 currently undergoing insemination--those are all in the USA. Although we've had many applications from outside the country, they present various importation problems that have to be worked out first.

VANCOURT: Are there legal questions this project has raised which never existed before?

GRAHAM: Yes, quite a few. In fact, there are major legal expenses involved in setting this up on the present scale, to avoid lawsuits if there's a faulty child born. Because the chances of a faulty child are just inherent in the situation--sooner or later, there will be some youngster who is not well-endowed, perhaps even a child with Down's syndrome.

VAN COURT: What originally inspired you to create the Repository for Germinal Choice?

GRAHAM: Shall I go way back to the beginning?

VAN COURT: Yes, please.

GRAHAM: Early in my life it dawned on me that bright people--at least the desirable citizens, the ones who carry on the real planning and doing in the community--weren't reproducing themselves. This became apparent to me in the little town in northern Michigan where I grew up. The doctor had only one child, the banker had one child, the leading lumber mill operator

had three children, none of whom married. The richest and most famous man in town was childless. So was the only man listed in Who's Who. My dad was a dentist. These were among his friends, and the people I knew best and regarded most highly. It troubled me they weren't even reproducing themselves.

Then after college, for ten years I was a salesman calling on doctors. There again, I found that most of them had only one or two children. I accumulated information and observations, and did a lot of reading for ten years. Finally I wrote a book. I asked a friend, Raymond Cattell, if he would review the manuscript, which he did. He was also a friend of Hermann J. Muller, who was as great a geneticist as there was in that day, perhaps still as great as any. Cattell told Muller about the manuscript because in it I had suggested several ways of encouraging bright people to have bigger families, and one of them was similar to Muller's plan. But Muller had conceived it first, and had thought it through much more thoroughly than I. Muller was willing to go over the manuscript and helped me immensely. In fact, he came to Pasadena where I lived, and we spent most of three days going over it.

Ever since then, until Muller's death, he and I worked together, first on the manuscript, and then on the establishment of the Repository for Germinal Choice. That was Muller's name, incidentally. All of his friends, including me, threw up their hands at the thought of such an awkward, academic name. But it's a precise name. Nobody has come up with a better one.

At any rate, Muller and I decided to jointly establish a Repository. I was to finance it, and he was to guide it. We drew up and signed an agreement to that effect. I set up a laboratory. But we never did anything about it as long as Muller lived. He always wanted to think through some of the problems. He dreaded any publicity, and it would indeed have been adverse at that time. He was a sensitive man. The equipment sat idle the rest of Muller's life, and for years thereafter, because I was busy manufacturing lenses. But when I sold my lens company to 3M, I began contacting Nobelists. Muller had named several Nobelists as desirable donors. I didn't intend to limit it to Nobelists, but I did want to start with them. Now we've extended the donors to Fields medalists. For some reason, Nobel specifically excluded mathematicians from the scientists who could win a Nobel Prize. Fields medalists in mathematics are younger, and at least the equivalent of Nobelists in the hard sciences, especially since there's only one award every four years.

VANCOURT: Is William Shockley the only donor who has publicly acknowledged taking part?

GRAHAM: Yes. And I would like to explain why I'm eternally indebted to him. When I started recruiting donors for the Repository, I went to a number of Nobelists in California--there were about 21 in that state. One who agreed to be a donor was Shockley. Two others also agreed, and were making repeat donations. I called a press conference [February 29, 1980] and announced that the Repository was set up and looking for recipients. Immediately after the conference, one of the reporters called all the Nobelists in California to ask if they were donors. They all denied

it. Even the donors denied having anything to do with it. And I understand why they had to. But Shockley said "Yes, I'm a donor, and the others should be too. They should be ashamed if they're not." He was the one person who saved me from looking like the country's champion liar. So when he ran for the U.S. Senate, I plugged for Shockley.

VANCOURT: I read a little something about that, but I don't think it got much national coverage.

GRAHAM: He didn't expect to win. But he had a point to make, that dysgenics is a serious problem that the le. hi stature should be aware of. And I think he did accomplish that, to some extent.

VANCOURT: How many different donors do you have now?

GRAHAM: We now have about 19, most of whom are repeat donors.

VANCOURT: Do you make any attempt to assess the personality and character traits of the donors?

GRAHAM: When it comes to donors, we can be as rigorous as you could wish. There are hundreds of top-notch, world-class scientists. We can go to the ones we want. Most of them decline. But among those who agree to donate, we use only those with great creativity, which correlates closely with high IQ in the sciences, and those who have no serious hereditary taint. Myopia, hemorrhoids--we ignore a few minor things like that.

We include details about the personality and character of the donors on the information sheet. The recipients naturally want to know height, weight, coloring, ancestry and so forth. If there's anything else worthy of note, we include that too--like "He is a highly skilled amateur musician", or "He was an exceptional athlete when in college". We list a comprehensive description. In the donor's questionnaire, he has to answer hundreds of questions in order to eliminate the possibility of deleterious hereditary traits.

VANCOURT: Do you ask about all the members of their family, like if there's any schizophrenia or other mental illness?

GRARAM: If there's any schizophrenia in the family history at all, they're out. And there are many other things, like Tay Sachs, we try to eliminate.

VANCOURT: I've read that Muller's widow wants to dissociate his name from this project. It's abundantly clear from his writings that Muller was an ardent proponent of eugenics, and that he specifically supported artificial insemination using the sperm of eminent men. How do you

account for Mrs. Muller's attitude?

GRAHAM: I named it the Hermann J. Muller Repository for Germinal Choice. It was his concept, and it was unthinkable not to give him credit. But Thea, his wife, resented my using his name. Furthermore, she didn't think that, in limiting it to Nobelists, I was doing it exactly the way Joe had said. Now, Joe had contemplated a lot of different ways in our years of discussion. There was no one, set final way to do it. We took his name off the letterhead, but retained the name Repository for Germinal Choice. Instead, I put on the letterhead 'Co-founders: Hermann J. Muller and Robert K. Graham'. He are that--I have the documents

VANCOURT: Do you think she might have been upset about the publicity?

GRAHAM: No, but I think the embarrassing circumstances of the first two births made her think we weren't doing things quite right. And there's some truth to that contention, as we were naive at first. Still are, but less so (laughs). At first, we had a one-page questionnaire which we sent to potential recipients, and we required the husband to sign the application. In the first case (in which the woman had formerly been convicted of a felony) there was a husband. But we didn't ask "Do you have a criminal record?" We do now. In the second case, there was the name of a husband on the application that was returned. It's never been quite clear--I've purposely not delved into the specifics too closely, because there's embarrassment all the way around, embarrassment that the husband didn't materialize. I really think that Dr. Blake fully intended to have a husband, but I think he decided not to get married. Meanwhile, she was pregnant. We had supplied the material. So now with our questionnaire we require a photocopy of the marriage certificate. And we've lengthened the questionnaire to ten pages.

VANCOURT: Then it's an absolute requirement, that a woman be married? Or would you consider any exceptions, say if a single woman wanted to have a child, and had the economic and psychological resources to raise it on her own?

GRAHAM: No, it's absolute. It's a matter of principle with us. We feel we're innovative enough without trying to disrupt the mores of our society

VANCOURT: If this became widely used--for example, if all women who had artificial insemination went to the Repository for Germinal Choice--wouldn't it be necessary to keep detailed records to avoid inadvertent inbreeding in the future? Especially if a relatively small number of donors is used for a large number of inseminations.

GRAHAM: Our present system is to ask in the questionnaire we send the potential recipient "Will you tell any child born of this arrangement the Repository number assigned to the germinal father?" If they agree to do that, then we make no special demands on them in that respect. If the child later wishes to marry, then he or she can ask the intended mate if the father's number is the same.

VANCOURT: And the chances are miniscule.

GRAHAM: Right. But at least it makes for an absolute elimination of consanguinity, more accurate even than our present social system. In the few cases in which they elect not to tell the child, in which they prefer for the child to believe the husband is also the biological father, we will not use the donor they chose again in that state. Any subsequent applications from that state will not get that donor as a possible choice.

VANCOURT: Does the Repository make any profit?

GRAHAM: No, the Repository is a non-profit organization. We do not charge for the semen. We charge only for the incidentals--that is, shipping costs, costs of maintaining liquid nitrogen (which keeps the semen frozen) over several months. And we do charge an evaluation fee, because we have to engage at least two physicians to pass on these ten-page questionnaires the applicants return.

VANCOURT: Is this essentially to make sure they're healthy?

GRAHAM: That's right. One or more physicians will talk to the individual, usually by telephone. So we do thoroughly go into the characteristics of the recipients.

VANCOURT: What other criteria do you have for selection of recipients, other than they be married and healthy?

GRAHAM: Married, healthy, the brighter the better. They must be 40 or under. The incidence of Down's syndrome goes up with the age of the mother. It never is very high, but Down's syndrome is a major tragedy. So we want to minimize that possibility.

VANCOURT: On the Phil Donahue Show [originally aired in Chicago on NBC on October 29, 1982] , Paul Smith said that the Repository sends the germinal material to the recipients in little ampules which you refer to as "straws" that are an eighth of an inch in diameter and two inches long. Is it a correct inference that one donation will be good for a number of inseminations?

GRAHAM: Oh, yes. One donation theoretically might inseminate 20 or 40 women. Because first of all, we use extenders to help in the freezing. The real trick in doing this successfully is to freeze the semen rapidly so that ice crystals won't form. The spermatazoa are preserved, without harm, indefinitely--at least 11 years that we're sure of. To elaborate on your question--by using extenders, we can fill one straw (which is sufficient for one insemination) with only a fraction of a donation. It's effective because the contents are placed at the os of the cervix. It's not necessary to fill the vagina wastefully as nature does--it's put right where it should go. We

supply three straws for each ovulation, and recommend that they use one the day before they are scheduled to ovulate, one the day they are due to ovulate, and one the day after. So we shotgun it a bit, to allow for miscalculations. I might digress at this point--we try to encourage the husband to do the insemination, to give him a sense of involvement. Also, not many physicians know how to do it, and even those who do will be away on week-ends, so if the woman ovulates then, the opportunity would be lost. So for a number of reasons, we try to make this a domestic program.

VANCOURT: What does Paul Smith do exactly?

GRAHAM: Paul makes our collections from donors. They wish it to be anonymous, so when Paul appears on television, he always wears a surgeon's mask so he won't be recognized. He also makes some deliveries of the germinal material, and the husband doesn't want Paul to be recognized either. There are a lot of delicate feelings involved in this whole project. So we have to maintain absolute anonymity.

VANCOURT: How do you feel generally about your treatment from the press?

GRAHAM: Well, initially the press and other media were highly speculative and mostly adverse. But this is slowly changing. They've made every crude, sexy joke they can think of, and now they've totally depleted their imaginations (laughs). But even at the start, when the media were quite adverse, the message got through to the people who needed us. And we were willing to go anyplace and submit

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GRAHAM: I think you're quite right.

VANCOURT: Do you think we're seeing any changes in that regard?

GRAHAM: I think so. By going over every study which bears on the subject of heredity versus environment, Arthur Jensen has concluded that variations in intelligence are about 69% hereditary, 25% environmental, and 5% attributable to test error. I think this is a fact of life, and it will be increasingly recognized. Cattell has said, and said very well, that hereditary improvement in the intellectual level of the population is by far the most permanent and the least expensive way to raise the level of capability in the population. But it's not being sufficiently utilized. We spend billions on education, which is important. But there you have to start over again with each generation, whereas an hereditary improvement continues on for generations.

VANCOURT: Are you basically optimistic or pessimistic about the future of eugenics?

GRAHAM: I'm optimistic. It has a long way to go to become a common consideration when people contemplate parenthood. But I think with further education, people will pay more attention to it. And I think probably lots of people who don't need our services are being made more cognizant by hearing about us and our concerns for good heredity in a child. Slowly people are becoming more "...eugenics-minded".

VANCOURT: Some people involved in eugenics have religious or spiritual motivations. Do you see it as a humanitarian endeavor, or do you have some kind of religious basis for it?

GRAHAM: I'm not myself a very spiritual person.

VANCOURT: So you'd characterize your motives as essentially humanitarian?

GRAHAM: Yes, essentially. Look at it from the point of view of the parents. These are couples who want a child, but can't have one because the husband is infertile. With this program, they can have a child, and they can maximize the probability of having a bright, healthy and creative child. Consider the child, too. As a consequence he spends his life with the genes of the donor, as well as those of the mother. Why not provide the best genes possible?

VANCOURT: Thank you so much for a fascinating interview.

GRAHAM: It was my pleasure.

Wright and Wrong

Wright and wrong.

By RICHARD LYNN

Mr. Lynn is a professor of psychology at the University of Ulster in Northern Ireland.

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THE MORAL ANIMAL: WHY WE ARE THE WAY WE ARE, BY ROBERT WRIGHT
(PANTHEON, 467 PP., \$27.50)

ROBERT WRIGHT attempts to explain man as a moral animal in terms of "evolutionary psychology," a nascent academic discipline based on the principle that humans are programmed by evolution to secure the replication of their genes. They do this primarily by having and caring for children and by helping their kinsfolk and other members of their ethnic or racial group.

Evolutionary psychology is therefore nothing other than the more familiar sociobiology, but Mr. Wright says he prefers not to use that term because it has conservative connotations. I think this is a mistake. The connotations of a body of knowledge cannot be changed simply by giving it a new name.

His treatment has two merits and three weaknesses. The first of its merits is that Mr. Wright has correctly discerned that the sociobiological model of human behavior is a great advance on its predecessor, the cultural determinist theory, which held that our behavior is entirely determined by the cultural environment in which we are raised. The leading lights of this theory were such people as Margaret Mead and B. F. Skinner, who believed that humans are infinitely malleable.

The second merit of Mr. Wright's book is that he gives an accurate account of some of sociobiology's principal propositions. He is, for instance, sound on the differences between men and women. Contrary to the assertions of cultural determinists, sociobiology teaches that men and women are psychologically different. For one thing, men are by nature more promiscuous than women because this way they can increase the number of their offspring; the same is not possible for women, so having multiple partners does not secure them an evolutionary advantage.

However, Mr. Wright's book also has three weaknesses. The first of these is that the conclusions of sociobiology are presented through rose-tinted spectacles. Mr. Wright asserts that sociobiology teaches that humans are naturally good, because they are biologically programmed to help one another. How comforting!

This, however, is a profound misunderstanding of the message of sociobiology, which is rather that human beings are amoral or immoral animals. Sociobiology teaches that humans are programmed to promote the survival of their own genes and that they assist others only insofar as this is likely to serve the genetic objective. A much better title for the book would have been *The Selfish Gene*, but as this has already been used by Richard Dawkins, Mr. Wright might have called his book *The Amoral Animal*.

Because of his wish to promote the view that sociobiology teaches that humans are naturally moral animals, Mr. Wright omits or summarily dismisses those propositions of sociobiology which show that the human being is a rather nasty animal. The first of these is that human males are biologically programmed to stratify their societies into status hierarchies. Males compete to become top dog, or at least to become middle dogs. The top dogs allocate privileges primarily to themselves. They fight off challenges from underdogs, and maintain their status by cunning, the inculcation of fear, and brute force.

Sociobiologists have shown that these status hierarchies are present among all social animals and that male striving for status is programmed by the hormone testosterone. It is not particularly pretty to see powerful males grabbing and keeping the goodies largely for themselves, but sociobiology teaches that this is the way men are.

The second major respect in which we are hardly moral animals is our propensity for killing one another. As animals go, humans are particularly prone to kill one another, particularly in group conflicts and wars. Indeed, our only rivals in this regard in the entire animal kingdom are the ants.

Sociobiologists have concluded that the human propensity for warfare and even genocide is biologically programmed. The explanation is that if we can exterminate other groups, we can move into their territory. This means that there are going to be more of us and our genes and fewer of them and their genes. This is particularly the case when the rival group belongs to a different race from our own, because its members have few genes in common with us. This hardly befits "the moral animal." Mr. Wright presents a sanitized version of sociobiology in which much has been suppressed.

The second weakness of Mr. Wright's book lies in his discussion of the implications of sociobiology for political theory. As sociobiology developed in the 1970s it was quickly realized that it confirmed the conservative view of human nature. If human males are

biologically programmed to compete for rank in status hierarchies, the implication is that the egalitarian utopias cherished by the liberal Left, in which all men are equals, won't work. They are against human nature. Conservatives always suspected this, and sociobiology corroborates their insight.

Similarly, sociobiology teaches that the ideal of a multiracial society in which all races live in harmony is another liberal-Left pipe dream. Humans are biologically programmed for group conflict, particularly between races that are genetically differentiated. Sociobiology teaches that we can forget the ideal of racial harmony. The best we can do is try to mitigate racial conflict as much as possible.

Liberal-Left academics were among the first to realize that sociobiology has profoundly conservative implications for political theory. This is why they mounted such a vigorous campaign against it, proclaiming it a fascist pseudo-science. Curiously, Mr. Wright does not go along with this conclusion. Time and again he asserts that sociobiology does not confirm conservative political theory. But this is not an arguable position and he is unable to make a case for it. In fact he must be the only person who has made a fairly serious study of sociobiology and yet is unwilling to concede that it confirms the conservative view of human nature.

The intellectual problem for the liberal Left now is to take this on board and regroup. Its members are in the same position as the Church after the publication of *The Origin of Species*. Darwin's book appeared to show that much of the Bible is plain wrong and therefore posed a serious threat to Christian belief. Some people reacted to this by attempting to suppress the implications of Darwinism -- the Robert Wright strategy. Others realized that the only hope was to accept the theory and jettison those beliefs that were obviously no longer tenable.

The liberal Left faces the same problem with sociobiology. Its task is to take seriously the conclusions of sociobiology regarding the dark side of human nature and think through what of its agenda can be salvaged. This book is a long way from meeting the case.

The book's third and perhaps most fundamental weakness is its failure to come to grips with the problem that, while sociobiology teaches that man has an inherent propensity to act selfishly, man is nevertheless a moral animal. Most human beings develop a conscience which dictates their behavior in countless directions. So the problem for someone writing a book called *The Moral Animal* is to explain how conscience is acquired.

Unfortunately for Mr. Wright, sociobiology does not attempt to explain things like this. To understand how humans develop a conscience one could shift to Pavlovian conditioning theory, which says that parents condition their children by approval and disapproval to behave in acceptable ways, or to modeling theory, which says that children adopt their parents as models for a wide range of behaviors and values. If Robert Wright wished to explain why man is a

uniquely moral animal, he chose the wrong theory.

Ancient Eugenics

The Arnold Prize Essay for 1913

by Allen G. Roper, B.A.

Late Scholar of Keble College

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ANCIENT EUGENICS

The preface to a history of Eugenics may be compiled from barbarism, for the first Eugenist was not the Spartan legislator, but the primitive savage who killed his sickly child. The cosmic process was checked and superseded by another as ruthless as Nature's own method of elimination. The lower the community, the more rapidly it reproduces itself. There is an extravagant production of raw material, and the way of Nature, "red in tooth and claw," is the ruthless rejection of all that is superfluous. When there is no differential birth-rate, the result of foresight and self-control, and the attainment of a higher level of civilization, Nature adjusts the balance by means of a differential death-rate. In the days when human or animal foe threatened on every side, when "force and fraud were the two cardinal virtues," and the life of man was "solitary, poor, nasty, brutish, and short," natural selection must have been ruthless and severe. Some conception of the wasteful processes of Nature dawned upon the

savage mind. While they lived their short lives, the weakly, the deformed, and the superfluous were a burden to the tribe. Human law, super seding natural law, strove to eliminate them at birth. This was the atavistic basis on which subsequent Eugenics was built.

In Greece, the theory underwent a logical development. Even in a later age of dawning civilization, war confronted men with this same problem of the ruthless extermination of the unfit. It was recognized that the occurrence of the non-viable child was inevitable, but remedial legislation, reaching a step further back, essayed by anticipation to reduce this waste of life to a minimum. It was realized that to increase the productivity of the best stock is a more important measure than to repress the productivity of the worst. Out of the Negative aspect of Eugenics develops the Positive.

With the advance of civilization, conditions become increasingly stable: war is still imminent, but, instead of being an essential element of existence, it is regarded as a necessary evil. Nature, forging additional weapons, hastens the elimination of the unfit by disease. Some form of Eugenics is still necessary, but in the altered conditions a new ideal is born. The conception of a race of warriors merges into the ideal of a state of healthy citizens. All these formulations of Eugenics are aristocratic and parochial; they are to benefit the people of a single state, and only a section within that state. Any wider conception of racial regeneration was impossible to a people who dichotomized the state into free citizens and living instruments, the world into Greeks and barbarians.

The breakdown of the city states brought a cosmopolitanism which, instead of widening the ideal of humanity, centred itself on the interests of the individual. Modern Eugenics is based on Evolution- not a passive form, but one that concedes some latitude to the guiding action of the human will (Galton, " Essays in Eugenics," p. 68.). Without some such postulate, egotism becomes a rational creed amid the social welter and world weariness of a deliquescent civilization. Man is cut off sharply and definitely from all that went before and all that follows. Only the isolated ego

remains, "a sort of complementary Nirvana," and the philosophy of "Ichsucht" of selfcentred individualism ends in Hedonism or ascetic alienation from an inexplicable universe. No scheme of social reform can bear fruit in such an atmosphere of philosophic negation. Like Plato's philosopher, man shelters from the tempest behind the wall.

Three conceptions of the cosmic process are possible. We may maintain that there is no such thing as progress, that life is a mere pointless reiteration of age after age till there comes the predestined cataclysm; we may believe in a primeval age of innocence and happiness, a golden age, or a state of nature disablement ideal; finally, we may trust in the gradual evolution of mankind towards a terrestrial Paradise, hoping that "on our heels a fresh perfection treads, a power more strong in beauty, born of us, and fated to excel us as we pass in glory that old darkness." This conception of man as heir of all the ages, though vaguely anticipated by Anaximander, was impossible to an age which knew nothing of biology. No system of Eugenics is likely to flourish side by side with the belief in an unprogressive or degenerate humanity, steadily and inevitably declining from primordial perfection. So long as the city state survived, patriotism prevailed over pessimism, and ideals of regeneration were more than the idle dreams of the philosopher. But the growing prominence assigned to the theoretic life shows the gradual growth of despair. After Aristotle, Eugenics takes its place among the forgotten ideals of the past.

But a thought or a theory which has once quickened into life becomes immortal. It may change its form, but it never perishes. Throughout time it is ceaselessly renewing its existence. While infanticide is everywhere disappearing, there remain still the principles simultaneously developed. Three centuries ago Eugenics was the Utopian dream of an imprisoned monk. A century later Steele, more in jest than in earnest, suggested that one might wear any passion out of a family by culture, as skillful gardeners blot a colour out of a tulip that hurts its beauty. (Tatler, vol. ii., No. I75, I709; quoted by Havelock Ellis, "Social Hygiene.") But neither science nor public opinion was ready to respond. It was not till late in the nineteenth century that the crude

human breeding of the Spartans, in altered form and in new conditions, became the scientific stirpiculture of Galton.

To read the small minuscule of Ancient Eugenics> it is expedient first to scan the uncials of modern theory. Beneath the new form engendered by altered conditions, with the unessential and accidental passing away into other combinations, there remains an essential identity of form. History can only be an attempted interpretation of earlier ages by the modes of thought current in our own. The foreground of human life we can see with exactness, but the past is foreshortened by the atmosphere of time.

Under the modern conditions of civilization, elimination by international or individual violence is steadily decreasing. Nature has found an equally effective weapon in the process of urbanization. Disease spreads rapidly amid conditions inimical in the highest degree to healthy living. But while infanticide forms the basis on which the ancient system was built, the abolition of that practice has been the starting-point for the New Eugenics. It has confronted us with problems unknown to a preChristian age.

The Ancients attempted to combat the wasteful processes of Nature by eliminating the non-viable at birth; our efforts, on the contrary, have been directed to the prolongation of their lives. Instead of sacrificing the unfit in the interests of the fit, we have employed every resource of modern science " to keep alight the feeble flame of life in the baseborn child of a degenerate parent." (Tredgold, "Eugenics and Future Progress of Man.")

The weapons forged by Nature have been taken from her hands. Side by side with the rapid multiplication of the unfit there has been a marked decline in the birth-rate of the useful classes of the community. The relatively strongest survive, but their strength has suffered from the influences which brought extinction to the weaker. This is one of the problems caused by a humaner sentiment.

In the second place, the abolition of infanticide has confronted us with the necessity of knowledge. The methods of the breeder are ruthless and precise. He slaughters or he

spares, and divergent variations are a matter of no moment. So the Spartans and Plato, with this analogy before them, were saved from the necessity of any deeper knowledge by the preventive check of infanticide. If Nature erred in her intentions, this art was at hand to rectify her mistakes. Infanticide saved the Greeks from the problems of heredity.

For all practical purposes our knowledge is as infinitesimal as in the days of Plato. The methods of biometry and statistics, the actuarial side of heredity, deal merely with the characteristics of groups. Mendelism, dealing with the individual, finds verification in man only in the case of feeble-mindedness and in the inheritance of certain deformities. Any constructive scheme of Eugenics is impossible under the limitations of our knowledge.

Apart from the question of heredity, there is the problem of selection. Though physique is easily estimated, and correlated, perhaps, as Galton held, with other good qualities, the modern Eugenist has before him no simple homogeneous ideal. He has to recognize the psychical as well as the physical aspect of the intricate mosaic of human personality. The self-sacrificers and the self-tormentors claim their place no less than a Marcus Aurelius or an Adam Bede. (Galton, "Essays in Eugenics," p. 36.) Even though we hold it possible to compile a list of qualities for selection universally acceptable, we cannot, under the present limitations of our knowledge, prove personal value to be synonymous with reproductive value. No scheme of economic Eugenics, inferring the aptitudes of individuals from social position or income, can solve the hopeless perplexities that wait upon constructive methods. Passing from the municipality to the world, Eugenics is confronted by the conflicting ideals not only of alternative characters, but also of incompatible civilizations. Since differentiation is an indispensable factor in human progress, there arises the further problem of a Eugenic ethnology.

This, then, is the shape modern theory has assumed in answer to the demands of modern civilization. Lost in Egotism, Eugenics found opposition no less formidable in a spirit of imprudent altruism. Only the scientific altruism of to-day

has rendered it once more practicable.

From its origin in the unreflective intuition of the atavistic past we will trace the growth of the theory till it passed into the pages of Aristotle, and became lost to view amid the throes of a pessimistic and decadent age.

Infanticide and Exposure, terms which in early ages were virtually synonymous, appear on first consideration to have been practised among uncivilized tribes for a bewildering multiplicity of reasons. (1 McLennan, "Studies in Ancient History," chap. vii., passim.) There is the female infanticide of China and the Isles of the Southern Pacific, the male infanticide of the Abipones of Paraguay, and the indiscriminate massacre of the Gagas, who, killing every child alike, steal from a neighbouring tribe. There are the Indians who offer up children to Moloch or drown them in the Ganges; the Carthaginians sacrifice them to Kronos, the Mexicans to the rain god. There is the murder of twins and albinos in Arebo, and the cannibalism of the Aborigines. In Mingrelia, "when they have not the wherewithal to maintain them, they hold it a piece of charity to murder infants new born." There are the Biluchi, who kill all their natural children, and there is the modern factor of shame.

Co-existing with all these various practices there is the definitely Eugenic motive. Among the Aborigines, all deformed children are killed as soon as born. The savages of Guiana kill any child that is "deformed, feeble, or bothersome." The Fans kill all sickly children. In Central America "it is suspected that infant murder is responsible for the rarity of the deformed." In Tonquin we hear of a law which forbids the exposing or strangling of children, be they ever so deformed. In Japan, deformed children were killed or reared according to the father's pleasure. Among the Prussians the aged and infirm, the sick and deformed, were unhesitatingly put to death.

The question arises, therefore, whether the Eugenic motive first led to the institution of infanticide, or whether it was merely a by-product, a later growth, springing out of a practice which owed its inception to totally different causes. Setting aside infanticide when prompted by mere

brutality or cannibalistic cravings, and excluding the modern factor of shame, which was unknown among primitive peoples, the motives may be classified as irrational or rational.

Irrational motives are the religious or superstitious, rational the Eugenic. Between these-two there is a wide line of demarcation.

The origin of religious infanticide is obscure. It may be merely evidence of fiendish passion. There may be in it something of a sacramental meal, or possibly the primal idea in its many variations is the gain of some benefit by the sacrifice of something of value. In any case, whatever the basic intention, the religious motive in infanticide has no relation to the Eugenic. Such melancholy theology implies some degree of social organization, and was, therefore, a later and independent conception.

Only some powerful and long-continued pressure could have brought about the reversal of sentiments which must have been innate in primitive man as much as in other animals. The impelling sources were two--want and war, or both in combination -- not want in the form of famine, which, working its own cure, not infrequently leaves an increased prosperity behind it, nor war as brief and desolating in its effects as warfare of to-day, but rather that long enduring warfare pressing on generation after generation, which is the State of Hostility. This was the normal state of early man, a condition of affairs inseparable from independent life in small communities. Jacob and Esau go their separate ways, form different habits and different languages. Estrangement follows inevitably.

Even before man became his own worst enemy, brute creation must have furnished formidable foes to the naked and defenseless savage. There must have been pending want at this early stage of life. Under pressure of want, the group must adjust their numbers to the available food; under pressure of war, the same problem rises in still more urgent form. From these circumstances arises the practice of infanticide. It is circumstance, says Plato, and not man, which makes the laws. ("Laws," 709)

The nomadic group, passing from district to district in search of food, would find the children a burden. The first infanticides, casual rather than premeditated, were in the nature of a desertion. This preparing the way for an extension of the practice would lead to its adoption in the attempt to adjust numbers to the available food-supply. In the same way non-combatants would be regarded in the nature of impedimenta, since they consumed food without benefiting the group in return.

The first system of infanticide is, therefore, a policy of despair. The first victims would probably be the deformed, the maimed, and the weaklings, and female infanticide would follow. The problem of the maintenance of the race arising would lead to male infanticide whenever there was a deficiency of women; hence the custom, so far from being merely callous and brutal, and an argument for man's inferiority to the beast, is a proof of the highest intelligence.

These barbaric Eugenics, therefore, eliminating at birth those foredoomed to perish in the struggle for existence, were concerned with questions both of quantity and quality. Limitation of numbers, though it does not itself constitute "aggeneration" of the race, improves to a considerable degree the individuals of which the race is constituted. When the undesired children are out of the way} more attention can be paid to the desired. The savage bred recklessly, compensating his recklessness by infanticide, but a natural law of civilization has superseded the artificial law of primitive man. Control of reproduction, and resulting from it a falling birth-rate and a diminished death-rate, is a tendency which, first showing itself in Imperial Rome, is conspicuous to-day in every civilized community.

Infanticide, sanctioned by long usage, passed into the law of civilized nations. It appears in the legislation of Solon, (According to Sext. Empiricus (Pyrrhon., " Hypot.," iii. 24A, Solon conceded to the father the power of killing his children. Taken in conjunction with the limitation of the patria potestas, this appears improbable. According to

Plutarch (Solon, xxii.), he sanctioned the exposure of natural children.) though the grounds for its adoption are uncertain, while at Rome it was ordained by the Twelve Tables for a definitely Eugenic motive. A child conspicuously deformed was to be immediately destroyed. ("Insignis ad deformitatem" (Cic., "De Leg.," iii. 8)) But this limitation was frustrated by the control conceded to the father, which, restricted in Greece by all legislators alike, was as arbitrary in Rome as in Gaul. (Caes., "De Bell. Gall.," vi. 19.)

So at Rome the Eugenic motive fades into the background, and abuses become so frequent that they have to be checked by further legislation. Romulus is said to have forbidden the murder of sons and first-born daughters, (Dionysius, ii. 28.) and the "Lex Gentilicia" of the Fabii, who were in danger of extinction, decreed that every child born must be reared.

Under the Empire we find Seneca asserting once more the Eugenic justification of infanticide. "We drown the weakling and the monstrosity. It is not passion, but reason, to separate the useless from the fit." ("De Ira," i. 18.) Two distinct tendencies appear, control of reproduction diminishing infanticide among the upper classes, exposure taking its place among the lower.

The gloomy satirists of the Early Empire, instead of inveighing against the practice of exposure, abused the foresight which superseded it, and, so far from recognizing the tendency as one demanded in the altruistic interests of the race, saw in it merely egotistic subservience to the "captatores." The (greek omitted) of Gaius Julius or the *jus trium liberorum* of Augustus were futile attempts to combat an essential law of civilization.

The lower classes, on the contrary, propagating recklessly amid extreme pauperism— for rapid multiplication is the concomitant of bad environment -- resorted to exposure, which is the antithesis of Eugenic infanticide. Quintilian, indeed, declared that the exposed rarely survived, ("Dec.," cccvi. 6.) but the possibilities of gain must have led to frequent preservation— "vel ad lupanar vel ad servitutum."

(Lact., " De Vero Cultu.," lib. vi.) Occasionally the luckless child falls into the hands of -unscrupulous mendicants, who maim it and exhibit -it for gain. (Seneca, " Controv.," v. 33.) The existence of a numerous class of (Greek omitted) was a problem with which Pliny had to deal.

So the Christian Councils and the Christian Emperors set themselves vehemently to oppose the practice, but, using palliation instead of prevention, relieved the world of one problem and left another in its place. Despite the legislation of Constantine, Valentinian, and Justinian, exposure still continued. Marble vessels at the door of the churches produced the evil turning slide, and gradually there came into being hospitals, asylums, refuges, creches, receiving and tending the blind, the deaf, the dumb, the crippled, and defective, and with much good has also come much evil. Out of the failure of the Christian Fathers to find the right solution to a difficult problem has arisen the imperative need for the scientific altruism of Eugenics. Beyond infanticide, which, despite its many perversions, was in part Eugenic, the Romans made no conscious effort to build a scheme of racial regeneration. Whatever the appeal of " patient Lacedaemon" to the sentimental vulgarity of the Romans, they learnt no lesson from their admiration, though the biographer of Lycurgus lectured to Domitian. In the crude scheme of the Germans Tacitus finds no Eugenic moral. Restrictive marriage, perhaps, would have been a perilous lesson to teach to the Caesars, in whom, from Julius the epileptic to Nero the madman, psychologists find clear proof of hereditary insanity. Pliny's boast that for 600 years Rome had known no doctors shows that there was little interest among the Romans in schemes of hygiene or social reform. The Greeks themselves had long ago forgotten the teaching of Plato and Aristotle. Eugenics was lost in Stoicism and Stoicism was the creed of the Empire.

"This age is worse than the previous age, and our father will beget worse offspring still." And Aratus voices again the lament of Horace: " What an age the golden sires have left behind them, and your children will be worse even than you !" ("Phenom.," I23-I24.) The Golden Age of Rome lay for ever in the past.

In Greece, the theory underwent a logical development. State-controlled infanticide passes into a definite scheme of Negative Eugenics. The Negative aspect, giving rise to the Positive, fades into the background, and is retained merely as a check on the imperfections of a constructive scheme.

The systematized infanticide of Sparta, so far from being a recrudescence to atavism is an advance towards civilization. A custom which had been so deeply implanted in the race by ages of barbarism, and had resisted for centuries the incessant warfare of the Christian Fathers at Rome, would not easily have been uprooted in Greece. To supersede the reckless and capricious brutality of individuals by state infanticide on a definite basis was an essential gain to humanity, however much the Spartans may have been actuated by ulterior motives.

The destiny of the new-born child is no longer decreed in the privacy of the home; it is brought instead into the Council Hall before the Elders of the tribe. If well set up and strong, it is to be reared; otherwise, doomed as useless, it is cast into the fateful chasm on the slopes of Mount Taygetus, for they hold that "it was better for the child and the city that one not born from the beginning to comeliness and strength should not live." (Plut., "Lyc.," I6.)

Selective infanticide can only rest on a physical basis; there is no speculation in latent capacity. There was no list of unhealthy geniuses in the annals of Sparta, no St. Paul, no Mohammed, no Schumann, no De Quincey. Even if selection had been less rigorous, and genius had been conceded the right to live, environment would have denied it the right to develop. Sparta, content that Athens should be the Kulturstaat of Greece, cared only that the military hegemony should be her unchallenged right.

Once infanticide had become a system, its recognition as a *pis aller* would suggest regulation of marriage. By retention of infanticide as ancillary to the Constructive Scheme, the anomalies of heredity admitted of a simple and ruthless solution.

Positive Eugenics, not only in the past, but also today, is based on the analogy of animal breeding. The Spartans were the first to realize the inconsistency of improving the breed of their dogs and horses, and leaving to human kind the reckless propagation of the mentally defective, the diseased, and the unfit. (Ibid., xv. 25)

The use of analogy presents many pitfalls to be surmounted, and it is easy to see the absurdity of any conception of Eugenics as a sort of higher cattle-breeding. Full experimental control is not possible with man as it is with animals and plants. The analogy, literally accepted, would require a race of supermen, or some outside scientific authority manipulating a lower stock for its own advantage. Human Eugenics, to be effective, can never be a cold-blooded selection of partners from without; it must be voluntary, and from within, resulting from a new ethical sense of the individual's relation to the social group.

In the second place, the whole world of spiritual motives lies outside the province of the breeder. He is faced with no problem of differentiation. With a clear and homogeneous ideal before him, he sets himself to its attainment, killing and preserving with simple and ruthless precision. The Spartan system was partly a literal acceptance of the analogy, partly a spiritualization. There was no cold-blooded selection of partners, and no interference with sexual attraction. The Romantic ideal was the discovery of the late Greek world under the Roman Empire, but any sentiment that existed at Sparta was as unhampered as romance to-day in the theory of modern Eugenists.

Marriage was by simulated abductions. (Plut., "Lyc .," xv. 15.) The story quoted by Athenaeus of blind selection in a darkened room may be rejected as a palpable absurdity. (Ath., "Deipn.," xiii. 553c.) The only restriction was in the matter of age (Plut., "Lyc.," 15; Xen., "Reip. Lac.," i. 7.) -- a regulation which was the commonplace of Greek thought from the days of Hesiod ("Op. et Dies," 695 et seq.) to the time of Aristotle. Modern knowledge shows the influence of parental age not only upon the physique, but also upon the character of the offsprings (Mario, "Influence

of Age of Parents on Psychophysical Characters of Offspring." Paper read before Eugenics Congress, 1912)

The Spartans, therefore, were, within these limits, unfettered in their choice of brides, but were punished for abuse of the liberty conceded them. There was a penalty appointed for celibacy, a penalty for late marriage, but the third and the greatest penalty was for a bad marriages. (Stobaeus, lxvii. 16. Vide Plut., "Lysand.fin.," p. 451ab)

A further concession, the privilege only of the worthy, is seen in the compliances permitted on the part of the wife, that she might produce children for the state. So far from this practice being a recrudescence to the habits of the early savage, (Barker, "Political Thought of Plato and Aristotle," p. 153.) or an instance of an Aryan custom akin to the Hebrew Levirate, (Mahaffy, "Greek Literature," vol. ii., part 2, p. 68.) it seems obvious that it was a Eugenic measure suggested by the analogy of the breeder. (Plut., "Lyc.," xv. 30.) Thus, it appears that within Eugenic limits considerable play was conceded to human personality.

It is true that the bearing of children was regarded as the essential function of women, and this view, though biologically justified, seems to ignore that other aspect of marriage—mutual assistance and companionship. (Ibid., "Lyc. et Num.," 4.) But even in free Athens the ideal of a Nausicaa, Penelope, or Andromache, had been superseded long since by a conception of woman which regarded her as little more than a procreative drudge. Love marriages and genuine affection were commoner in Sparta than in Athens. The conduct of Agesistrata and Kratesickleia (Plut., "Agis," 20; "Kleom.," 37, 38.) on the death of their husbands, though it is evidence at a later date, shows traces of genuine feeling. In this respect, therefore, the Spartan practice was not remote from modern ideals, but infanticide, eliminating the unfit at birth, offered a solution of the problem which we can only hope to solve by the scientific application of the principles of heredity.

The Spartan method of breeding avoided the pitfalls of analogy; their aim implied a literal acceptance. The modern problem is the selection of qualities on a basis broad

enough to represent the natural differentiation of individuals and nations, the problem of a Eugenic ethnology. The Spartans, like the breeder of animals, bred for a single quality and a single uniform type. Setting life on a physical basis, regarding bodily efficiency as the only quality of use to a military brotherhood, they pursued their aim with the ruthless precision of the breeder. It was a narrow and egotistical aim, but consistent with a Constructive scheme of Eugenics which can only be maintained by eliminating undesired elements at birth.

At the same time the selection of physique has certain obvious advantages. To the Greeks, believing only in the beauty of the spirit when reflected in the beauty of the flesh, the good body was the necessary correlation of the good soul. Though there was no conscious assertion of this relation among the Spartans, there may have been some latent recognition helping to justify their aim. Moreover, while there is no dynamometer of intelligence, physique admits of easy estimation. There is therefore a certain justification for the simple and unscientific dogma of the Spartan lawgiver: "If the parents are strong, the children will be strong."

The Spartans realized that to secure the fitness of the child it must be guarded even before birth by bestowing due care on the food and habits of the future mother. Antenatal influences explain many of the apparent anomalies of heredity, but, while recognizing the value of the Spartan aim, a nobler conception of humanity rejects their method. Sedentary occupations can no longer be assigned to slaves. (Xen., "Reip. Lac.," 3.) Society still rests on a basis of lower labour. He "that holdeth the plough" must still "maintain the state of the world," but he is no longer a mere means, a living instrument, excluded from every political privilege and every social reform. The limited and aristocratic Eugenics of Sparta is amplified into a scheme which embraces every class of the community. But this extension involves fresh complexities. By state interference in various ways, such as endeavours to modify "the influence of the factory system on the women who would be the mothers of the next generation," we attempt to palliate where the Spartans were content to neglect.

The Spartans recognized that environment as well as heredity is a factor in the development of man. There is a scheme of physical education for men and women, and the one narrow aim was so exclusively pursued, that it was said of them that they could not even read. (Isoc., "Panath. Or.," xv. 277.) Modern education on its wider basis affords no parallel with the Spartan, but the bureaucratic control of the buagor, the ilarch, and the melliran, and a common centre of supervision have similarities with certain modern ideals. It is claimed that the control already established for certain classes of children, during limited periods, should be exerted over all children, and extend through the whole course of their evolution. There is to be compulsory control as well as compulsory education, and there is an institution which is to be frequented by all children, on whose development there is no effective control at home. (Dr. Querton, "On Practical Organization of Eugenic Action." Read before Eugenics Congress.) These methodically organized institutions, harmonizing well enough with the monistic view of the Spartan state, could never be adjusted to modern conceptions of individual right.

Apart from the question of quality, there is also the question of quantity. Modern Eugenists are faced with the problem of the diminishing numbers of the upper classes and the rapid multiplication of the lower. The Spartans were concerned with the same problem in a different aspect; this tendency, suffered to run its course unchecked, meant to them extermination by war; to-day it means elimination by disease.

The Spartans were a small immigrant band, face to face with an extensive and powerful autochthonous population a camp in the centre of a hostile country. "We are few in the midst of many enemies" was the warning spoken by Brasidas. (Thuc., iv. 126.), "and this position of constant danger affected the problem in two ways. There must be no falling birth-rate among the Spartans, no unchecked fertility among their subjects.

Three measures were employed to maintain the number of the Spartans: prevention of emigration, (Xen., "Reip. Lac.,"

xiv.) penalties for celibacy, (Plut., "Lyc.," 15; Athenaeus, xiii. 553c.) and rewards for fertility. (Ar., "Pol.," 1270b.) The man with three children was to be excused the night watch, the man with four was to be immune from taxation. A third measure known to the ancient world, the enfranchisement of aliens, though adopted at times under the ancient Kings, (Ibid., 1270a.) was rendered impossible by the later exclusion of every foreigner from the land. Avoidance of moral or physical corruption was set before preservation of numbers. (Plut., "Lyc.," 27) The alien is a disturbing element in any Eugenic scheme.

The natural tendency of civilization, a declining birth-rate, would have brought destruction upon Sparta. Nevertheless, this attempt to maintain the numbers of the citizens seems to have met with little success. Xenophon speaks of Sparta as having the smallest population in Greece. ("Reip. Lac.," I.) Aristotle tells us that once the numbers of the Spartans amounted to 10,000: in his time they were not even 1,000, though the country was able to support 1,500 horse and 30,000 foot. The city unable to support one shock was ruined. Aristotle finds the cause of failure in the unequal division of property. ("Pol.," 1270a.) But nowhere have attempts to interfere with the downward course of the birth-rate met with success: they were doomed to failure in Sparta as they failed in Imperial Rome. There is a moral in the tale of Plutarch, that Antiorus, the only son of Lycurgus, died childless, dooming the race to extinction. ("Lyc.," xxxi. 25.)

In limiting the numbers of the subject population, the drastic methods of the (greek omitted) admitted of no failure. Infanticide was brutal, but it was set on a rational basis; this indiscriminate and covert massacre on the vague pretext of fear or suspicion, was possible only to a people not fully emerged from barbarism. On one occasion more than 2,000 were made away with, "on account of their youth and great numbers." Even Plutarch, with all his Laconism, censured the (Greek Omitted) as an "abominable work," and refused it a place among the measures of Lycurgus. ("Lyc.," xxviii. 20.)

The productivity of the worst classes must be checked no

less to-day in the interests of Eugenics, but not by such methods as these. We may improve their environment, so that response to improved conditions may result in a natural limitation, or with the increase of knowledge we may forbid their propagation, but the method of massacre died with the decadence of Sparta.

These inchoate Eugenics had their measure of success. The modern school of Anthro-geography, following in the footsteps of Mill and Buckle in an older generation, would attribute to material environment their limitations and their greatness. Surrounded by discontented subjects and hostile serfs, with enemies at their very doors, and no point in the land a day's march away, it was natural that they passed their days as in a camp: shut away in "hollow Lacedaemon with its many vales," it was natural that they had no share in the progress of the world round them. But in the seventh century Lyric poetry had found a new home on the banks of the Eurotas. Terpander the Lesbian, Alcman the Lydian) Cinaethon the Spartan, show that there was a time when Lacedaemon also had cultivated the Muses. The nobles lived luxuriously: the individual was free.

The Lycurgean discipline was therefore no arbitrary product of circumstances: it was a deliberate and calculated policy. As such, it is easy to criticize its limitations, to assert that it mistook the means for the end, that it fitted the citizen only for war, and unfitted him for peace. (Ar., "Pol.," 1325a, 1333b) It is wilful neglect of facts to declare that the only success achieved was the success of the disciplined against the undisciplined: that the only veneration the Spartans received was the veneration of conquerors. (Ibid., 1338b 1324b)

Their whole aim was narrow, calculated, and egotistic; their Eugenic system was merely ancillary to the one occupation of war: neglecting all the complexity of man's psychical nature, it aimed at the improvement of a single aspect of humanity, and that not the highest: sacrificing the Sudra caste in the interests of the Brahmins, it aimed only at the production of a breed of supermen. Nevertheless, it is clear that within its narrow confines this rude system succeeded. Sparta has been proclaimed the only state in which the

physical improvement of the race was undoubted, while the chastity and refinement of both sexes was unimpaired.

(Mahaffy, "Greek Literature," vol. ii., part I, p. 201.) "It is easy to see," declared Xenophon, "that these measures with regard to child-bearing, opposed as they were to the customs of the rest of Greece, produced a race excelling in size and strength. Not easily would one find people healthier or more physically useful than the Spartans." ("Reip. Lac.," i. 10; V. 9.)

The Lampito of Aristophanes, introduced as the representative of her race, shows how the Spartan women impressed the rest of Greece. Beauty, physique, self-control—these were the accepted characteristics of the type. ("Lysistrat," 78) Sparta was the proverbial land of fair women. (Athenaeus, xiii. 556a)

The direct influence of Spartan Eugenics was infinitesimal. It was an honour to have a Spartan nurse and good form to affect the rude abruptness of the Spartan manner, but no attempt was ever made to adopt their training or institutions.

There were the paper-polities of Plato and Diogenes, but their legacy to the world was only "Words and writings." (Plut., "Lyc.," 3I .) The Athenians of the fifth century had nothing but contempt for the institutions of their rivals, voiced in the patriotic travesties of Euripides. (Thuc., ii. 39; Xen., "Mem.," iii. Eurip., "Androm.," 597, etc.) Sparta was the national foe, and Sparta fell into early decadence.

Xenophon lamented that in his time the Spartans neither obeyed God nor the Laws of Lycurgus. (Xen., "Reip. Lac.," xiv. 7.) Already, when Plato wrote the Laws, there are signs that Sparta was falling into disrepute, and the Politics of Aristotle shows an imminent degeneracy: Ares bears the yoke of Aphrodite, liberty has become license. Agis III. attempted in vain to restore the old Lycurgean discipline, which had become a mere shadow and a name. Kleomenes attained some measure of success, but foreign arms intervened. Nevertheless, the empty husk of the ancient system lasted with strange persistence through centuries of neglect. If the Spartan Eugenics had taken some account of

those other tendencies of its earlier history, its influence on the world might have been of greater importance.

The Ancients, struck by certain obvious resemblances, believed that the Spartan constitution was in part a plagiarism of the Cretan. The laws and institutions of both countries aimed at creating a class of warriors, (Plato, "Laws," 630 E.) but in general most new things are an improvement upon the old, (Ar., "Pol.," 1272a.) and the Cretans never reached back beyond the education of the youth.

The physical training at Crete may have suggested its parallel at Sparta} but its broader basis of culture belonged to Crete alone. Like Sparta, Crete endeavoured by artificial interference to regulate the growth of its population, raising its numbers by forbidding celibacy, reducing them by a curious measure which has no parallel elsewhere. (Ibid., 1272a. According to McLennan, the practice would be the result of female infanticide.) In this matter of Eugenics, therefore, Sparta owes but little to Crete.

The constitution of Carthage was also declared by Aristotle to bear a close resemblance in some particulars to the Spartan. (Ibid., 1273a) But there is no trace at Carthage of any institution having a Eugenic tendency. There is infanticide, but infanticide merely as a phase of a general custom of human sacrifice. (Diod., xx. 14; Plut., "De sera num. vindic.," 6.)

There is, however, one other ancient race, amongst whom we find traces of Eugenic practice—the sturdy warriors of Germania Transrhenana, or Barbaria. They were not, indeed, an utterly primitive people: of art and literature they were almost entirely ignorant; of the civilization of Greek and Italian cities they knew nothing; but they possessed a definite social organization, and a religion not lacking in nobler elements.

Unfortunately, our only authority is a writer concerned more with ethics than history, treating facts with a certain Procrustean freedom to fit a preconceived morality. History

becomes the handmaid to moral contrast, and there are the errors of imperfect information, on which no light is thrown by others who have dealt with this same people.

It was a system) so far as one could Judge, that relied on positive methods. " To limit the number of their children or to put to death any of the later born, they regarded as an act repugnant to human nature (flagitium). There are no rewards for the childless." (Tac. " German.," I9 and 20.) Two distinct points are involved in this approbation-uncontrolled reproduction and absence of callous infanticide. At Rome, among the many excuses for exposure or infanticide recognized by custom, was the birth of a child after the will had been made. (Cic., "De Oratore," i. 57.) This does not necessarily prove the total absence of infanticide among the Germans; it merely indicates the prohibition of the practice from callous indolence or on the grounds of superfluity. Tacitus, however, makes the same statement of the Jews, to whom, having before them the injunction to increase and multiply, the whole practice would naturally be abhorrent. Possibly, therefore, the Germans, in contradistinction to almost all ancient peoples, had refused to sanction the custom on any basis whatever.

In the matter of uncontrolled reproduction, a high birth-rate, though negatived almost invariably by a corresponding death-rate, was a natural ideal amongst a people threatened with constant depletion by the severity of military selection. Tacitus, ignorant of relativism, failed to see that the evil he deprecated in Rome was the inevitable result of the tendency which he lauded amongst the Germans.

The basis of selection was stature as well as strength. Infanticide, therefore, would have been impossible as a check on failure. Early marriages were forbidden, but instead of a penalty on the childless, we find an encouragement of celibacy. (Cues., "Bell. Gall.," vi. 21) It seems, therefore, that there was some endeavour to limit the number of children, which found no place in the Tacitean scheme of German morality.

In place of the Spartan a compliance" we find polygamy on a

limited scale, conceded as a privilege only to a few " on account of noble birth." Satisfied with this regulation of nature, they paid no attention to nurture. The children grew to manhood, naked and uncared for, with no distinction between master and slave. The women, it seems, like the women of the Republic, followed their husbands into war. (Strabo, 20.)

The results of this system appear inevitable enough. We find a race conspicuous for its stature and strength, but conspicuous also for its absence of moral courage. The children, says Tacitus, reproduce the vigour of their parents, and he speaks of their stature and strength of limb as the admiration of the Romans. Their tallness is frequently a theme for comment in the " Histories." ("Hist-," iv. I, I4; v.14) When Rome fell to the Flavians, it was assumed that anyone of exceptional stature was a Vitellianist and a German.

But they were mere machines with no moral courage to turn their strength to account. With Spartan training to develop the raw material of inheritance, they would have been a different race. They were incapable of enduring hardships to which they had not been inured ("German.," 4): their frames were huge, but vigorous only for attack; their strength was great for sudden effort, but they could not endure wounds. (Annals," ii. I4.) Their courage was the frenzy of the Berserk, not the disciplined valour of the Spartan hoplite.

In time their stature must have deteriorated. While the children of tall parents tend to be taller than the average, there is a gradual return to the mean. However severe and continuous the selection, there is a point beyond which advance cannot go. (See Eugenics Review, July, 1912; Gossack, "Origin of Human Abnormalities.")

The German Eugenics seem to have left no impression upon the Roman mind. Their stature and physique were attributed merely to chastity. (Caes ., "Bell. Gall.," vi. 21.) The German system, therefore, led nowhere in antiquity: the Spartan system led on to the theories of Plato and Aristotle.

The fifth century at Athens was an age of criticism and self-consciousness: the era of reflection had followed the era of intuition, and scepticism brought iconoclasm which shattered the ancient symbols. There were abolitionists, collectivists, social reformers in every phase, but no scheme of Eugenics till Plato. Intensity of anti-Spartan sentiment may have put such theories beyond the pale of the patriot. Social reformers could end their arguments for communism or promiscuity among Hyperboreans, Libyans, and Agathyrsi; but Eugenics was a creed peculiar to the hereditary foe. Nevertheless, certain aspects of the question had been for centuries the commonplace of Greek thought. Even in the proverbial stage of Greek philosophy the gnomic poets among their isolated apothegms have caught some facets of the truth.

In Theognis there is a glimpse of the analogy between the breeding of animals and human kind and almost an anticipatory scheme of Eugenics: "We seek well-bred rams and sheep and horses and one wishes to breed from these. Yet a good man is willing to marry an evil wife, if she bring him wealth: nor does a woman refuse to marry an evil husband who is rich. For men reverence money, and the good marry the evil, and the evil the good. Wealth has confounded the race." (Theog., v. 183.)

"His starting-point is the true one," remarks the ancient commentator, "for he begins with good birth. He thought that neither man nor any other living creature could be good unless those who were to give him birth were good. So he used the analogy of other animals which are not reared carelessly, but tended with individual attention that they may be noblest. These words of the poet show that men do not know how to bear children, and so the race degenerates, the worse ever mingling with the better. Most people imagine that the poet is merely indicting the custom of marrying the low-born and vicious for the sake of money. To me it seems that this is an indictment of man's ignorance of his own life." (Stobaeus, lxxxviii.) Lycurgus, according to Plutarch, (Plut., "Lyc.," xv. 25.) used this analogy to demonstrate the folly of other cities where the husbands, keeping their wives in seclusion, beget children from them even if mad, diseased, or past their prime. This was the

starting-point of the Spartan Eugenics, as it has been the starting-point of the Modern: at Athens it was never more than the sententious maxim of an early poet.

The evils of disparity of age, the thought that "one must consider the ages of those who are brought together," (Cf. Stobaeus, 7I. a 20.) had formed themes for Hesiod, (695 et seq.) Sappho, (20.) and Theognis.(457.) Pythagoras, it is said, had discussed the bad effects of early marriage:(Muller, "Fr. Hist. Gk.," ii. 278.) Solon had legislated upon it; (Plut., "Sol.," xx. 25.) and had dealt no less with that other recognized evil of antiquity and modern times, the mercenary marriage. (Ibid., I5.)

A problem that obsessed the Greeks was the relative influence of nature and nurture, of gametic and non-gametic causes. It is a question almost invariably of morals, though the dominant aestheticism of Greek thought may have reduced the problem to a single issue: "Thou art unpleasing to look upon and thy character is like to thy form." (Stobseus, xc. 9)

"Most children are worse than their parents, few are better."("Odyss.," ii. 227.) "The evil are not wholly evil from birth, but associating with the evil they have learnt unseemly deeds." (Theog., 305) "Sometimes a noble offspring does not spring from well-born parents, nor an evil child from useless parents." (Soph., "Tyro, Fr." 583.) But the general view of heredity was as fatalistic as Ibsenism. No education can make the bad man good: no AEsculapius can cure the moral taint. (Theog., 432.) Just as roses and hyacinths do not spring from squills, so from a slave-woman no free child can be born. (Ibid., 537) Antigone of Sophocles is fierce because her father was fierce,(47I.) just as the Brand of Ibsen was obstinate because his mother was obstinate.

Modern knowledge has justified the Greeks in attributing this dominance to heredity. Men do not gather grapes of thorns, or figs of thistles: the total contribution of environment is merely opportunity: it can only aid or retard the development of genetic character. The Greeks, except in the dramatic conception of an ancestral curse, or in the

inherited pollution of ancient sacrilege, never traced causes back beyond the immediate progenitors. Galton held that the individual was the arithmetic mean of three different quantities, his father and mother, and the whole species of maternal and paternal ancestors, going back in a double series to the very beginnings of all life. ("Natural Inheritance.") Greek thought never concerned itself with this third and unknown datum. Mendelism has brought us back once more to the immediate parents.

Side by side with this interest in questions of nature and nurture is the dawn of that individualistic spirit, which culminated at last in egotistic contempt of offspring and marriage. Heraclitus is the forerunner of Stoicism, Democritus of Epicureanism, and the negative teaching of the sophists is the precursor of that atomistic conception of society which reduced it to a mere complex of self-centred units.

If there had been any attempt to systematize these fragmentary conceptions, we should find it mirrored in the pages of Euripides. All the inconsistencies of current theory are voiced by opposing characters, every speculation that was born "in that great seething chaos of hope and despair," thesis and antithesis but no synthesis before Plato. It is the diagnosis and not the remedy which interests Euripides.

There is the question of the marriage age. It is a baneful thing to give one's children in wedlock to the aged. ("Fr." I (Phcenix)) The aged husband is a bane to the youthful wife. ("Fr." 2 (Dan.)) No less is it an evil to wed youth to youth, for the vigour of the husband endures for longer, but a woman more quickly fades from her prime. ("Fr." 8 (AEol.))

There is the denunciation, too, of mercenary marriage. Those who marry for position or wealth know not how to marry. ("Fr." I6 (Melanippe); "Elec.," 1096.) Nature endures, wealth is fleeting. ("Elec.," 94I.) Is it not therefore the duty of the man, who takes good counsel, to marry the noble, and to give in marriage among the noble, and to have no desire for an evil wedlock, even if one should thereby win a

wealthy dower? ("Androm.," I279 et seq.) There is much discussion of the relative influence of heredity and environment. ("Elec.," 94I.) Is it not wonderful that poor soil, blest with a favourable season from the gods, bears corn in abundance, whilst good soil, deprived of what it should have received, yields but a poor crop, yet with human kind the worthless is always base, the noble never anything but noble? Is it the parents who make the difference, or the modes of training? ("Hec.," 592 et seq.) And the answer of the ancients was that "Nature is greatest." ("Fr." r2 (Phoenix).) How true the old tale that no good child will ever come from an evil parent. ("Fr." I5 (Dictys).) The opinion that children resemble their parents is oftentimes proved true. ("Fr." I0 (Antig.)) Noble children are born from noble sires, the base are like in nature to their father. ("Fr." 7 (Alcmaeon).) If one were to yoke good with bad, no good offspring would be born; but if both parents are good, they will bear noble children. ("Fr." g (Meleager).) Nevertheless, mortal natures are complex things; a child of no account may be born of a noble sire, and good children from evil parents, ("Elec.," 368.) but no education can transform the bad child of evil stock. ("Fr. Incert.." 38.) The fairest gift that one can give children is to be born of noble parents. ("Herac.," 298.) "I bid all mortals beget well-born children from noble sires." ("Fr." I7 (Antiope).) And the well-born man is the man who is noble in character, not the unjust man, though he be born of a better father than Zeus. ("Fr." II (Dict.))

Nevertheless, it remains a duty to educate one's children well. ("Supp.," 9I7.) Specialized athleticism is as baneful as over-refinement. You cannot fight an enemy with quoits, nor drive them out with the fist. Though war is an evil, military training is an advantage to youth. ("Elec.," 388; "Med.," 295.)

Euripides reflects no less the growing cynicism of the age, abusing women, praising celibacy, denouncing the cares and anxieties of bringing up children. ("Med.," I030; "Alc.," 238, 885 et seq.) There is something, too, of the philosophic egotism of Marcus Aurelius: if you marry, your children may turn out evil; if they are good there is the fear of losing them. (Marc. Aurel., ix. 40; "Fr. (Enom.," 2;

"Fr. Incert.," 963.) But in the " Ion" he speaks with the voice of the old Athenian morality: " I hate the childless, and blame the man to whom such a life seems good." (Eurip., 488; "Ion.")

There is one passage which served as a text for Plutarch's treatise on Education, and might serve no less to-day as a text for Modern Eugenics:

(Greek Unreproducable - ref: Plut., "De Edu.," 2; "H. F.," I264.)

Aristophanes also reflects all the foibles and obsessions of a sceptical age. The existence of Eugenics at Sparta, robbing the theory of something of the revolutionary aspect which it wears to-day, would perhaps have rendered it less a feature for debate than community of wives or women's rights.

Nevertheless, if Eugenics had ever taken a prominent place in Athenian thought, it would have furnished a richer mine of parody than the fantastic obscenity of the Ecclesiazusae. It is commonly held that Socrates suggested all the thought and philosophy of the succeeding centuries. We should expect, therefore, to find some cartography, as it were, of Eugenics paving the way for the fuller imaginings of his pupil Plato. If we regard Xenophon as the only trustworthy source for the oral teachings of Socrates, we may seek in the " Memorabilia" for these earlier adumbrations. (Vide Zeller, "Socrates and his School," p. 100.)

We find the old question of nature and nurture, and with it an attempt to solve the problems of heredity. How is it, asks Hippias, " that parents of good stock do not always produce children as good "? To put the dilemma in a modern form, Why is it that personal value is not necessarily the same as reproductive value ? And the answer which Socrates suggests is an answer which has been given to the same question to-day. Good stock is not everything; both parents must be equally in their prime. ("Mem.," ii. 4.) "The apparent anomalies which children present in not reproducing the qualities of their parents only serve to reveal the presence of particular conditions, and among those

conditions must be included the changes which organism undergoes by reason of advancing age." (Marro, "Influence of Parental Age." Paper read before Eugenics Congress.)

There are other conditions also. Eugenics begins earlier than birth; the unborn child must be protected by bestowing due care on the future mother. A man, says Socrates, has a twofold duty: towards his wife, to cherish her who is to raise up children along with him, and towards children yet unborn, to provide them with things which he thinks will contribute to their well-being. ("Mem.," book 2, chap. ii.) The fatal handicap may have already begun in the starving or overworking of the mother.

But congenital (greek omitted) must be emphasized by education: Socrates is deeply impressed with the evils of its neglect both on the physical and spiritual side. The Athenians, not content with neglecting a good habit, laugh to scorn those who are careful in the matter. When will the Athenians pay strict attention to the body? (iii. 5.) While Euripides denounces the baneful effect of the great athletic festivals, Socrates laments the indifference which could produce an Epigones. (iii.12.)

It is no aesthetic view of morals which makes Socrates insist on the need of physical training: he is concerned rather with the effect of ill-health upon the mind: the reasoning powers suffer atrophy: ill-health may expel all knowledge from a man. (iii. 12.)

There must be moral education no less than physical training. "Corruptio optimi pessima" is the warning of Socrates as well as of Plato. (iv. 2; cf. "Rep.," 497b) The youth with the best natural endowments will, if trained, prove superlatively good. Leave him untrained, and he will become, not merely evil, but degenerate beyond hope of reclaim. The very magnificence of his character makes it impossible to restrain him.

In the Socratic treatment of Eugenic questions there are traces of that individualistic spirit which, neglecting social aspects and regarding only personal consequences, led on in logical succession to abnegation of marriage and

offspring. It is not mere momentary desire, says Socrates, which influences human beings in the production of children; nothing is plainer than the pains we take to seek out wives who shall bear us the finest children. (ii. 2.)

And the penalty for error is the penalty, not of human, but of Divine law. What worse calamity can befall a man than to produce misbegotten children? (iv. 4.) And so with training: because the city has instituted no public military training there is no need to neglect it in private. (iii. 12.) No demonstration of a self-incurred penalty is likely to appeal to the degenerate or feeble-minded.

Xenophon was a man of timid and commonplace mind, and reported nothing he could not comprehend. We may suspect from Plato that much of the Socratic teaching has been lost, but if there had been any fuller systematization of Eugenics, it is improbable that the Philo-Laconist Xenophon would have failed to leave a record.

Critias, the pupil of Socrates, seems to have advocated something like a Spartan system of Eugenics. "I begin with man's birth, showing how he may become best and strongest in body, if the father trains and undergoes hardship, and the future mother is strong and also trains." ("Krit. Muller. Fr. Hist. Gk.," ii. 68.) But a complete development along Spartan lines begins with Plato, and Socrates led not only to Plato, but to Cynic and Cyrenaic individualism.

Nevertheless, the incivism of the Cynic, bringing with it the belief in a self-centred and isolated self, never involved, like the later asceticism, the entire uprooting of all sexual desire. The wise man will marry for the sake of children, associating with the most comely. (Diog., ii.) Antisthenes employed analogy from animal life, but it served only to point the cry of abandonment of cities and civilization, and return to the simple and primitive. The Cyrenaic no less is (greek omitted), and equally an egotist; but complete negation of social duties and actualization of despair was only possible when Greece had lost for ever the ideal of the city state.

Sparta conceived the first system of practical Eugenics; the

first formulation in theory belongs to Plato. Archytas of Tarentum, Phaleas of Chalcedon, and Hippodamus, the Hausman of the Piraeus, may have anticipated the Platonic communism: the Platonic Eugenics is based on no Utopia, but on a living and successful community. The scheme of the Republic, though it owes a little to contemporary thought, something also to contemporary science, is most of all a speculative development of the Spartan system. In this respect one cannot speak of the Platonic Republic as the perfection of the laws of Lycurgus; (Montesq., "Esprit des Lois," vii. 16.) nor can it be truly said that if Lycurgus had only put his scheme in writing, it would have appeared far more chimerical than the Platonic. (Rousseau, "Emile," I.)

On the negative side there is infanticide, and approval of the practice of destroying life in the germ. As in that other question of slavery, there are signs that Plato, from his speculative Pisgah, had glimpses of a higher humanity. But he succeeded only in formulating an ineffectual compromise which retained the same evils under another name. Concealment of the newborn child " in an unknown and mysterious hiding-place" is still infanticide.

In an earlier passage copper may rise to silver, silver to gold, and the copper-child of golden parents may be degraded to its own class. ("Rep.," 423) This is a higher ideal than that of Aristotle, whose slave, the hopeless product of heredity, can never shake himself free from the trammels of his birth. So to-day Eugenists have recognized that in the mass of men belonging to the superior class one finds a small number of men with inferior qualities, while in the mass of men forming the inferior classes one finds a certain number of men with superior characters. It is suggested that between these two exceptional categories social exchanges should be made, allowing the best of the lower stratum to ascend, compelling the unadapted who are found above to descend to their own level. (Cf. Professor Niceforo, "Causes of Mental and Physical Characters in Lower Classes." Paper read before Eugenics Congress.)

But the Platonic dialogues, and on a higher scale the concise lecture notes of Aristotle, are not the mere exfoliation of a finished product of thought, but a gradual

development. One idea devours another; there is thesis and antithesis, and the final synthesis, if achieved at all, is found at the end and not at the beginning. When Plato came to formulate a positive scheme of Eugenics, his Spartan model seemed to show him that infanticide in some form was inevitable, when there was no knowledge to control the vagaries of nature. It was the ancient solution of the problem of heredity, and is still the solution of the breeder who "breeds a great many and kills a great many." So the issue of inferior parents and defective children born of good stock are to be "hidden away." Concealment is the Platonic euphemism for infanticide. Men and women, past the proscribed age, are to do their best to prevent any offspring from seeing the light: if they fail, they are to dispose of their issue on the understanding that it is not to be reared. (1 "Rep.," 461c.)

Plato's critics from the days of Aristotle have concerned themselves with the position of his third class, but in no long period of time this class would have suffered total extinction. Plato solved one problem to raise another. Like the primitive tribes, who, slaughtering every child that was born, were compelled to steal the children of their enemies, Plato, by eliminating the offspring of the lower class, would have forced his guardians to steal the* men of copper from their foes. A community needs its lower classes, just as the body needs its humbler organs: subordinate to all, these men of copper are yet the most necessary of all. In his anxiety to breed a race of Eugenes, Plato removed the conditions which made their existence possible. While the children of the lower classes are to be eliminated at birth, nature would have eliminated the children of the upper classes. Plato's pens would have been as fatal as the creches of Paris or the Foundling Hospital of Dublin.

Besides infanticide there are other methods for dealing with certain types of the unfit. The Platonic theory of medicine is a recurrence to the practice of the primitive savage, who, under pressure of want or war, abandoned the aged and infirm, and left them to die of exposure or starvation. Plato would leave the valetudinarian to die because he is incapacitated from fulfilling his appointed task, and will beget children in all probability as diseased as himself if

his miserable existence is protracted by the physician's skill. ("Rep.," 407.)

Herodicus is useless both to himself and to the state, for chronic ill-health, as Socrates taught, reacts upon the mind. It is no part of the physician's task to " pamper a luxurious valetudinarianism": the art of Asclepius is only for those who are suffering from a specific complaint. So the chronic invalid will be left to die, even if he be richer than Midas.

There are two types whom Plato would condemn to natural elimination—the victims of constitutional ill-health, and the victims of self-indulgence. (Ibid., 408.) Refused medical aid, they are allowed to linger on, but there is no hint of segregation or custodial care to exclude them from parenthood. Under the later Eugenic scheme it is clear that the offspring of any such unions would have been ruthlessly exterminated: there was no place in the Platonic Republic for the " unkempt " man, glorying in a pedigree of congenital ailment. (Theophrastus, I9) To-day the limitations of our knowledge render restrictive measures possible only in the case of the feeble-minded.

But apart from the physical degenerate, there is the moral degenerate, no mere encumbrance to society, but an active force for evil. No law of nature operates for his elimination; therefore, like the lower desires of the soul which cannot be tamed to service under the higher self, his growth must be stopped. Society has no course but to put him out of the way. ("Rep.," 410a.) The modern treatment of the morally incurable is humaner than the Platonic, yet lacking in humanity. We pity degeneracy when it takes the form of disease, but when it takes the form of immorality or crime we blame and we punish. The habitual criminal is no less a victim of heredity than the prisoner in Erewhon, " convicted of the great crime of labouring under pulmonary consumption." (Samuel Butler, "Erewhon," p. 72. Cf. Bateson, "Biological Fact and Structure of Society," p. I9.)

Plato bases his constructive scheme on that analogy of the breeder which has formed the premisses, latent or confessed, for all Constructive Eugenics from the days of Lycurgus. "

What very first-rate men our rulers ought to be," says Socrates, " if the analogy of animal holds good with regard to the human race!" Glaucon, accepting the analogy literally and without limitation, justifies the harshest strictures that have been levelled against any such conception of Eugenics. ("Rep.," 459.) In the Platonic Republic, though not in Sparta, there is a race of supermen, the breeders of the human kingdom, arbitrarily interfering with natural instinct in order to produce a noble stock. Plato, recognizing that even in Greece there were limits set to the sphere of the legislator, and unable to appeal to the cogency of assured knowledge to support his philosophic imperatives, resorts instead to childish subterfuge, '¢ an ingenious system of lots."

But compulsion, or guidance, however veiled, is foredoomed to failure in the case of an institution which can only rest on inclination or an innate sense of duty. Moreover, " custom is lord of all," and custom can only be modified gradually and in the course of centuries: it is only the thinnest surface layer with which the legislator can tamper. No social reform or political progress can be effected by the arbitrary creation of institutions to which there are no answering ideas: external coercion with no correspondent reaction can achieve no permanent good. The basis of law is subjective. Modern Eugenists have recognized that, if there is to be Eugenics by Act of Parliament, the Eugenic ideal must first be absorbed into the conscience of the nation.

The Spartan system of " compliances " is developed into a system of temporary marriages instead of the polygamy of the Germans. The best of both sexes are to be brought together as often as possible, and the worst as seldom as possible. Greater liberty is to be allowed to the brave warrior, but a liberty within restricted limits, and the concession is not for the sake of the individual, but for the good of the state. Plato is the slave of his analogy.

As at Sparta, there is regulation of the marriage age, a commonplace of contemporary thought, and therefore an inevitable feature of any Eugenic system. The parents must be in their prime of life: this period is defined as twenty years in a woman, thirty in a man. A woman may bear children

to the state till she is forty; a man beginning at twenty-five, when he has passed " the first sharp burst of life," may continue to beget children until he is fifty-five. For both in man and woman these years are the prime of physical as well as of intellectual vigour. In Sparta we hear of no definite regulation concerning those who have passed their prime, beyond exclusion from child-bearing. Plato's treatment of the problem is " the only point in this part of the Republic which is in any sense immoral, and a point upon which modern ethics may well censure the highest Greek morals." (Mahaffy, "History of Greek Literature," vol. ii., part 1, 200)

As to that second problem, the selection of qualities to breed in, Plato, like Sparta, chose physique, but chose it because he believed that soul depends on body, matter conditions mind. There is no fairer spectacle than that of a man who combines beauty of soul and beauty of form. ("Rep.," 402.) Physical and intellectual vigour ripen simultaneously. Modern Eugenists no less hold it a legitimate working hypothesis that the vehicle of mental inheritance is at bottom material. (Eugenics Review, July, 1912; Cyril Burt, "Inheritance of Mental Characters.") There is a further requirement that parents should as far as possible be of similar nature.

There is no mention in the Republic of that care for the future mother which was a feature of the Spartan system. But there is a twofold scheme of education adapted for the development of other qualities than the merely physical, the first an (greek omitted) diverging little from the customary education of the day, and then that second formulation which was to culminate in the knowledge of the good itself. Once he had shaken himself free from the military ideals of Sparta, Plato, concerned no longer to write a tract for the times, ends by building an ideal city where only gods or sons of gods could live.

In this scheme of education it is recognized that environment no less than heredity plays a part in the development of the individual. The banks of the stream must be cleansed as well as its source. Good environment, (Greek Ommitted), is the keystone of the Platonic system; its

essence is "nurture." The young citizen is like an animal at pasture; from the things all about him he assimilates good and evil, and what he gathers from his environment becomes embodied in his character. A gifted soul in vitiated surroundings is like a rare exotic sown in unfavourable soil; gradually losing its true nature, it sinks at last to the level of its surroundings. But after all "Nature is greatest." There are lower desires which no good influence can ever spiritualize. Education can only turn to the light the intrinsic capacities of the soul.

The relative influence of these two factors has been expressed in much the same terms to-day. Men have a considerable capacity for being moulded by environment, no small susceptibility to the influences of education and early training. But these influences operate in a circumscribed sphere. There is in the brain at birth a proclivity towards certain directions rather than others: to this original inherited capacity environment can add nothing: it can only develop or frustrate it. The Socialist who contends that all men should and might be made equal would find no friend in Plato any more than in modern Eugenists.

Finally, there is the question of the regulation of the numbers of the state "to prevent it becoming too great or too small." ("Rep.," 423c.) The Spartan problem was preservation of numbers; the problem of the Republic would have centred about this same aspect in an even greater degree. In a state where the best children were foundlings and the rest were eliminated at birth, the infantile death-rate would have more than counterbalanced any rise in the birth-rate. Moreover, among the adult population there are other factors working for elimination— "wars and diseases and any similar agencies." Military selection is essentially anti-eugenic: not only does it extinguish the best elements of the state, but it removes from the reproducing part of the population large numbers of the selected. Disease, though more the resultant of the crowded conditions following on modern urbanization, found its hecatomb of victims even in ancient times. Plato, aware of the ruthless waste of life which attends on Nature's process of elimination, was blind to the tendencies of his own

short-sighted scheme.

Obsessed by the idea of the mean and a mystic doctrine of numbers, he would fix the number of the state at an unalterable 8,000. To attain this static equilibrium the guardians are to regulate the number of marriages. ("Rep.," 460.) The elimination of the lower class by infanticide saved Plato from the needs of a (Greek omitted), but the alien is neither expelled nor encouraged; his existence is forgotten. There is little doubt that in no long period of time the Platonic guardians would have been faced with the grave problem of depopulation.

It is recognized to-day that it should be the endeavour of social organization to secure the " optimum" number, and not the maximum number. " To spread a layer of human protoplasm of the greatest thickness over the earth--the implied ambition of many publicists--in the light of natural knowledge is seen to be reckless folly." (Bateson, "Biological Fact and Structure of Society," p. 21) But there is a natural tendency which limits the numbers of the population to the energy-income of the earth. Among the intelligent classes of a civilized community it is effected by control of reproduction; among the lower classes the same equilibrium is brought about by a differential death-rate. The Platonic aim was justified biologically as well as from the economic point of view, but his methods were mistaken.

Legislation would have failed in the Republic as it failed in Sparta and Imperial Rome.

Selfish and parochial as the Spartan, the Platonic Eugenics is more an academic dream than a practical method of amelioration. Yet it was an essential step towards progress when Eugenics, divorced from militarism, found a place for the intellect of the philosopher King beside the physique of the warrior.

From the Republic we pass to the " Politicus." A work intended as a " metaphysical exercise in the art of differentiations has merely a parenthetical concern with Eugenics. We find, however, a brief and fantastic adumbration of a constructive scheme.

In the Republic selection was on the basis of physique and similarity of character; in the Politicus Plato's aim is the fusion of contrasted temperaments. Rightly recognizing that the law of sexual attraction is "like to like," ("Polit.," 310. Cf. Havelock Ellis, "Studies in Psychology of Sex," vol. iv.) he would yet set himself in opposition to the simple psychology of the lover.

In the Protagoras Socrates had maintained that there was only one virtue; in the Politicus Plato asserts not only a partial opposition between distinct virtues, but a similar opposition pervading art and nature. It is the royal art to weave a state of one texture out of the warp and woof of human society. Courage wed to courage through many generations culminates in insanity: the soul full of an excessive modesty mated to a similar soul becomes in the end useless and paralyzed. Therefore opposite must be wed to opposite, so as to effect a fusion of characters in the child. Content to lay down principles, Plato makes no mention of the means by which he would achieve his end.

The Platonic hypothesis of fusion finds no verification in Mendelism. The most noticeable point in human inheritance is the frequency with which children resemble one parent to the apparent exclusion of the other. The phenomena of "coupling" and "repulsion," of dominant and recessive characters, under the present limitations of our knowledge, render impossible, even if desirable, any attempt to interlace the warp and woof of society more Platonico. The well-attested fact of dichotomy in human inheritance would effect the complete reversal of Plato's aim.

From the fantastic laconism of the Republic and the visionary parenthesis of the Politicus we pass to the palinode of disillusioned senility, the Laws. Like Lear, Plato has brought up ungrateful children, and they have turned against him. An Athenian ideal supersedes the Spartan; he would show that his principles are perfectly consonant even with Athenian ideas; he would modify them till they came within the scope of practical action, building a "City of Cecrops" in place of his "City of God."

Yet in the background there are still traces of his old ideal. As in the *Politicus*, the aim of marriage is to be the combination of opposites. "Children," says Apuleius, "are to be conceived in the seed-bed of dissimilar manners." The headstrong must mate with the prudent, and the prudent with the headstrong, tempering their natures as wine is tempered by water. ("Laws," 773d) But not only is there to be a fusion of characters, there is to be a combination also of status and income: the rich must not marry the rich, nor the powerful the powerful. This triple basis of selection, with the infinite perplexities it involves, is the *reductio ad absurdum* of the Platonic thesis of fusion.

Modern Eugenists, faced with the difficulties of selection, have attempted to infer the aptitude of individuals from their social and economic position. This would be a question of acting, so that marriages would be effected predominantly amongst the wealthy and prevented as far as possible among the poor. (Cf. Achille Loria, "Psychophysical and Economic Elite." Paper read before Eugenics Congress.) But Plato was not concerned with the relation between the economic and psychophysical elite, or with proving that the former were the product of the latter. On the contrary, obsessed by the idea of harmony, he would wed the rich to the poor, the poor to the rich.

The Platonic conception of marriage implies an irrational universe. Personal inclination is to be sacrificed on the altar of political expediency. Nevertheless, Plato recognized the power of the "myriad voices" of opinion. "In the case of marriages, births, and patrimonies he swerves from the rules laid down for the former commonwealth by making marriages an affair of individuals, and the business of the suitors themselves private." ("Apul. Dogmata Platonis.") He realizes that legal compulsion in such matters would arouse anger and ridicule. Therefore, like modern Eugenists, he would trust to the power of public opinion.

The state is to be monogamous, and, as in Sparta and the Republic, there is regulation of the marriage age. A woman is to marry between the ages of sixteen and twenty, a man not earlier than twenty-five ("Laws," 772d) or thirty,

(Ibid., 721a, 785b.) and not later than thirty-five. The period of child-bearing is to last for ten years; at the end of that period, if there are no children and the parents are free from censure, honourable divorce is to be conceded.

As at Sparta, there is to be care for the future child, set on a wider basis of science. There are times when incontinence, ill-health, moral delinquency of any kind leave their impress upon the mind or body of the offspring. Parents must bear in mind that they are handing down the torch of life to future generations. (Ibid., 776b.)

Eugenics is being studied from the point of view of medical science. Already in the Republic Plato had owed something to the teaching of Hippocrates, (Galen., p. 875) and in this discussion of prenatal influences we may trace a further debt. "To form a child from birth to the best constitution, first of all care must be taken of the seed itself, then of food) drink, exercise, quiet, sleep, desires, and other things, all of which Plato has carefully studied." (Galen., "Hippoc. et Plat.," p. 465)

The Modern Eugenist in such "dysgenic" influences as alcoholism finds an explanation of the apparent anomalies of heredity. All forms of degradation, physical, intellectual, moral, fall upon the degenerates who are the offspring of such parents. (Magnan and Filassier, "Alcoholism and Degeneracy." Paper read before Eugenics Congress.) But such a system of espionage as Plato proposes is entirely repugnant to modern ideas. For the first ten years of married life the parents are subject to continual supervision. ("Laws," 784b) Inquisitorial methods can only achieve negative results.

The educational scheme of the Laws is a very different thing from that of the Republic. Pitched at a level which makes it possible for all, it leads to no final knowledge of the good. There are Public Infant Schools, but education is to cease after the age of six. Besides gymnastic and music, there is some training in the sciences, but the ideal is Pythagorean rather than Platonic.

Modern Eugenists lay less stress on training, not because

their knowledge of heredity is greater, but because modern conditions curtail the opportunities of the educationist. The citizen of the Republic and the Laws had no need of "bread-studies."

No less than in the Republic Plato recognizes that education by itself cannot achieve everything. Men well educated become good men: without gymnastic and other education neither soul nor body will ever be of much account. ("Laws," 641c, 766a.) But a fortunate nature is as necessary as a good education, and those of the Athenians who become good men become good without constraint by their own natures. Only a few can achieve perfect happiness, and these are they who divine and temperate, and gifted with all other virtues by nature, have also received everything which good education could impart. (Ibid., 642d, 992d.)

In addition to education and heredity, Plato, influenced, perhaps, by the treatise of Hippocrates, recognizes the influence of material environment. There is a difference in places, and some beget better men and others worse. Some places are subject to strange and fatal influences by reason of diverse winds and violent heats or the character of the waters. Again, there is the character of the food supplied by the earth, which not only affects the bodies of men for good or evil, but produces the same result on their souls. But geographic environment cannot produce a given type of mind any more than education: it can only foster or thwart heredity. It merely determines what shall actually be by selective destruction of the incompatible.

As to the negative aspect of this scheme, Plato would segregate the madman and expel the pauper. The madman is not to be seen in the city, but the responsibility rests upon the relatives, not upon the state. If they fail in their duty, the law will punish them. The treatment of the insane was a difficult problem in an age when there were no asylums.

There is another problem, also, which has assumed far larger proportions to-day owing to the growth of humanitarian sentiment and the enormous numbers of the modern state. Plato has a simple and ruthless way with the pauper. In a

properly constituted state the righteous man will not be allowed to starve: there is no excuse for the beggar. " If such a one be found, he shall be driven out of the market-place, out of the city, out of the land, that the state may be purged of such a creature. ("Laws," 936c.) When a city is small, there is no difficulty in maintaining the poor; such a prohibition might have been enforced without difficulty in an ancient state. We may approve of the simple thoroughness of the Platonic method, but the complexity of modern conditions has rendered its adoption impossible.

In the eyes of the Socialist unemployed and unemployable alike are the victims of the social system: to the Eugenist, the chronic pauper is the victim of the germ-plasm-heredity. With increased knowledge to justify restrictions, the modern state may be purged of the pauper more slowly, but no less surely, than the Platonic state of the Laws.

Plato, moreover, recognized bodily or mental defects as a bar to marriage, though not viewing the question from its Eugenic aspect. He is concerned with the parents, and not with the children. The law does not forbid marriage with an orphan who is suffering from some defect; it merely refrains from compulsion. Modern Eugenists, concerned with classifying such defects into transmissible and non-transmissible, regard the question from a different view-point. In the matter of inspection to decide the fitness of age for marriage there is something of the idea which came to life again in More's "Utopia " and Campanella's "City of the Sun." ("Laws," 925 e and b.)

Finally, there is the question of the numbers of the population. It is no definitely Eugenic conception that leads to the limitation of 5,040: there is a certain Malthusian element, and something of a prepossession with a mystical doctrine of numbers. " The means of regulation are many," but the means of the humaner Laws are not those of the Republic. In the case of an excessive population the fertile may be made to refrain, or, as a last resort, there is " that old device," the colony. Faced with the opposite extreme, the rulers will resort to rewards, stigmas, and advice; but if disease or war bring devastation, no course lies open except to introduce citizens from without.

("Laws," 741.) Births and deaths must be registered, in order to make it possible to check the numbers of the population. There is no (greek omitted), no (greek omitted) , no infanticide, though it seems that Plato would concede the practice of destroying life in the germ. It is only in the case of some such cataclysm as Plato anticipated that legislative interference with questions of quantity is justified.

Even in this endeavour to sacrifice ideals to possibilities there is still the a-priorism of the visionary. There is more humanity, more concession to the infirmities of human nature, but little that comes within the scope of practical action. Neither the legislation of the Republic nor the precepts of the Laws could have ever realized the Platonic dream of Eugenics.

From Plato we pass to Aristotle and the culminating period in the history of Ancient Eugenics. The Aristotelian scheme is almost entirely negative and restrictive. There is infanticide, but infanticide in its last phase, exposure of the imperfect and maimed, and, in the case of superfluous children, destruction of life in the germ. There is no fantastical scheme for the fusion of parental temperament, no rigid selection on the sole basis of physique.

Like Plato, Aristotle believed in the intimate relationship between psychological phenomena and physical conditions. ("De Anim.," 402b, 8.) Body stands to soul in the relation of matter to form, potentiality to actuality; soul is the entelechy of the body. (Ibid., ii. I, 412a, 28.) Body being prior chronologically to soul, demands attention first, but only for the sake of the soul. ("Pol.," 1334b.) Care, therefore, must be taken that the bodies of the children may answer the expectations of the legislator.

There is no need for a man to possess the physique of a wrestler in order to be the father of healthy children; neither must he be a valetudinarian nor physically degenerate. There is a via media between the extremes of specialized athleticism and physical incapacity, and it is this mean which is the desirable condition for both men and women. The valetudinarian who would have been left to die in

the Republic may one day be eliminated by the humaner methods of Aristotle. There is much evidence to prove that physical weakness is a case of simple Mendelian transmission.

As at Sparta and in the states of the Republic and Laws, there is limitation of the marriage age. Aristotle recommends the difference of twenty years between the ages of husband and wife, or, more accurately, the difference between thirty-seven and eighteen. Comparison with the marriage age defined in the Republic and Laws shows that ancient thought had decreed no definite period. Four reasons incline Aristotle to select these ages. Since the procreative power of women stops at fifty, the harmony of the union will be preserved by insuring that husband and wife shall grow old at the same period of time. The disadvantages which attend too great nearness or distance in age between father and child are also avoided. More important than all, these ages, consulting the physical wellbeing of husband and wife, afford the best prospect of well-developed children.

It is possible to approve of the postponement of marriage till eighteen, or even later; but the disparity of ages seems unnecessarily great. Aristotle, studying the results of early marriage in other cities, deplored its baneful effect on physique. Modern Eugenists point no less to the effect on the moral character of the offspring.

Like Sparta and Plato, Aristotle forbade those past their prime to rear children to the state. Marriage is thus divided into two periods, and this first period is to last for seventeen years, not ten as in the Laws. Moreover, he would fix even the season for contracting marriage, and in conformity with Pythagoras and Greek custom generally, chooses Gamelion. To-day it is held that neither the vitality of the offspring, their physique, nor their intellectual capacity, show any clear correlation with the season of birth. " There is no atavistic heritage of a special season for reproduction which the human race have originally shown analogous to what one finds to-day in many species of animals." (Gini, "Demographic Contributions to the Problems of Eugenics." Paper read before Eugenics

Congress.) "The married couple ought also to regard the precepts of physicians and naturalists." Aristotle, belonging to an Asclepiad family, received the partly medical education which was traditional in such families. Some of his encyclopaedic writings deal with medical subjects, and he is said to have practised medicine as an amateur. This is a further stage of the tendency which had begun with Plato's debt to Hippocrates.

Care for the child is to begin before the cradle. And Aristotle insists, like the Spartan legislator, on the avoidance of sedentary occupation and the need for a proper dietary. But he is concerned not only with effect on physique, but also, like Plato, with effect on the mind.

The first seven years of a child's life are to be spent at home, not in the creches of the Republic, nor in the public infant schools of Plato's Laws. This is to be a time of games, "mimicries of future earnest," under the charge of the inspectors of children, for Aristotle held with Plato that the majority of our likes and dislikes are formed in these early ages. Education is to run in cycles of seven years; the child is to be controlled at every period of its evolution. From the age of seven to puberty there are state-controlled gymnastics, but these gymnastics, unlike the Spartan, are merely a means to a further end the training of reason from puberty to the age of twenty-one. After this education ceases, and the young man brings body and mind, fully developed, to the service of the state. Aristotle's scheme is merely adumbrated: there are scattered suggestions rather than coordination, and the last stage of science, which is to cultivate the reason, is never mentioned at all.

Aristotle, like the Ancients generally, recognizes the importance of both environment and heredity. There are three stages in the formation of character, nature, custom, reason: innate potentiality, environment, self-direction by the light of a principle. We are born good, we have goodness thrust upon us, we achieve goodness. Heredity to Aristotle explains the slave just as certainly as it explains those who never will be slaves; yet to admit emancipation for all slaves is to confess that there is no slave by nature

without the potentialities of full manhood. It is true that some men from the beginning are fit only for that lower work on which the fabric of society must rest. The maintenance of heterogeneity is an essential condition of progress: there must always be the minuti homines at the base of things, though we have long since passed from the permanent grades of Plato, Aristotle, and the Middle Ages. Plato, indeed, at one period seems to have conceded that the man from the copper class might rise to the silver or gold, and it is at this that social reform must aim, not to abolish class, but to provide that each individual shall, as far as possible, reach his proper stratum and remain in it. (Cf. Bateson, "Biological Fact and Structure of Society," p. 33.)

Like Plato, Aristotle recognizes that there are victims of heredity who can never be made good by education. ("Pol.," 1316a.) But this factor of heredity is amenable to no certain control. Helen may boast of her immortal lineage, but those who think it reasonable that as a man begets a man and a beast a beast, so from a good man a good man should be descended, these fail to see that, though such is the desire of nature, her failures are frequent. (Ibid., 1255b) Nature's aim is perfection, to make this the best of all possible worlds; but there are failures because matter is not always congruous with form. ("De Cael.," 271a, 33; "Gen. An.," iv. 4, 770b, 16.) But "Nature's defects are man's opportunities": matter must therefore be helped as far as possible to the realization of its true form by the human agency of education.

So much importance did Aristotle attach to education that, like Sparta, he would make it entirely an affair of the state. There is to be one educational authority and one sole system of education.

The laws of Aristotle are as catholic as the laws of Alfred: "the legislator must extend his views to everything." ("Pol.," 1333a) Therefore his Eugenic scheme will be enforced by law. His aim is to embody public opinion in law, not to educate opinion to such a point that law will become unnecessary.

"Every city is constituted of quantity and quality."

(1296b.) Aristotle, therefore, no less than Plato, would fix an ideal limit to the population as well as regulate its quality. In the Aristotelian scheme, as in the Platonic, there emerges a certain Malthusian element; but it is a legal ordinance and not a natural law: it is to prevent population from interfering with the equalization of lots, not from outrunning the limits of subsistence. He conceived that Plato's plan of unigeniture made it more than ever essential that there should not be too many sons in a household, and yet, in his view, the Platonic means were insufficient. But there is also the conception of the mean, of an enclosing limit or (greek omitted), flowing naturally from the teleological method. Just as a boat can no more be two furlongs long than a span long, so a state can no more have 100,000 citizens than ten. ("Eth.," 9, 10, 3) Its essence lies in the fact that it can easily be comprehended as a whole.

Yet, though Aristotle held the State to be a natural organism, he would not concede that hypertrophy was prevented by natural laws without the need for human co-operation. It is absurd to leave numbers to regulate themselves, according to the number of women who should happen to be childless, because this seems to occur in other cities. (1265b.) Rejecting as a mere palliative the remedy of colonization, which Pheidon of Corinth had suggested, and Plato had kept in the background of the Laws, he insisted that a limit must be set to the procreation of children, even during a seventeen years' term. When infractions occurred- and one would imagine that under such circumstances they would be of frequent occurrence there is not to be exposure, which is impious on the ground of superfluity, but destruction of life in the germ.

Today limitation of numbers among the upper classes of the community is being brought about naturally by the increase of foresight and self-control. It is the lower classes whose reckless propagation constitutes the problem of Modern Eugenics. Aristotle, denying these classes the rights of citizenship, and treating them politically as cyphers, sets them outside his scheme of social reform. The number of slaves, resident aliens, and foreigners, is to be left to chance, "and it is perhaps necessary that their numbers

should be large."

The Aristotelian Eugenics, therefore, are as selfish and parochial as the Spartan. As in the animal body, the homogeneous are for the sake of the heterogeneous. (Arist., "Part. An.," ii. I.) Where Eugenics is most necessary, Eugenics is denied; the man who performs a task which ruins his body or his mind is set beyond the pale as a mere living instrument. This was the simple pre-humanitarian solution of a difficult problem. But Aristotle recognized, as Eugenists recognize to-day, that any scheme of constructive Eugenics must be set aside as visionary and im-practicable (Bateson, "Biological Fact and Structure of Society," p. 12.) so slender is our knowledge of the genetic processes of man. Aristotle, finding a scapegoat in a mythological nature, abandoned the problem as insoluble: to-day we are still seeking some outline of an analysis of human characters.

The chief interest of the Aristotelian Eugenics lies in the fact that he set out to construct a scheme which should be practicable for Athens, no academic speculation in the clouds, but a possible plan of social reform. " The legislator must bear two things in mind—what is possible and what is proper. It is not enough to perceive what is best without being able to put it in practiced." (1289a) Hence careful attention is paid to popular opinion and existing custom. The consensus mundi, the collective capacity of the many, are factors the importance of which he constantly emphasizes. This " divine right of things as they are," involving a certain conservatism, led him to uphold any custom revealing after analysis a balance of good in its favour. Hence the acceptance of infanticide and slavery, and regulation of the marriage age. The doctrine of the mean also, which helped to decide the proper disposition of parents and to fix the number of the state, was an essential article of received opinion. If Athens had ever instituted a Eugenic system, it would have been the system of Aristotle, not of Sparta or Plato.

Aristotle, applying the idea of development to knowledge as well as to the objects of knowledge, not only conceived his own theories as a development of those of his predecessors, but imagined himself as standing at the culmination of Greek

thought. This eschatology was justified. The Politics not only set the final seal upon political science in Greece} it marks also the last word in Eugenics.

Looking back upon these past systems, we find that the task was easier for a pre-Christian age which could sacrifice the lower classes in the interests of the higher and solve the problems of heredity by infanticide. Even when the influence of Sparta had died away and Eugenics was regarded no longer as a mere ancillary to war, parochialism confined it to a single state, inhumanity to a single class. The features which are so prominent in all these early schemes precise limitation of the marriage age and detailed schemes of educationÑare features which, though still recognized) no longer have their place in the foreground of modern thought.

The Greeks were concerned more with the banks of the stream; the modern aim is to control its source. The gradual process of social reform during the first three quarters of the nineteenth century has gradually brought us farther back in the course of successive stages. From measures of sanitation and factory laws we have passed to national schemes of education. A gradual extension of aim has led to efforts to guard the child at birth, even before birth; and, finally, Eugenics has set itself to solve the problems of heredity. The " Life-History Albums " of Galton would trace the workings of the ancestral curse, the Ate of inherited disease as well as of inherited sin: Mendelism would render possible a factorial analysis of the individual.

Nevertheless, though the Greeks abandoned the question of heredity in despair, and, unable to prevent its victims being born, slew them if possible at birth, they realized many of the problems which, 2,000 years later, are still confronting Eugenists, and they realized in part the remedies. It is wrong to say that antiquity never raised the question as to whether a hereditary disease or predisposition to disease should be a bar to marriage. The Spartans, Plato, Aristotle, all realized the problem, Plato returning to atavism for his remedy, Aristotle conceiving the humaner methods of Modern Eugenists. Sparta and Plato, too, were not blind to the need, to-day so urgent, of restrictive measures dealing with the insane, and Plato even

dreamt of segregation. There is the recognition, also, that Eugenics is the sphere of the physician as well as of the philosopher; that quantity is a factor in the problem as well as quality; that selective Eugenics must regard the psychical as well as the physical. But even that final formulation in the pages of Aristotle, which would have been possible to the age, and more possible to-day than the narrow scheme of Sparta or the unsubstantial visions of Plato, even these saner Eugenics have in them much that is impossible, no little that is abhorrent, to thinkers of to-day. But the idea had been given life and brought to bear. Long after the sowers had passed away it sprang to renewed existence in a different age and in a different form, engendered by new conditions.

After Aristotle stretches a gulf of years in which Eugenics lies amid the lumber of forgotten theory. The state education of the fourth century may have owed something to Plato and Aristotle, but there is no state control of marriage. Zeno and Chrysippus, influenced, perhaps, by a perverted Platonism, advocated community of wives. But Zeno taught that the intelligent man should avoid all public affairs except in a state approaching perfection; and Chrysippus, writing a treatise on the education of childhood, is reproached by Poseidonius for neglecting its first and most important stages, especially those before birth. "Poseidonius blames Chrysippus and admires what Plato taught about the formation of children while yet unborn." (Galen., "Hipp. et Plat.," v. i., p. 465.)

No attempt was ever made to realize the ideals of the Republic "except by dreamers and somnambulists at second-hand in an age of mysticism and social degeneration." Plotinus obtained from the Emperor Gallienus and his wife the concession of a ruined city in Campania, which had once been founded by philosophers. He proposed to restore it, name it Platonopolis, and adopt the laws of Plato. (Porphyry, "Plotinus," c. 12.) This early anticipation of the Oneida Community never seems to have been realized.

In the "Utopia" of Sir Thomas More the marriage preliminaries, suggesting something of Plato's physical point of view, recall a passage in the Laws. But in

Campanella's "City of the Sun " we find a closer approximation to the Platonic Eugenics.

Marriage, recognized as an affair of the state rather than of the individual, because the interests of future generations are involved, is only to be performed in the light of scientific knowledge. The " great master," who is a physician, aided by the chief matrons, is to supervise marriage, which will be confined to the valorous and high-spirited. There is to be a system of state education, and the women are trained for the most part like men in warlike and other exercises. Campanella has been called the prophet of Modern Eugenics: he is the connecting-link between the crude Eugenics of the past and the scientific Eugenics of Galton.

There is one brief attempt at practical Eugenics, the Oneida Community of Noyes, which, outrunning scientific knowledge and the ideas of the day, raised the bitter antagonism of a public not yet fitted to receive it. Two thousand years after Aristotle Galton formulated the first scientific scheme of Eugenics.

This sudden arrest of the developing Eugenic ideal after Aristotle is not difficult of explanation. Realizing only vaguely the difficulties with which modern science has encompassed the problem, the Ancients might have been expected to have cherished the ideal till actual experiment revealed these incommensurable factors. With their conception of the state (greek omitted) with their recognition of law as the sum of the spiritual limits of the people, with the favourable support of the consensus mundi, which Aristotle never opposed, everything seemed opportune for its realization.

But just as a good man is crushed by a bad environment, so a social theory must wither in an unresponsive age. Eugenics is dependent upon the ethical perspective; the philosophy of egotism --le culte de soi-eme- finds no appeal in a theory which looks beyond the pleasure of the individual to the interests of the future race.

From Socrates to Aristotle philosophy has striven to stem

the current of political dissolution, and in philosophy we see an insurgent pessimism, an ever-growing prominence assigned to the theoretic life. The supremacy of Macedon signaled the final breakdown of Greek civilization. Aristotle, standing on the border-line, found in classic antiquity an influence sufficiently strong to place the community in the foreground as compared with the individual.

After Aristotle, the tendency which had already been at work among the philosophers of the Academy and the Peripatetics completely reversed the position. Turning aside from the ideal of man as an organic member of society, philosophy concerned itself instead with the satisfaction of the ideas of the individual.

In place of their old dead principles men required new guides: they sought and found in two directions—Orientalism and philosophy. From Orientalism they learnt to profess complete detachment from an ephemeral world of sordid corporeal change, to contemn women and offspring, to throw aside costume, cleanliness, and all the customary decencies of life: Karma will soon be exhausted, Nirvana attained. No theory of racial regeneration can flourish in such an atmosphere of inconsequent egotism.

Epicureanism, with its watchword of "seclusion," teaching its disciples to forego marriage and the rearing of children, can have had no place for Eugenics. Equally opposed is the tendency of Stoicism, which "draws such a sharp distinction between what is without and what is within that it regards the latter as alone essential, the former as altogether indifferent, which attaches no value to anything except virtuous intention, and places the highest value in being independent of everything." (Zeller, "Stoics and Epicureans," p. 310.)

Such a system is not likely to concern itself with the interests of a state in which the mass of men are fools, and denied every healthy endeavour. It is true that besides this tendency toward individual independence there was a logical development of Stoicism which recognized that man, to obtain his freedom, must live, not for himself, but for society. (Cic., "Fin.," iii. 19, 64; Sen., "Ep.," 95, 52 ("membra

sumus corporis magni").) But it was the earlier end that continued to predominate, bringing Stoicism nearer and nearer to the selfish egotism of Epicurus. It is only in a community of wise ones that a man will marry or beget children. (Epict., "Diss.," iii. 27, 67.) A generation imbued with such philosophies would have as little thought of racial improvement as an age which found its guidance in the teachings of Schopenhauer and Hartmann.

Moreover, cosmopolitanism, consequent on the dissolution of the city state, not only brought individualism in its train, but let loose the inveterate pessimism of the Ancients. So long as the city state existed, the Greeks, forgetful of the Golden Age in the past and the inevitable cataclysm in the future, concerned themselves with the future progress of a limited race. But pessimism, linked with individualism, became a living force in a despairing age, which had never developed the evolutionary conceptions of Anaximander. Men of after generations will be just as foolish and unthinking, and just as short-lived. Neither the future nor the past matters, but only the present. ("M.A. Disc.," II2.) Sooner or later all things will be transmuted again into the fiery substance from which they came. Individualism and belief in inevitable decadence were the two influences which effectually thwarted the growth of Ancient Eugenics.

But this philosophy of Weltschmerz is an abandoned creed. Le temps de tristesses dogmatiques est passe. Organic evolution has changed our whole perspective. We see our wills as temporary manifestations of a greater Will: our sense of time and causation has opened out to the infinite, and we are learning to subordinate the individual lot to the specific destiny.

So Eugenics, ruthlessly practised in those distant ages, "when wild in wood the noble savage ran," rudely systematized, passed into the constitution of Sparta. The selfish creed of a warrior caste, even in the hands of Plato and Aristotle it never lost its parochialism, and when this narrow spirit gave way before the cosmopolitanism of subsequent philosophy, individualism, isolating human effort from a world rational only to the evolutionist, effectually checked the growth of the Eugenic ideal for centuries.

The Bell Curve and its Critics

"The Bell Curve" and its critics

Charles Murray Commentary, May 1995 v99 n5 p23(8)

Summary: 'The Bell Curve' has been subjected to a great deal of harsh criticism, but much of that criticism will likely lead to social research that will validate the research published in the book. Critics who assert that no valid single measure of intelligence exists are dismissed as unscholarly.

In November 1989, Richard Herrnstein and I agreed to collaborate on a book that, five years later, became *The Bell Curve*. It is a book about events at the two ends of the distribution of intelligence that are profoundly affecting American life. At one extreme, transformations in higher education, occupations, and federal power are creating a cognitive elite of growing wealth and influence. At the other extreme, transformations in occupations and social norms are creating a cognitive underclass. "Pressures from these contrasting movements at the opposite ends of society put terrific stress on the entire structure," we write in the preface, and we spend another 550 pages of main text and 300 pages of supplementary material explaining what we mean, and what we see as the implications for America's future.

The Bell Curve was released by the Free Press early in October 1994, a few weeks after Richard Herrnstein's death. The initial reaction was encouraging. Acting on Herrnstein's suggestion, the American Enterprise Institute (AEI) held a small conference of academics and journalists from various points on the political spectrum soon after the book's publication. The conference went well, with brisk exchanges about a book on which people had differing opinions but which they discussed over the course of two days as a serious and careful work of scholarship. Two weeks after the conference, Malcolm Browne's thoughtful review appeared in the *New York Times Book Review*, as did Peter Brimelow's long and favorable article in *Forbes* - still the best published synopsis of *The Bell Curve*.

Then came the avalanche. It seems likely that *The Bell Curve* will be one of the most written-about and talked-about works of social science since the Kinsey Report 50 years ago. Most of the comment has been virulently hostile. The book is said to be the flimsiest kind of pseudo-science. Designed to promote a radical political agenda. A racist screed. Methodologically pathetic. Tainted by the work of neo-Nazis.

"Never," my AEI colleague Michael Ledeen observes, "has such a moderate book attracted such an immoderate response." This is the central irony connected with the reaction to *The Bell Curve*. For if any one generalization can be made about a work as long and diverse as *The Bell Curve*, it is that the book is relentlessly moderate - in its language, its claims, its science. It is filled with "on the one hand. . . . on the other hand" discussions of the evidence, presentations of competing explanations, cautions that certain issues are still under debate, and encouragement of other scholars to explore unanswered questions that go beyond the scope of our own work. The statistical analysis is standard and straightforward.

Why then the hysteria? The obvious answer is race, the looming backdrop to all discussion of social policy in the United States. Ever since the first wave of attacks on the book, I have had an image of *The Bell Curve* as a sort of literary Rorschach test. I do not know how to explain the extraordinary discrepancy between what *The Bell Curve* actually says about race and what most commentators have said that the book says, except as the result of some sort of psychological projection onto our text.

Other factors are at work as well. Michael Novak (who has written favorably about *The Bell Curve*) and Thomas Sowell (who has his criticisms of the book) have pointed out in similar terms that the Left has invested everything in a few core beliefs about society as the cause of problems, government as the solution, and the manipulability of the environment for reaching the goal of equality. For the Left, as Novak puts it, *The Bell Curve's*

message cannot be true, because much more is at stake than a particular set of arguments from psychological science. A this-worldly eschatological hope is at stake. The sin attributed to Herrnstein and Murray is theological: they destroy hope.

I am sure Novak and Sowell are on the right track. The underlying reasons for the reaction to *The Bell Curve* will turn out to be significant in their own right, revealing much about the intellectual temper of our era. But perspective on those reasons must wait for some years. Let me make a more limited prediction: when the Sturm und Drang has subsided, nothing important in *The Bell Curve* will have been overturned. I say this not because Herrnstein and I were especially far-sighted, but because our conclusions are so cautiously phrased and our findings anchored so securely in the middle of the scientific road.

In the meantime I want to present my own assessment of where the debate stands. The problem is how to do it within a reasonable space and how to avoid being overtaken by events. A first wave of reviews and commentaries in the major media appeared between October 1994 and January of this year. A second wave, consisting of reviews in the academic journals, is on the way. I have already seen manuscript copies of some of these reviews, often highly technical, that will be published over the course of the next year.

The volume of all this material reaches many hundreds of pages. To comment in detail on even a

single one of the major reviews would require an article the length of this one. I will use this space instead to present a general proposition about *The Bell Curve*, and to illustrate it with examples.

My proposition is that the critics of *The Bell Curve* are going to produce the very effects that their attacks have been intended to avert. I am not here referring to the book's popularity with the reading public (it spent fifteen weeks on the *New York Times* bestseller list), although it seems true that the descriptions of *The Bell Curve* as an angry, racist polemic have led people in bookstores to pick it up to see what the fuss is about. The pages to which they turn are nothing like what they expect, their curiosity is piqued, and some of them buy it.

But the unintended consequences I have in mind go far beyond the sales that the attacks have stimulated. The attacks are also likely to affect intellectual trends. I foresee a three-stage process.

In the first stage, a critic approaches *The Bell Curve* absolutely certain that it is wrong. He feels no need to be judicious or to explore our evidence in good faith. He seizes upon the arguments that come to hand to make his point and publishes them, with the invective and dismissiveness that seem to be obligatory for a *Bell Curve* critic.

In the second stage, the attack draws other scholars to look at the issue. Many of them share the critic's initial assumption that *The Bell Curve* is wrong. But they nonetheless start to look at evidence they would not have looked at otherwise. They discover that the data are interesting. Some of them back off nervously, but others are curious. They look farther. And it turns out that there is much more out there than Herrnstein and I try to claim.

In stage three, these scholars start to produce new material on the topics that had come under attack in the first place. I doubt that many will choose to defend *The Bell Curve*, but they will build on its foundation and ultimately do far more damage to the critics' "eschatological hope" than *The Bell Curve* itself did.

I will give four examples of these unintended outcomes, drawing from the attacks on the "pseudo-science" of a general-intelligence factor; on the link between genes and race differences in IQ; on the power of the statistical evidence; and on our pessimistic assessment of society's current attempts to raise IQ through outside interventions.

Much of the attack on *The Bell Curve*'s science has been mounted not against anything in the book itself but against the psychometric tradition on which it is based. Specifically, Herrnstein and I accept that there is such a thing as a general factor of cognitive ability on which human beings differ: the famous *g*.

Ever since the late 1960's, when IQ became a pariah in the world of ideas, this has been a

politically-incorrect position to take. In the early 1980's, a book by Stephen Jay Gould, *The Mismeasure of Man*, cemented the discrediting of g among liberals outside the scientific community. His portrait of psychometrics as a pseudo-science pursued by charlatans was swallowed uncritically and enthusiastically by the elite media, as documented by Mark Snyderman and Stanley Rothman in *The IQ Controversy: The Media and Public Policy* (1988).

A central thesis of *The Mismeasure of Man* was that g is nothing more than a statistical artifact. Gould based his denial of a general mental factor on a series of claims about factor analysis, the statistical method for identifying g.

In a review of *The Bell Curve* in the *New Yorker*, Gould resurrects the same arguments. Echoing *The Mismeasure of Man*, he writes: "g cannot have inherent reality . . . for it emerges in one form of mathematical representation for correlations among tests and disappears (or greatly attenuates) in other forms, which are entirely equivalent in amount of information explained." He continues: "The fact that Herrnstein and Murray barely mention the factor-analytic argument forms a central indictment of *The Bell Curve* and is an illustration of its vacuousness." Where, Gould asks, is the evidence that g "captures a real property in the head"?

The reason that we "barely mention the factor-analytic argument" against the existence of g is that it has little scholarly standing. Gould's statistical indictment of g was refuted in various scientific quarters soon after the appearance of *The Mismeasure of Man*, and research into g proceeded without a noticeable blip.(1)

To see what this particular fight is about, a little background is essential. One of the earliest findings about mental tests was that the results of different tests of apparently different mental skills were positively correlated. Charles Spearman, the British founding father of modern psychometrics, was the first to hypothesize that they were correlated because each was tapping into a common construct - the general mental ability he then labeled g. Factor analysis was the method he used to extract this general factor that accounted for the intercorrelations among subtests.

Another pioneering psychometrician, L.L. Thurstone, who in the 1930's became Spearman's great antagonist by demonstrating how factor analysis need not yield a dominant general factor, is the hero of Gould's story. Gould is correct in stating that there are alternative methods with the same overall power to account for the correlations among the tests. But he is wrong when he implies that by using an alternative method, an analyst can get rid of g. As Richard Herrnstein liked to say, "You can make g hide, but you can't make it go away."(2)

Hence the frustration among psychometricians who have tried to make it go away. After applying the particular factor-analytic method that prevented g from emerging, they had nowhere to take the results. If they labeled their independent factors as distinct mental skills and developed a research agenda based on them, they got crushed by critics who could demonstrate

that their results were more elegantly explained by *g*. Indeed, *g* not only explained more variance than any other factor, it typically explained three times as much variance as all other factors combined.

But one need not rely only on statistical validation of *g*. By now there is also a growing body of evidence that links *g* (and IQ scores more generally) with neurophysiological functioning.⁽³⁾ An even larger body of evidence, covered in *The Bell Curve*, demonstrates *g*'s value for predicting academic achievement and job performance.

Gould's position, then, has been thoroughly discredited among scholars, however dominant it remains in the media. Had he kept quiet about *The Bell Curve* or attacked it on other grounds, his view might have continued to hold sway there. But when he repeated the same arguments in his *New Yorker* review - which I am told has been triumphantly circulated by nonpsychologists as the canonical refutation of *The Bell Curve* - he accomplished something that Herrnstein and I could not have done: he made scholars who know what the evidence shows angry enough to go public.

By and large, scholars in the field of intelligence are reclusive - the experiences of people like Arthur Jensen, Hans Eysenck, and Richard Herrnstein himself taught them that the consequences of being visible can be extremely punishing - and many of them were additionally disinclined to jump to the defense of a book coauthored by someone with my reputation as a right-winger. But Gould and, less visibly, his Harvard colleague Howard Gardner in a review of *The Bell Curve* in *American Prospect*, were saying things that were palpably wrong about a topic of deep importance to professionals in the field.

Some of these professionals responded with outraged letters to the *New Yorker* (none was printed). Then came a statement signed by 52 scholars and published in the *Wall Street Journal* in which all the main scientific findings of *The Bell Curve* were endorsed (without any explicit mention of the book or its critics). I also hear second-hand of incidents in which reporters have called scholars about "this pseudo-science *g* business" and received an answer they did not expect. The effects of the backlash are still taking shape, but the media may finally be getting the message. The big unreported story about the study of intelligence in the last decade is the remarkable resilience and importance of *g*.

I come now to the second example of how the attacks on *The Bell Curve* are likely to have unintended consequences: the determination of the critics to focus on race and genes, even though *The Bell Curve* does not.

The Bell Curve draws three important conclusions about intelligence and race: (1) All races are represented across the range of intelligence, from lowest to highest. (2) American blacks and whites continue to have different mean scores on mental tests, with the difference varying from test to test but usually about one standard deviation in magnitude - about fifteen IQ points. "One

standard deviation" means roughly that the average black American scores at the sixteenth percentile of the white distribution. (3) Mental-test scores are generally as predictive of academic and job performance for blacks as for other ethnic groups. Insofar as the tests are biased at all, they tend to overpredict, not underpredict, black performance.

These facts are useful in the quest to understand why (for example) occupational and wage differences separate blacks and whites, or why aggressive affirmative action has produced academic apartheid in our universities. More generally, Herrnstein and I write that a broad range of American social issues cannot be interpreted without understanding the ways in which intelligence plays a role that is often, and wrongly conflated with the role of race. When it comes to government policy, there was in our minds just one authentic implication: return as quickly as possible to the cornerstone of the American ideal that people are to be treated as individuals, not as members of groups.

The furor over *The Bell Curve* and race has barely touched on these core points. Instead, the critics have been obsessed - no hyperbole here - with genes, trying to stamp out any consideration of the possibility that race differences have a genetic component.

For the record, what we said about genes, IQ, and race in the book is that a legitimate scientific debate is under way about the relationship of genes to race differences in intelligence; that it is scientifically prudent at this point to assume that both environment and genes are involved, in unknown proportions(4); and, most importantly, that people are getting far too excited about the whole issue. Genetically-caused differences are not as fearful, nor environmentally-caused differences as benign, as many think. What matters is not the source but the existence of group differences, and their intractability (for whatever reasons).

Six months into my post-Bell Curve life, I have concluded that Herrnstein and I were prematurely right on this point. Certainly we were right empirically when we observed that the public at large is fascinated by the possibility of genetic differences, and that the intellectual elites have been "almost hysterically in denial about that possibility," as we put it in the book. I think we were also right in trying to dampen that fascination. But listening to some of my most loyal friends who insist that I must be disingenuous when I continue to say, that the genetic question is not a big deal, I have to conclude that we failed to make our case persuasively (on pp. 311-15 of *The Bell Curve*).

Yet the critics, in insisting that the issue of genes really is a big deal, are once again going to produce the very effect they want to avert. In this instance, they have based their attacks on the premise that a full, fair look at the data will make the issue go away. None appears to have recognized that Herrnstein and I did not make nearly as aggressive a case for genetic differences as the evidence permits.

The most abundant source of data that we downplayed is in the work of J. Philippe Rushton, a

Canadian psychologist who since 1985 has been publishing increasingly detailed material to support his theory, that the three races he labels Negroid, Caucasoid, and Mongoloid vary not just in intelligence but in a wide variety of characteristics. We put our brief discussion of Rushton in an appendix. The critics of *The Bell Curve* are putting him on the front page, often outrageously caricaturing his work.⁽⁵⁾ The trouble with this strategy is that Rushton is a serious scholar who has assembled serious data. The attacks on *The Bell Curve* ensure that those data will get attention.

A related example is the charge that *The Bell Curve* is based on "tainted sources." Charles Lane introduced this theme with an article in the *New Republic* and then a much longer one in the *New York Review of Books*. In the latter piece, he proclaimed that "No fewer than seventeen researchers cited in the bibliography of *The Bell Curve* have contributed to *Mankind Quarterly*, a notorious journal of 'racial history' founded, and funded, by men who believe in the genetic superiority of the white race." Lane also discovered that we cited thirteen scholars who had received grants from the Pioneer Fund, established and run (he alleged) by men who were Nazi sympathizers, eugenicists, and advocates of white racial superiority. Leon Kamin, a vociferous critic of IQ in all its manifestations, took up the same argument at length in his review of *The Bell Curve* in *Scientific American*.

Never mind that *The Bell Curve* draws its evidence from more than 1,000 sources. Never mind that among the scholars in Lane's short list are some of the most respected psychologists of our time, and that the "tainted sources" consist overwhelmingly of articles that were published in respected and refereed journals. Never mind that the relationship between the founder of the Pioneer Fund and today's Pioneer Fund is roughly analogous to the relationship between Henry Ford and today's Ford Foundation. The real effect of Lane and Kamin's work will be to focus academic attention on the main substantive issue they discuss relative to our "tainted sources," African IQ.

The topic of African IQ is a tiny piece of *The Bell Curve*: a three-paragraph section in chapter 13 intended to address a hypothesis Herrnstein and I heard frequently, that the test scores of American blacks have been depressed by the experience of slavery. We briefly summarize the literature indicating that African blacks in fact have lower test scores than American blacks.

Lane and Kamin assault this conclusion ferociously. We make a soft target - since we say so little about African IQ, it is easy for Lane and Kamin to point to the many technical difficulties of knowing exactly what is going on. But in *The Bell Curve* we also omit many more details making a strong case that African blacks have extraordinarily low scores on standardized mental tests, including ones especially designed for illiterate non-Western subjects. Lane and Kamin want this literature to be weak and racist. It is not, and it bears importantly, if inconclusively, on possible racial genetic differences.

When the story of African IQ is eventually untangled, the safest bet is that the roles of nutrition,

education, culture, and genes in the development of cognitive functioning will turn out to be complex and intertwined. In other words, I still think Herrnstein and I were right, if prematurely: it is possible to live with the truth about genes and race, whatever it may be, without changing one's mind about how a liberal society should function. But whether we were right or wrong, the violent reaction is making sure that the full range of data will be brought to public attention.

The third line of attack on *The Bell Curve* that I predict will have an unintended outcome is the attempt to dismiss the statistical power of the book's results.

Perhaps the most important section of *The Bell Curve* is Part II, "Cognitive Classes and Social Behavior." It describes the relationship of IQ to poverty, school-dropout rates, unemployment, divorce, illegitimacy, welfare, parenting, crime, and citizenship. To avoid the complications associated with race, it does all this for a sample of whites, using the National Longitudinal Study of Youth.

The eight chapters in Part II deal with questions like: "What role does IQ play in determining whether a woman has a baby out of wedlock?" Or: "What are the comparative roles of socioeconomic disadvantage and IQ in determining whether a youngster grows up to be poor as an adult?" These are fascinating questions. But you will have a hard time figuring out from the published commentary, on *The Bell Curve* that such questions were even asked, let alone what the answers were.

Instead, the main line of attack has been that there is really no need to pay any attention to those chapters, because Herrnstein and Murray confuse correlation with causation; because IQ really does not explain much of the variance anyway; and because the authors' measure of socioeconomic background is in any case deficient. On all three counts, the critics are setting up a reexamination of the existing technical literature on social problems that will be intellectually embarrassing to them in the end.

First, regarding correlation and causation, here, boiled down, is what we say in the introduction to Part II: The nonexperimental social sciences cannot demonstrate unequivocal causality. In trying to explain such things as poverty, illegitimacy and crime, we will use statistics to show what independent role is left for IQ after taking a person's age, socioeconomic background, and education into account. When there are other obvious explanations - family structure, say - we will take them into account as well. Apart from the statistics, we will describe in common-sense terms what the nature of the causal link might be - why for example, a poor young woman of low intelligence might be more likely to have a baby out of wedlock than a poor young woman of high intelligence. At the end of this exercise, repeated in similar form for each of the eight chapters in Part II, there will still be unanswered questions, and we will point to many of those unanswered questions ourselves. But the reader will know more than he knew before, and the way will be opened for further explorations by our colleagues.

The statistical method we use throughout is the basic technique for discussing causation in nonexperimental situations: regression analysis, usually with only three independent variables. We interpret the results according to accepted practice. To enable readers to check for themselves, we include the printout of all the results in Appendix 4.

The assault on this modest analysis has been led by Leon Kamin in *Scientific American*. There he argues that the role of IQ cannot be disentangled from socioeconomic background; he suggests that in our database the children of laborers have such uniformly low IQ scores that no one can possibly tell whether the low IQ or the disadvantaged background is to blame for the higher rates of crime, unemployment, and illegitimacy that afflict such youngsters. "The significant question," Kamin writes, "is, why don't the children of laborers acquire the skills that are tapped by IQ tests?"

My answer to his significant question is: "Often, they do acquire such skills," which is what makes the data so interesting. In America, bright children of laborers tend to do quite well in life, despite their humble origins. Conversely, dull children from privileged homes tend to do poorly, despite all the help their parents lavish on them.

Herrnstein and I contend that such patterns point to causation. This is indeed an inference - a sensible inference.

We approached the correlation/causation tangle in other sensible ways as well. Consider the vexing case of education. People with high IQ's tend to spend many years in school; people with low IQ's tend to leave. Does the IQ cause the years of education, or the years of education the IQ?

For various technical reasons, simply entering education as an additional independent variable is unwise. So instead we defined two subsamples, each with the same amount of education - one of adults who had completed exactly twelve years of school and obtained a high-school diploma, no more and no less; the other of adults who had completed exactly sixteen years of school and obtained a bachelor's degree, no more and no less. For each topic, we accompanied the analysis of the entire sample with separate analyses of the high-school and college samples. Thus the reader could take a look at the independent effect of IQ for people with identical education.

Our procedure has irritated a number of academic critics (notably James Heckman and Arthur Goldberger) who grumble that the state of the art permits much more. Yes, it does, and in the book we say how much we look forward to watching our colleagues apply those more sophisticated techniques to the unanswered questions. But more sophisticated modeling techniques would also have opened a wide variety of technical problems that we wanted to avoid. The procedure chose gave an excellent means of bounding the independent effects of education, and that was our purpose.

But let us say a critic grants the existence of independent relationships between IQ and social outcomes after holding other plausible causes constant. How important are these "independent relationships"? Hardly at all, says Stephen Jay Gould: The Bell Curve can safely be dismissed because IQ explains so little about the social outcomes in question - just a few percent of the variance, in the statistician's jargon.

Here is the truth: the relationships between IQ and social behaviors that we present in The Bell Curve are not only "significant" in the standard statistical sense of that phrase, they are powerful in a substantive sense, often much more powerful than the relationships linking social behaviors with the usual suspects (education, social status, affluence, ethnicity). In fact, Herrnstein and I actually understate the strength of the statistical record in The Bell Curve. The story is complex, but worth recounting because it tells so much about the academic response to The Bell Curve.

In ordinary multiple-regression analysis, "independent variables," the hypothesized causes, are related to a "dependent variable," the hypothesized effect. Two statistics are of special interest. The first is the set of regression coefficients, one for each independent variable, which tell you the magnitude of the effect each independent variable has on the dependent variable after taking the role of all the other independent variables into account. Each coefficient has a standard error, which may be used to determine whether the coefficient is statistically significant (i.e., unlikely to have been produced by chance). The second statistic of special interest is the square of the multiple correlation, written as $[R.\text{sup.}2]$ (pronounced "r square"), that tells you how much of the variance in the dependent variable is explained by all the independent variables taken together.

One of the early topics about multiple regression that graduate students study is the different uses of regression coefficients and $[R.\text{sup.}2]$. If you have a coefficient with a large value and small standard error, it is typically the statistic of main interpretive importance, while $[R.\text{sup.}2]$ is of secondary and sometimes trivial importance. Such is the case with the kind of analysis in The Bell Curve, for reasons we explain in Appendix 4.

In all this, we treat our data as our colleagues around the country treat regression results every day. There is nothing controversial here - as evidenced by the fact that none of the quantitative social scientists who reviewed this part of our manuscript before publication raised a question about our methods.

But that is not the end of the story. Herrnstein and I make reference to the $[R.\text{sup.}2]$ in Appendix 4 as if they represent "explained variance" - and thereby we commit a technical error, falsely understating the overall explanatory power of our statistics. In logistic regression analysis - the particular type we use throughout Part II - the statistic labeled $[R.\text{sup.}2]$ is an ersatz and unsatisfactory attempt to express the model's goodness-of-fit. Most statisticians to whom I have talked since say we should have ignored it altogether. Stephen Jay Gould, and others who are making the same criticism he does, have fallen into the same error.

It would be nice if a few respected professors would publicly point out that, whatever else one might think about *The Bell Curve*, the criticisms of the book's small [R.sup.2.s] are wrong. But this is unlikely to happen. Probably the allegation will quietly fade away as the academics who know the true story discreetly impart the news to those who do not.

The unfounded criticisms of the statistics in *The Bell Curve* that I have discussed so far will merely cause embarrassment among a few who both understand the issues and have the decency to be embarrassed. The real potential for backfire in the statistical critique of *The Bell Curve* comes from the attack on our use of socioeconomic status (SES).

Measures of SES are a staple in the social sciences. Leaf through the dozens of technical articles in sociology and economics dealing with issues of success and failure in American life, and you will frequently find a measure of SES as part of the analysis. A major purpose of *The Bell Curve* was to add IQ to SES as an explanatory variable. To avoid controversy, we deliberately constructed an SES index that uses the same elements everybody else uses: income, occupation, and education. We did not have an a-priori reason for weighting any of these more heavily than the others, so we converted them to what are called "standard scores" and added them to get our index - all of which would ordinarily have caused no comment.

But when it comes to *The Bell Curve*, a standard SES index suddenly becomes problematic. James Heckman notes ominously that we do not have income data for a large part of the sample. Arthur Goldberger looks suspiciously on the idea of standardizing the variables. Leon Kamin hypothesizes that probably the self-reports of income, education, and occupation are exaggerated to a degree that falsely produces the relationships we report.

My response to such criticisms is, fine, let us test out these potential problems. Compare the results for the subsamples with and without income data. Do not standardize the variables; create some other scales and use some other method of combining them. Examine the validity of the self-report data. Examine what happens when the constituent variables are entered separately instead of as an index.

As scholars are supposed to do, Herrnstein and I checked out these and many other possibilities - the results reported in *The Bell Curve* were triangulated in numbing detail over the years we worked on the book - and we knew what the critics who bothered to retrace our steps would discover: that there is no way to construct a measure of socioeconomic background using the accepted constituent variables that makes much difference in the independent role of IQ. In the jargon, our measure of SES is robust, and as valid as everyone else's has been.

But there's the rub: how valid has everyone else's been? Until *The Bell Curve* came along, measures of SES similar to ours were used without a second thought. Now, suddenly they are to be questioned. I doubt whether the profession will be able to confine the questioning to just *The*

Bell Curve. What Herrnstein and I have done, in effect, is to throw down a challenge: if you don't like the way IQ dominates this thing we call "socioeconomic status" in producing important social outcomes, come up with another means of measuring the environment that produces results you like better.

Such measures can probably be developed - but they will not be ones that the critics of The Bell Curve will like. Suppose, for example, that one can create a good measure of "the degree of presence and competency of a father in the raising of a female child." That might have a large independent effect on the girl's chances of giving birth to a baby out of wedlock, whatever her IQ. Suppose that one can create a good measure of "the degree to which a young male is raised in an environment where high moral standards are enforced consistently and firmly." Again, I can imagine this having a major effect on the likelihood of his becoming a criminal, independently of IQ.

But the same measures that compete with the importance of IQ are going to make starkly clear something that The Bell Curve has already suggested: the kinds of economic and social disadvantages that liberals have traditionally treated as decisive are comparatively unimportant. It may sound like an issue that concerns only the social scientists. Far from it. If I were to nominate the biggest sleeper effect to emerge from The Bell Curve debate, it would be the collapse of SES as a way of interpreting social problems. The rationale for liberal social policy cannot easily do without it.

Raising the question of policy brings us to the last of my four examples of the potential backfire effect of attacks on The Bell Curve - the malleability of IQ. These attacks focused on Chapter 17, "Raising Cognitive Ability," which chronicles the record of attempts to raise IQ through better nutrition, prenatal care, infant intervention, and preschool and in-school programs. The cries of protest here have been almost as loud as those directed at our chapter on race, and for the reason that Michael Novak identified: by arguing that no easy methods for raising IQ exist, we "destroy hope," or at least the kind of hope that drives many of the educational and preschool interventions for today's disadvantaged youth.

We do express hope, actually. Because the environment plays a significant role (40 percent is our ball-park estimate) in determining intelligence - a point The Bell Curve states clearly and often - we say that sooner or later researchers ought to be able to figure out where the levers are. We urge that steps be taken to hasten the day when such knowledge becomes available.

But in examining the current state of knowledge, we also urge realism. Speaking of the most popular idea, intensive intervention for preschoolers, we conclude that "we and everyone else are far from knowing whether, let alone how, any of these projects have increased intelligence." We also predict that "many ostensibly successful projects will be cited as plain and indisputable evidence that we are willfully refusing to see the light."

This prediction has been borne out. Thus, the psychologist Richard Nisbett, writing in *The Bell Curve Wars*,⁽⁶⁾ a compendium of attacks on our book, accuses us of being "strangely selective" in our reports about the effects of intervention, and wonders if we were "unaware of the very large literature that exists on the topic of early intervention."

The "very large literature" of which we were unaware? The only study Nisbett mentions that we do not is one published in *Pediatrics* in 1992 which he describes as showing a nine-point IQ advantage at age three for participants in the intervention. Nisbett neglects to acknowledge the unreliability of IQ measures at age three. More decisively, Nisbett is apparently unaware that a follow-up of the same project was published in 1994, when the children were, at age five, old enough for IQ scores to begin to become interpretable. The results? The experimental group had an advantage of just 2.5 points on one measure of IQ and two-tenths of a point on another - both differences being substantively trivial and statistically insignificant.⁽⁷⁾ In other words, the only study in "the very large literature" that we missed does not contradict our conclusion that such interventions have provided promising leads but no more.

I will make two broader statements. First, in the critiques to date, no one has pointed to a credible study containing evidence of significant, long-term effects on cognitive functioning that we do not consider in *The Bell Curve*. Second, our account of the record to date is, if anything, generous. The two major intensive interventions for raising the IQ of children at high risk of mental retardation - Project Milwaukee and the Abecedarian Project - have come under intense methodological criticism in the technical literature. We allude to the controversy in the book, but in neither case is the evidence so clear that we could come down hard on the "no-effect" conclusion, and so we do not. If we err, it is in the direction of giving more credit to the interventions than is warranted.

But just as we predicted, many others are nominating "programs that work" that we mysteriously failed to consider. And I am sure that some of them do work, for goals other than raising IQ. We would be the last to suggest that education cannot be made better, or that the socialization of children cannot be improved. But in *The Bell Curve* we talk about a particular goal: improving the cognitive functioning of human beings over the long term. On that score, the record remains as Herrnstein and I describe it: yes, it can be done, but at present only in modest amounts for most children, usually temporarily, and inconsistently.

In this instance, I have reason to hope that the unintended effect of the attacks on *The Bell Curve* will be to crystallize a debate that has long needed crystallizing. The cry that "Herrnstein and Murray are too pessimistic" is going to force a great many claims to be laid on the table for examination. Thus, Howard Gardner's review takes us to task for not citing Lisbeth Schorr's book, *Within Our Reach*. I would be delighted to join in a rigorous examination of the programs Schorr describes, and see whether we find among them hard evidence of long-term improvement in cognitive functioning. Let us bring up all the other nominees for inspection as well. In short, let us use the furor over *The Bell Curve* finally to come to grips with how difficult it is, given

the current state of knowledge, for outside interventions to make much difference in the environmental factors that nurture cognitive development.

If outside interventions are not promising, what about the more general phenomenon we label the "Flynn effect" (after the political scientist James Flynn, who has done the most to bring it to public attention), whereby IQ scores have been rising secularly throughout the world since at least the 1930's? As Thomas Sowell has argued in the *American Spectator*, the Flynn effect gives reason to conclude that intelligence is malleable after all. Herrnstein and I allude to that possibility without expressing much optimism about it. Moreover, even if the rise in IQ scores could be taken at face value, we would still not know how to intervene so as to manipulate it. In our view (as in Flynn's), it seems likely that most of the increase in IQ scores over time represents something besides gains in cognitive functioning. But what that something is remains unclear, and this issue is still wide open.

A few weeks after *The Bell Curve* appeared, a reporter remarked to me that the real message of the book is "Get serious." I resisted at first, but I now think he had a point.

We never quite say it in so many words, but the book's subtext is that America's discussion of social policy since the 1960's has been carried on in a never-never land where human beings are easily changed and society can eventually become a Lake Wobegon where everyone is above average. *The Bell Curve* does indeed imply that it is time to get serious about how best to accommodate the huge and often intractable individual differences that shape human society. This is a counsel not of despair but of realism - including realistic hope. An individual's *g* may not be as elastic as one would prefer, but the inventiveness of the species seems to have few bounds. In *The Bell Curve*, we are matter-of-fact about the limits facing low-IQ individuals in a postindustrial economy, but we also celebrate the capacity of people everywhere in the normal range on the bell curve to live morally autonomous, satisfying lives, if only the system will let them. Accepting the message of *The Bell Curve* does not mean giving up on improving social policy, it means thinking anew about how progress is to be achieved - and even more fundamentally, thinking anew about how "progress" is to be defined.

The verdict on the influence of *The Bell Curve* on policy is many years away. For now, the book may, have another useful role to play that we did not anticipate. The attacks on it have often read like an unintentional confirmation of our view of the "cognitive elite" as a new caste, complete with high priests, dogmas, heresies, and apostates. They have revealed the extent to which the social science that deals in public policy has in the latter part of the 20th century become self-censored and riddled with taboos - in a word, corrupt. Only the most profound, anguished, and divisive reexamination can change that situation, and it has to be done within the profession. If *The Bell Curve* achieves nothing else, I will be satisfied if it helps get such a reexamination going.

(1) For a survey of the contrasting receptions of *The Mismeasure of Man* accorded by the press and by the scientific community, see Bernard Davis's "Neo-Lysenkoism, IQ, and the Press" (*Public Interest*, Fall 1983).

(2) For those who want to pursue the technical issues, I recommend John B. Carroll's recent book, *Human Cognitive Abilities: A Survey of Factor-Analytic Studies* (Cambridge University Press, 1993). Carroll, former director of the L.L. Thurstone Psychometric Laboratory, points out that Thurstone himself came to accept the notion of a general factor in his later years.

(3) For examples, see A.R. Jensen, "The g Beyond Factor Analysis," in R.R. Ronning, J.A. Glover, J.C. Conoley, and J.C. Witt (eds.), *The Influence of Cognitive Psychology on Testing*, or B. Bower, "Images of Intellect: Brain Scans May Colorize Intelligence," *Science News* (October 8, 1994).

(4) Intelligence is known to be substantially heritable in human beings as a species, but this does not mean that group differences are also heritable. Despite our explicit treatment of the issue, it is perhaps the single most widespread source of misstatement about *The Bell Curve*.

(5) For Rushton's argument and evidence, see J. Philippe Rushton, *Race, Evolution, and Behavior: A Life History Perspective* (Transaction Books, 398 pp., \$34.95).

(6) Edited by Steven Fraser, Basic Books, 216 pp., \$10.00 (paperback).

(7) Jeanne Brooks-Gunn et al., "Early Intervention in Low-Birth-Weight Premature Infants," *JAMA*, vol. 272 (1994).

Commentary: Replies and Counter-replies

Heckman, James J.; Kamin, Leon J.; Lane, Charles; Lewis, Lloyd B.; Loury, Linda Datcher; Nisbett, Richard E.; Rushton, J. Philippe; Ryan, W.H.; van den Haag, Ernest

Commentary, August 1995 v100 n2

To The Editor of Commentary:

In "'The Bell Curve' and Its Critics" [May], Charles Murray does your readers a disservice by using the same standards of evidence and scholarship that he adopted in the book he wrote with the late Richard J. Herrnstein. By portraying himself as a persecuted scholar held to higher standards than other social scientists by his critics, he hints darkly at a unified conspiracy against him by like-minded but intellectually slovenly social scientists.

The academic response to his book does not present a united front. There is much more subtlety to the criticism of his work than Mr. Murray's broad-brush summary conveys. It is surely disingenuous for him to lump serious academic criticism with the inflammatory journalistic reviews that appeared in the popular press. As one of the critics mentioned by name, and the first person thanked in the acknowledgments section of *The Bell Curve*, I wish to report that Mr. Murray does not mention or respond to any of my substantive criticisms of his work, nor does he mention any of the fundamental points of agreement that have emerged in the literature that responds to his work. (My survey is scheduled for publication in the October 1995 issue of the journal of *Political Economy*, the house journal of the University of Chicago. A more popular version appeared in *Reason* magazine, March 1995.)

The basic premise of the book is that g--or a single factor of intelligence--explains behavior, and that it is immutable. An essential flaw in this argument is that it equates skill with general intelligence, contrary to the findings of a large body of research in social science. No one denies that "one factor" accounts for "a lot" of the variability in test scores across persons. But using the methodological standards adopted by Herrnstein and Murray themselves, more than one factor is required to explain test scores and wages. In reality, as many as four factors are required to explain wages.

Mr. Murray's appeal for support to the work of Raymond Carroll is misleading. Carroll's reanalysis of test-score data does not support the single g model--contrary to the claims made by Mr. Murray (see p. 706 of Carroll's *Human Cognitive Abilities*, 1993). In fact, Carroll finds

evidence that multiple skills explain social performance, and account for correlations among tests.

None of this denies that ability tests predict something valued in society. But Carroll's evidence and the evidence cited in my review indicate that many skills affect outcomes and not all can be equated with native intelligence. Once this is recognized, a core argument in *The Bell Curve* evaporates and a much more subtle analysis of social policy is required. Even if IQ cannot be manipulated, partial offsets for it are available because success in life depends on more than raw intelligence.

Mr. Murray seeks to avoid the hard job of evaluating social programs designed to boost skills by claiming that skills are synonymous with IQ; that IQ cannot be manipulated; and that nothing else can compensate for a low IQ. There is ample evidence that Mr. Murray's measure of "intelligence"--really a score on an achievement test--can be manipulated by educational interventions, that many skills besides raw intelligence are valued in society, and that these skills can be produced by environment.

JAMES J. HECKMAN University of Chicago Chicago, Illinois

To The Editor of Commentary:

Charles Murray's brief attempted rebuttal of the article I published over six months ago in the *New York Review of Books* consists mainly of a distortion of my arguments and, even more unfortunately a whitewash of the Pioneer Fund--the far-right organization which funded much of the pseudo-scholarship upon which *The Bell Curve* relies.

Mr. Murray writes that I "alleged" Pioneer was "established and run by men who were Nazi sympathizers, eugenicists, and advocates of white racial superiority."

There is nothing alleged about it. The 1937 charter of the Pioneer Fund specified its goal as aiding "parents of unusual value as citizens," who were defined as those "descended primarily from white persons who settled in the original thirteen states prior to the adoption of the Constitution of the United States."

Wyckliffe Draper, whose fortune founded the Pioneer Fund, was an ardent eugenicist. The most ideologically influential of the fund's five founding directors, Harry Laughlin, was superintendent of the Eugenics Record Office and campaigned in the U.S. for the sterilization of the "feeble-minded." He served as honorary vice president (in absentia) of a eugenics conference in Berlin in 1935, and drummed up support in the U.S. for Nazi eugenics policy. It was Laughlin who persuaded Draper to undertake the Pioneer Fund's first activity, in 1937: funding the distribution in America of an edited version of the German eugenics propaganda film *Erbkrank* ("Hereditary Illness").

"Never mind," Mr. Murray adds, that "the relationship between the founder of the Pioneer Fund and today's Pioneer Fund is roughly analogous to the relationship between Henry Ford and today's Ford Foundation."

This is a spurious analogy. Yes, in 1918 Henry Ford published a series of anti-Semitic tracts in his Dearborn newspaper, including the Protocols of the Elders of Zion. Nine years later, he apologized (sincerely or not), retracted his statements, and shut down the newspaper. In 1936, he created the Ford Foundation to support the Henry Ford Hospital and other charitable activities in Michigan. Henry Ford died in 1947; his heirs eventually surrendered all control over the selection of directors and the funding activities of the foundation. Not surprisingly, then, Henry Ford's anti-Semitism and right-wing ideology have no lingering influence whatsoever over today's Ford Foundation, which has an endowment of \$6.8 billion and 400 employees worldwide. Ford grants, in fact, are frequently criticized for supporting left-wing minority organizations.

Today's Pioneer Fund, by contrast, has made no apology, even a perfunctory one, for the extreme right-wing leanings of its founders. The only changes have been cosmetic, such as deleting the reference to "white" persons from its charter--in 1985. Such concessions to fashion aside, the Pioneer Fund remains true to the essential purposes of its founders. Virtually every project the fund has underwritten has had to do with "proving" the mental inferiority of black people.

This is largely because the \$5-million fund consists of a group of five unpaid "directors," of whom the only fully active decision-maker is Harry Weyher. Weyher, a New York lawyer, is the chosen successor of Wyckliffe Draper. Draper picked him because of his ideological reliability; Weyher shared Draper's opposition to the *Brown v. Board of Education* decision.

According to Mr. Murray, the "main substantive issue" I discuss relative to his book is African IQ. In fact, my article also took on his arguments about Asian IQ, and his claims about the purported impact of immigration on America's intelligence supply.

As for the matter of African IQ, however, my article did not, as Mr. Murray's distorted summary would have it, "point to the many technical difficulties of knowing exactly what is going on." Rather, I pointed out that Mr. Murray's data contradict his own contention--which was that low African IQ scores suggest that the low scores of African-Americans are due to genetic and other factors, rather than a history of oppression in the United States.

Mr. Murray's claim of extremely low African IQ derives from tests conducted in South Africa before the end of apartheid. This fact was not revealed in *The Bell Curve*--and small wonder. South Africa is hardly a place to find black people free from the effects of centuries of oppression. In fact, low IQ scores there can easily be construed to support the view that lower

black intellectual achievement is a result of racism. This is anything but a "technical" issue.

Mr. Murray's "facts" about Africa came from Pioneer-funded British psychologist Richard Lynn. Lynn, an editor of the notoriously racist journal *Mankind Quarterly* (which, pace Murray, is neither "respected" nor "refereed"), is on record in support of the scientifically absurd view that the "proliferation" of the poor and other "weak specimens" needs to be discouraged in the interests of "the genetic quality of the group."

Not surprisingly, then, this "scholar" accepted South African IQ test results at face value, as a fair test of the inherent intellectual capabilities of blacks not only in South Africa but in the continent as a whole. And Mr. Murray replicated his error.

In 1968, Richard Nixon had a secret plan to end the war in Vietnam. Charles Murray now assures us that he has "many more details" that would clinch his argument about African IQ, but these were omitted from *The Bell Curve* because--well, Mr. Murray doesn't say why. He does say that I "want this literature to be weak and racist." How can I "want" it to be anything, when I don't even know it exists?

Perhaps Charles Murray did not know all the facts about the Pioneer Fund and *Mankind Quarterly* when he wrote his book. But now that he does, he must cease to deny them. He must deal openly and honestly with their implications for *The Bell Curve*. For a man who depicts himself in the pages of *Commentary* as a brave struggler for unpleasant but vital truth, this is an appropriate test of intellectual courage. The Pioneer Fund and *Mankind Quarterly* are not mainstream, modern scientific institutions. They are scientific racism's keepers of the flame. And scientific racism is one of the scourges of this century.

CHARLES LANE New, Republic Washington, D.C.

To The Editor of *Commentary*:

There are few things more predictable than an author's response to reviews of his work, so it is not surprising that Charles Murray found Peter Brimelow's review to be "the best published synopsis of *The Bell Curve*." Brimelow likened the book to Darwin's *Origin of Species*, "the intellectual event with which it is being seriously compared." Brimelow, who wants immigration laws changed so that America's "racial balance" will be "shifted back . . . where it was in 1960: almost 89 percent white . . .," shares Mr. Murray's abhorrence of affirmative action and "quotas." Those quotas favor blacks and Latinos.

What was not so predictable was the enormously successful marketing campaign for *The Bell Curve* engineered by the American Enterprise Institute (AEI) and the Free Press. The barrage of reviews in major newspapers and magazines, just as the book was published, propelled it to the bestseller lists and the talk shows, and into public consciousness. The reviews were carefully

cultivated by AEI. Mr. Murray, in Commentary, described an AEI-sponsored "conference of academics and journalists from various points on the political spectrum [held] soon after the book's publication." The authors of many journalistic puff pieces, including Brimelow, had been invited to that conference, expenses paid, and had been provided with advance copies of the book.

The Wall Street Journal--it occupies a point well to the Left on Murray's political spectrum--indicated that the book had been "swept forward by a strategy that provided book galleys to likely supporters while withholding them from likely critics." The Journal suggested that AEI "tried to fix the fight when it released review copies selectively, contrary to usual publishing protocol." That charge was denied by AEI president Christopher DeMuth, who in a letter to the Journal indicated that the conference had in fact been held "several weeks before publication." DeMuth asserted that he had "made a particular effort to attract likely critics to the conference ... with the [deliberate] exception of Leon Kamin." That most unkindest cut smarts, but I will try now to rise to the critical occasion. My allotted space permits adequately detailed discussion of only a single topic. I will focus here on the Herrnstein-Murray treatment of race and IQ. (My detailed critique of the book appears in *The Bell Curve Debate*, edited by R. Jacoby and N. Glauber, Times Books/ Random House.)

Mr. Murray describes his book as "relentlessly moderate--in its language, . . . filled with 'on the one hand, on the other hand' discussions.... Anchored securely in the middle of the scientific road." But the book's description of affirmative action as "a poison leaking into the American soul" suggests passion, not moderation; and the even-handedness of Mr. Murray's middle-of-the-road position is exemplified by his comments on the relationship of genes to race differences in IQ. On the one hand, "it is scientifically prudent at this point to assume that both environments and genes are involved, in unknown proportions." But, on the other hand, "Herrnstein and I did not make nearly as aggressive a case for genetic differences as the evidence permits."

The nonaggressive approach taken in *The Bell Curve* was to examine a hypothesis Herrnstein and I heard frequently, that the test scores of American blacks have been depressed by the experience of slavery. We briefly summarize the literature indicating that African blacks in fact have lower test scores than American blacks ... on standardized mental tests, including ones especially designed for illiterate non-Western subjects.

The logic here is: if slavery made American blacks dumb, then African blacks, who have merely been colonized, not enslaved, should be smarter than their genetic kinfolk in America. But in fact they are dumber! So American blacks must be dumb because of their genes. There is still a problem, however. Why should American blacks be smarter than their African cousins? Herrnstein and Murray maintain that "The IQ of 'colored' students in South Africa--of mixed racial background--has been found to be similar to that of American blacks." Miscegenation appears to have paid off, to the tune of some 15 IQ points for American blacks. That follows since Richard Lynn, described in *The Bell Curve* as "a leading scholar of racial and ethnic

differences," after summarizing the literature, estimated the average IQ of Africans to be 70. That is to say, half of all Africans are mentally retarded. That finding evidently struck Herrnstein and Murray as reasonable. What, one wonders, would Mr. Murray's more aggressive case for genetic differences look like?

But let us examine the test, widely used in Africa, which was "designed for illiterate non-Western subjects." The test is Raven's Progressive Matrices. Average scores on the Matrices, like those on other "IQ" tests, have been rising steadily over time throughout the world. A massively large study of Dutch draftees, using the Matrices, found that average IQ scores in Holland had risen by about 25 IQ points between 1950 and 1982! Richard Lynn concluded that

requirements for a culture-fair test are far from being met by the Progressive Matrices. . . . The testee has to decipher the code and then solve the progression problem. These largely arithmetical skills are of course taught in schools. Dutch adolescents in the 1980's have enjoyed significantly more schooling ... no doubt they have picked up a few more arithmetical skills....

These observations did not prevent Lynn, four years later, from tabulating, in a review article, numerous African studies using the Matrices. The Bell Curve depended upon that review-article for its estimates of genetically debased African IQ.

Lynn himself felt that "the best single study of the Negroid intelligence" was performed in South Africa by Kenneth Owen, using the Junior Aptitude Tests. Zulu school-children did very poorly on the test, so much so that Lynn judged their average IQ to be 69. Owen (but not Lynn, or Herrnstein and Murray) pointed out that "the knowledge of English of the majority of black testees was so poor that certain [of the] tests . . . proved to be virtually unusable." To do well, Owen wrote, Zulu pupils would have had to have been familiar with electrical appliances, microscopes, and "Western type of ladies' accessories."

Charles Murray has written that "the social science that deals in public policy" has become "in a word, corrupt." Pithy, and the shoe does fit The Bell Curve.

LEON J. KAMIN Northeastern University Boston, Massachusetts

To The Editor of Commentary:

Charles Murray takes the stance that many people have made an inappropriate fuss over The Bell Curve's treatment of race and IQ, and professes himself bemused that "the critics have been obsessed--no hyperbole here--with genes . . . ," inasmuch as the book simply makes the point that

a legitimate scientific debate is under way about the relationship of genes to race differences in intelligence; that it is scientifically prudent at this point to assume that both environment and

genes are involved, in unknown proportions; and, most importantly, that people are getting far too excited about the whole issue.

If this were all the book had really said on the topic of race and IQ, the furor would indeed be a puzzle. But in fact, Herrnstein and Murray make three assertions about race and IQ pointing to the likely biological basis of race differences in IQ and to the probability that they are not eradicable by any means currently known.... (I have recently criticized the way Herrnstein and Murray make these points in a chapter in *The Bell Curve Wars*, edited by Steve Fraser, Basic Books.)

First, as to Herrnstein and Murray's purported "review" of the direct evidence on heritability of race differences in IQ. This consists of presenting, at substantial length, only one of seven extant studies on the question. This is an adoption study showing that black children adopted into white families have lower Iq's than white children adopted into white families. Despite the original investigators' cautions that their study could not be taken as evidence for a genetic basis for IQ differences between the races--for a variety of reasons ranging from the possibility that white children might have been placed with more intelligent families to the possibility that emotional and adjustment difficulties would have been present for the black adoptees--Herrnstein and Murray declare the study to constitute strong evidence of the heritability of race differences.

The remaining six studies are all more consistent with the alternative position that genetic differences are negligible or that they favor blacks slightly. Herrnstein and Murray dismiss one of these studies in a single paragraph, citing interpretive difficulties of the same sort they neglect to mention for the study they favor. Another study is dismissed on the same sort of grounds in a note in the appendix. The other four studies are not mentioned at all.

The second major point of the case for genetics is that one cannot hope that low cognitive abilities of either blacks or whites can be much improved by intervention of any kind. They review two studies on intervention in infancy, both of which had very positive results but which they reject on methodological grounds. They ignore a dozen studies not subject to such criticisms but having results consistent with the two they reject. These additional studies include a recent, very large study conducted at eight different sites.

Herrnstein and Murray conclude that although vigorous post-infancy, preschool interventions boost IQ by 7 points or so, this is of little importance because gains fade by third grade. Yet it should be obvious (except to those holding dubious "ballistic" or "critical-period" theories of early intervention) that one would expect gains to be maintained only if enrichment were maintained. Herrnstein and Murray do not mention the evidence that this is, in fact, the case. More importantly, with one exception, they do not mention the interventions that have been initiated in elementary school. William J. Bennett, Ronald Reagan's Secretary of Education, has described a score of such programs that have proved effective. Detailed reports on many of them appear in the education literature. The single elementary-school study reported on in *The Bell*

Curve is an intervention that produced a gain of between 1.5 and 6.5 IQ points in a single year. This they discount because it is only one study and data could not be obtained on the question of the maintenance of the gains.

Though it is known that intermediate-school and high-school math programs can have a very dramatic effect on minority children's math scores, this is also not mentioned. Finally, college programs exist that have a marked impact on minority achievement in several different specific fields, and on overall grade-point average. Yet again none of these demonstrations is mentioned.

In short, the review of intervention programs is so highly selective as to be misleading in the extreme, and so negative about the programs it does discuss as to forfeit any claim to represent balanced analysis.

Now, as for the 15-point gap in IQ between blacks and whites, Herrnstein and Murray refer to 10 studies of the current gap in IQ (or in a composite of abilities that is highly correlated with IQ). Summarizing these studies, they allow that the gap might have narrowed to 12 or 13 points now, though elsewhere in the book and several times in recent public statements by Mr. Murray, including his article in *Commentary*, this gap is restored to a full 15 points. In fact, however, the current gap indicated by the median value of the studies reviewed by Herrnstein and Murray, and using the numbers they supply, is 9 points. Their description of these data goes beyond dubious analysis, beyond irresponsibly selective choice of evidence, to become outright misrepresentation.

In short, the burden of my critique is that the treatment of the question of race, heredity, and IQ in *The Bell Curve* is so selective, eccentric in interpretation, and factually incorrect that it could not be published in any reputable journal. In his article, Mr. Murray responds to these assertions only by attempting to discredit my statement that there is a large literature showing effective intervention with infants which is not subject to the criticisms in the Herrnstein and Murray book, and which shows substantial IQ gains.

Since I give only one example of this literature, Mr. Murray writes as if only one exists. He asserts that the large gains reported for this study did not persist past age three, when Iq's are still unstable, and that the gain at age five had declined to a mere 2.5 points. Once again, he is trying to make the data say what he wants them to say rather than what they actually say. The 2.5 figure refers to the entire sample including an unusual group of very low-birth-weight infants. The near-normal-weight infants in the sample gained 4 to 6 points, or rather retained them because the intervention ended two years before the children were five years old, and the gain was even higher for children born to mothers with little education. These data are highly encouraging and entirely in line with the rest of the literature on normal-weight infants.

Most of your readers will have recognized the shrill and panicked nature of much of the reaction to the Herrnstein and Murray assertions about race and IQ. This is likely to create in any

dispassionate person the presumption that that someone's ox is being deservedly gored. The hysterical response to *The Bell Curve* is, in my opinion, the major reason the book is being paid any attention on the question of race and IQ. The scholarly critiques that will be coming out in the years to come will show how terrible the science in the book is. In the meantime, a great deal of damage has been done--to rational policy discussion and to relations of trust between blacks and whites.

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Michigan

To The Editor of Commentary:

... In "'The Bell Curve' and Its Critics," Charles Murray argues that criticisms of the Herrnstein/Murray measure of background effects in the form of a weighted average of the education, occupation, and income of parents (called SES or socioeconomic status) are unfounded. He asserts that he and Herrnstein "deliberately constructed an SES index that uses the same elements that everybody else uses" and "throws down a challenge ... to come up with another means of measuring the environment."

Readers unfamiliar with the research literature on the effects of social environment on individual achievement may assume that Mr. Murray accurately describes the current state of research in this field. In fact, nothing could be farther from the truth. Measuring social background using only occupation, education, and income of parents characterizes only the earliest studies of the late 1960's and early 1970's. Since then a vast body of work has appeared in the leading academic journals of economics, sociology, and child development in which more subtle and sophisticated methods of assessing social-background effects have been put forward. Even a cursory examination of this work would reveal that Mr. Murray's "challenge" to professional social scientists--that we "come up with another means of measuring the environment"--has long since been met.

Characterizing how social environment impacts on individual achievement is a difficult and complex process. A central aspect of this difficulty involves identifying whether or not a particular correlation--say, between a youngster's churchgoing and her subsequent avoidance of early pregnancy--reflects a "causal" relationship, or is merely an artifact of some unmeasured factor which influences both churchgoing and early child-bearing (e.g., intensity of parental supervision). Attention to this kind of difficulty is what separates high-quality professional work in the field from the more pedestrian efforts.

Thus, contrary to Mr. Murray's claim that the book uses the same SES index that everyone uses, the literature of the effects of social background on children's academic achievement has identified a long list of factors which significantly influence the outcomes for children.

These factors include: (1) peer influences in the form of perceived peer education plans; (2) parental expectations and aspirations for their children's schooling; (3) the income and racial composition of the community of origin; (4) the amount of time mothers spend in the labor market; (5) family structure--two parents versus a single parent, and whether parents are separated or divorced; (6) number of siblings and birth order; (7) religious denomination and church attendance; (8) grandparents' schooling; (9) age of the mother at birth; (10) measures of the quality of stimulation found in the home environment, including emotional and verbal responsiveness of the mother, provision of appropriate play materials, time and quality of maternal involvement with the child parental instigation of and participation in intellectual activities, parental affection, rejection, and nurturance ... etc.; (11) language spoken at home; (12) discussions about college plans with teachers and other school officials; (13) parental emphasis on self-direction versus conformity; (14) ethnicity and immigrant status; (15) parental involvement in school activities; and (16) parental wealth and receipt of welfare income.

This long list is hardly exhaustive. I enumerate at such length only to stress how grossly inaccurate is Mr. Murray's assertion that, by including their simple index of parents' education, occupation, and income, he and Herrnstein were using "what everybody else uses."

A list of the researchers who have contributed to the statistical analysis of various bodies of data in an effort to identify how social background, broadly construed, affects academic achievement would include scores of names and read like a "who's who" of the fields of applied economics, sociology, and child psychology. The same is true of the other dimensions of achievement which Herrnstein and Murray investigate in *The Bell Curve*--poverty, welfare dependency, criminal behavior, parenting effectiveness, etc.

Finally, as a professional economist working in this area, I am taken aback by Mr. Murray's insinuation that academic investigation of the effects of social background on offspring's achievement has been somehow stunted by the purported liberal political commitments of researchers in this field. Contrary to Mr. Murray's claims, we do not all think alike. I often find myself at odds with more liberal colleagues on policy questions. What I share with these colleagues, though, are a commitment to using the appropriate techniques of investigation and a reliance on peer review and critique before putting research findings which bear on important matters of policy in the public domain. Reading *The Bell Curve*, and now Mr. Murray's response to his critics, makes me wish that this commitment were more widely shared.

There is a nearly universal consensus among professional analysts who have reviewed Herrnstein and Murray's statistics that they grossly underestimate the relative effect of environment versus intelligence in accounting for individual differences in various dimensions of achievement. It is genuinely puzzling that Herrnstein and Murray failed to include a richer array of background factors in their analysis, since many of these items were unavailable in the data set they employed. Studies now going on and using the same data (e.g., one by Jonathan Crane of the University of Illinois) suggest that these richer measures of social background may

account for much of the racial gap in cognitive test scores.

Thus, in his response to critics, Mr. Murray is calling on the experts to do what we have, for many years now, already been doing while leaving us no credible explanation for why he and Richard Herrnstein failed to do it themselves.

LINDA DATCHER LOURY Tufts University Medford, Massachusetts

To The Editor of Commentary:

Given the motivations of the critics of The Bell Curve, Charles Murray's compendious and lucid response will not silence them. TO suggest that individuals and groups may differ in innate abilities, specifically intelligence, and that these differences are not reducible to socioeconomic causes, or entirely malleable, inevitably draws a hysterical response from dogmatic egalitarians who believe that au fond all men must be "created equal" in a far more literal sense than jefferson ever dreamt of. Those in the media, literary intellectuals, and academics accept as common sense the para-Marxist view propagated- in sociology courses that life chances differ according to the economic class into which one is born. (Although dead elsewhere, Marxism leads a merry afterlife in academe.) ...

But The Bell Curve proves that life chances depend far more on one's cognitive ability than on one's class and, worse, that cognitive ability is mostly the cause rather than the effect of one's position in life. Class, the wealth or poverty of one's parents, matters far less than one's IQ, which largely (about 60 percent) is an independent variable.

Much of the negative reaction to The Bell Curve can be attributed to the fact that its conclusions are inconsistent with what is taught in sociology courses and with what, wittingly or unwittingly, is accepted by most literary intellectuals. It is much easier to repudiate The Bell Curve than to part from the egalitarian dogma and notions which hitherto have explained everything.

ERNEST VAN DEN HAAG New York City New York

To The Editor of Commentary:

Charles Murray is correct when he states in his article that he and Richard Herrnstein downplayed the evidence for the genetic basis of ethnic/race differences in cognitive ability (including the very high IQ of Jews). They even equivocated on whether the term "race" can be applied to African-Americans who may be more "white" than "black," genetically speaking....

Researchers like me are greatly indebted to The Bell Curve (and its critics) for getting the "genie out of the bottle," i.e., the idea that individual and racial differences are due, at least in part, to

genetic differences. Human differences can be fully understood only in a wider (evolutionary) context. Such understanding will show why the "American dilemma" is international in scope.

J. PHILIPPE RUSHTON University of Western Ontario London, Ontario, Canada

To The Editor of Commentary:

Charles Murray has once again demonstrated why he is among the most perceptive social scientists and social critics in America today (along with James Q. Wilson and Peter L. Berger). The incredibly hostile reception accorded *The Bell Curve* would have thrown a lesser person into paroxysms of vituperation. Instead, Mr. Murray coolly and clinically diagnoses the causes and foresees some of the consequences of the hysterical treatment his exemplary study has provoked.

The Bell Curve (like its predecessor, *IQ in the Meritocracy*, by Mr. Murray's co-author Richard J. Herrnstein) simply draws inferences from the disparities in intelligence that are readily observable among individuals and groups. That these inferences are not conducive to utopian designs for society is, as Mr. Murray contends, a wholly "modest" finding.

What is so infuriating is the abuse to which Mr. Murray has been subjected. It is one thing to attempt to refute his arguments; quite another to assassinate his character by impugning his motives, sources of funding, and even his high-school pranks of decades ago. I cannot for the life of me understand why some of the most respected scholars in the country stoop to ad-hominem attacks. It is one thing for TV talk-show host Phil Donahue to violate elementary canons of civil discourse by accusing Mr. Murray, without any justification, of having been proto-Nazi in adolescence. It is quite another for Harvard scientist Stephen Jay Gould to make only slightly more sophisticated but equally spurious and damning allegations.

I have watched in despair as Christina Hoff Sommers, Michael Levin, Carol Iannone, Steven Goldberg, Elizabeth Fox-Genovese, Thomas Sowell, and dozens of other first-rate scholars have been vilified for following where evidence and logic lead. Without minimizing their suffering, I would say that Charles Murray has been the subject of an academic inquisition which is without parallel in recent memory. It makes me ashamed of my profession to realize that smear tactics are the weapons of choice in the battle over ideas for people trained and paid to lead a "life of the mind." Truly, in the words of Thomas Jefferson, "I weep for my country when I reflect that God is just."

LLOYD B. LEWIS Savannah College of Art and Design Savannah, Georgia

To The Editor of Commentary:

I write to corroborate, by way of personal anecdote, Charles Murray's proposition that "the

critics of The Bell Curve are going to produce the very effects that their attacks have been intended to avert."

Shortly after the book's publication I was invited to attend a lecture at MIT. Neither the topic nor the speaker was specified, but I inferred that the subject was significant and the speaker's reputation weighty along the Cambridge corridor.

I arrived at the overfilled lecture hall with my critical canvas a tabula rasa: I knew of Stephen Jay Gould (the speaker, it turned out) only vaguely; I knew of Charles Murray (part of the topic) even more vaguely; I knew of The Bell Curve (the balance of the topic) not at all. I was an innocent.

If I harbored any expectation, it was that I would be exposed to reasoned, objective, critical, and informative discourse, based on sound scholarship. What I was exposed to instead was an academic hour of arch, snide, and conclusory attack on a book and its absent authors.

Perhaps with some residual respect for the newly deceased Richard J. Herrnstein, Gould concentrated his sharper ad-hominem weapons on Charles Murray. Directly and indirectly Gould made him out to be an intellectual lackey ... of the far Right, which, ... to Gould's correct-thinking audience, meant that he and his work were probably infected with racism. In Gould's view, Mr. Murray's scholarship was, of course, flimsy, based on discredited psychometrics, the antediluvian g, and the outmoded IQ concept. Using clever innuendo, as well as facial expressions and patronizing chuckles to indicate his far-superior intellect, Gould left little doubt as to the charlatanry of the authors....

At the end of Gould's talk, I felt I had not heard a critical lecture on behavioral science but a sermon on theology, complete with a postmodern edict of excommunication....

In the weeks that followed, the deluge of equally vitriolic reviews directed at The Bell Curve confirmed my impression that much more was at work here than the disputation of scholars. What I was witnessing was a jihad in which Charles Murray was the infidel....

It has been intellectually refreshing finally to encounter in the pages of Commentary the real Charles Murray rather than a devil-person. I can now explore both sides of a legitimate question Stephen Gould so decidedly intended to remain unexamined.

W.H. RYAN LaConner, Washington

Charles Murray writes:

I am grateful for the letters from Ernest van den Haag, J. Philippe Rushton, Lloyd B. Lewis, and

W.H. Ryan. But I must pass up further comment on these letters to focus on the critical ones from James J. Heckman, Charles Lane, Leon J. Kamin, Richard E. Nisbett, and Linda Datcher Lounsbury.

In "'The Bell Curve' and Its Critics," I discussed four issues that have been the subject of intense attack: the idea of a general factor of mental ability; the possibility that genes play a part in ethnic IQ differences; the statistical power of the results reported in *The Bell Curve*; and the attempts to raise IQ through program interventions.

James J. Heckman's letter deals primarily with issues involving the general factor of mental ability "The basic premise of the book," Mr. Heckman writes, "is that g--or a single factor of intelligence--explains behavior, and that it is immutable." But this characterization, which provides the rationale for the criticisms in his letter and for much of his longer critiques of *The Bell Curve* published elsewhere, constitutes a straw man that bears no resemblance to the spirit or content of the book. At no point do the late Richard Herrnstein and I hint that IQ is an all-powerful determinant of behavior, or that IQ is immutable.(1)

Let me offer some examples of our plainly stated view on these issues.

Although we regard intelligence as helping to "explain" behavior in a statistical sense, we repeatedly emphasize how much IQ scores leave unexplained. In the introduction, when we first describe our view of intelligence, we conclude with this passage:

All of this is another way of making a point so important that we will italicize now and repeat it frequently throughout the book: measures of intelligence have reliable statistical relationships with important social phenomena, but they are a limited tool for deciding what to make of any given individual (p. 21).

On page 68, after displaying a scatterplot of two variables with a correlation of .33, we again put our message in italics to make it hard to miss: For virtually every topic we will be discussing throughout the rest of the book, a plot of the raw data would reveal as many or more exceptions to the general statistical relationship, and this must always be remembered in trying to translate the general rule to individuals.

And in the introduction to Part II, opening the analyses of the relationship of IQ to social behaviors:

High cognitive ability is generally associated with socially desirable behaviors, low cognitive ability with socially undesirable ones. "Generally associated with" does not mean "coincident with." For virtually all of the topics we will be discussing, cognitive ability accounts for only small to middling proportions of the variation among people (p. 117).

When Mr. Heckman further writes in his letter that ". . . many skills affect outcomes and not all can be equated with native intelligence," may I suggest that we said exactly the same thing?:

Perhaps a freshman with an SAT math score of 500 had better not have his heart set on being a mathematician, but if instead he wants to run his own business, become a U.S. Senator, or make a million dollars, he should not put aside those dreams because some of his friends have higher scores. The link between test scores and those achievements is dwarfed by the totality of other characteristics he brings to his life (p. 66).

In the light of such statements, I only wonder how Mr. Heckman, a careful scholar, can write, "Once [the role of many skills] is recognized, a core argument in *The Bell Curve* evaporates."

Mr. Heckman is equally wrong about our position on the immutability of intelligence. In the introduction we state, as one of six general points well-established in the literature, that "IQ scores are stable, although not perfectly so, over much of a person's life," adding immediately that "All six points have an inverse worth noting. For example, some people's scores change a lot . . ." (p. 23). With regard to actual changes in intelligence, we credit the establishment of universal education with having major effects on intelligence (pp. 396-97, 589-592); similarly with adoption at birth (pp. 411-13). With regard to other potential means of changing intelligence, we are more aggressive: "Limitless possibilities for improving intelligence environmentally wait to be uncovered by science.... In principle, intelligence can be raised environmentally to unknown limits" p. 390). This is not the work of authors who believe that intelligence is immutable.

In the last two lines of his letter, Mr. Heckman makes two large statements: first, that one of the measures of intelligence we use is really an achievement test, not a test of mental ability; and second, that it can be manipulated. The test he refers to is the Armed Forces Qualification Test (AFQT).

Concerning the AFQT as a measure of intelligence: all IQ tests are designed for a reference population. In the case of the AFQT, that population is people in their late teens who have been exposed to the American school system. But the fact that items on a test depend on some past education does not necessarily mean that the test is no longer a measure of general intelligence. The brief story, told at length in Appendix 3 of *The Bell Curve*, is that the AFQT is one of the most highly g-loaded tests in current use.

Would *The Bell Curve*'s results have been different if we had access to one of the many other standardized mental tests? Unlikely. The AFQT is more highly correlated with other major IQ tests than other major IQ tests are correlated with each other (pp. 584-85).

Can the AFQT scores be manipulated? Yes--on the computer, by econometricians using complex statistical models. What about by school administrators and teachers trying to keep

someone in school for another year to raise his AFQT score? Not much; but more on this below.

As for Mr. Heckman's statement that I cite John Carroll's work misleadingly, I can only say that it will come as a surprise to Carroll, who at my request reviewed and approved my citation of his work.

Charles Lane, Leon J. Kamin, and Richard Nisbett all weigh in regarding genes and ethnic differences in intelligence.

Mr. Lane is shocked and horrified that I cite scholars who have received funding from the Pioneer Fund. The one paragraph I devoted to the subject in my article was not intended to rebut his allegations but to express my disdain for them. As I have written elsewhere, the attempt to discredit a book at third hand--by tracing the funding history of some of the scholarship it refers to--is a form of McCarthyism. I do not choose that adjective lightly.

In that sense, I also do not care whether Lane's accusations about the history of the Pioneer Fund are true, although I have read enough of the Pioneer Fund's side of the story to doubt them. To me, the key point is that for some decades the Pioneer Fund has given money to legitimate scholars to work on topics, of legitimate scientific inquiry, and it makes no attempt whatsoever to influence the course of that work.

As for the sources themselves in *The Bell Curve*, the one criterion Herrnstein and I followed was whether the work had scientific merit, and was relevant to our presentation. So let us examine Mr. Lane's and Mr. Kamin's charges on that count.

As a preliminary, let me take up Mr. Kamin's complaint about the logic linking African IQ the legacy of slavery, and African-American IQ, and simply say that the logic he finds objectionable is not ours. Our strategy in Chapter 13 was to answer all the common questions about ethnic differences in intelligence. In the course of writing the book, it quickly became apparent that many people assumed scores of blacks in Africa would be higher than scores of blacks in the U.S., on the theory that colonialism or apartheid was less destructive than the legacy of 250 years of slavery. We did not try to assess the relative oppressiveness of these systems; we simply told readers that such expectations were wrong. African IQ has been found to be substantially lower than African-American IQ.

How valid are the studies that show African scores on mental tests as markedly low? Richard Lynn, a careful scholar who has been the target of almost as much unwarranted criticism as J. Philippe Rushton, converted scores on the existing studies of African cognitive ability to IQ scores, and found that they fall in a range from the 60's to the 80's, with a mean of about 70 and a median of 75.(2) His rationale for converting the scores is defensible but also unnecessary to his argument. One may instead use standard deviations or percentiles to make the same case: the African mean on cognitive tests is in the region of two standard deviations below the white

mean, or somewhere below the fifth percentile of the white or European distributions on the same tests.

Might it be, as Mr. Kamin argues, that these studies are invalid because the tests were administered to illiterates, or to Africans who could not be expected to be familiar with culturally specific bits of information; No. The largest and most careful of the studies have sometimes been limited to urban populations, to persons who have graduated from middle school, to students still in school at the secondary level, or to employed persons. Such samples may if anything tend to overestimate, not underestimate, the national mean by overloading the sample with persons who have had the ability and persistence to remain in school or hold jobs.

Many of the best studies have also used Raven's Standard Progressive Matrices (SPM), which is an excellent measure of the nonverbal component of IQ, is highly g-loaded, and is not bound by culturally specific information. Does it help to have been in school to do the SPM? Probably--and the samples in the best African studies have been students in school.

To illustrate how troubling the results have been, let me turn to two studies postdating Lynn's review. One, from South Africa, was led by Kenneth Owen (not the study mentioned by Mr. Kamin). The results were published in the refereed British journal, *Personality and Individual Differences*.⁽³⁾ Its sample consisted of enrolled seventh-grade students and included 1,056 whites, 778 "coloreds" (mixed-race), 1,063 Indians, and 1,093 blacks. The SPM was administered without time limits. Except in the case of the Indians, subjects were tested by school psychologists of the same ethnic group.

Owen presents the full psychometric profile for the test results (distributional characteristics, reliability, item difficulty, item discrimination, congruence coefficients, and discriminant analysis), demonstrating that the test did indeed measure the same thing in each of the various ethnic groups. The discrepancies in mean scores? Expressed in standard deviations, they were as follows: Indian-white: $-.52$; colored-white: -1.35 ; black-white: -2.78 . This black-white difference is larger than Lynn's earlier estimates.

The second recent study was conducted by a black scholar, Fred Zindi.⁽⁴⁾ It took 204 black Zimbabwean pupils and 202 white English students from London inner-city schools and matched them according to age (12-14), sex, and educational level; both samples were "working-class." Despite the fact that the white sample was well below average for whites, with a mean IQ--as measured by the test known as WISC-R--of only 95, the difference between whites and blacks was 1.97 standard deviations on the SPM and 2.36 standard deviations on the WISC-R. Mr. Zindi reported these as IQ's of 72 for the SPM and 67 for the WISC-R--consistent with Lynn's earlier estimates. (There is reason to think that the WISC-R score was somewhat depressed by language considerations, but not much.)

What should one make of these results? Above all, we must proceed cautiously, for the same

reasons that guided us in *The Bell Curve*. Our view was that the differences between groups will narrow over time, probably dramatically, as nutrition and the quality of schools improve for black Africans. Changes in black African culture may also provide an environment more conducive to cognitive development among young children. But that does not mean that the current differences, as measured through these samples, are figments of the imagination, or that differences in test scores do not represent real differences in cognitive functioning. They do, and those differences are extremely large, much larger than the differences separating American blacks and whites.

You may choose to believe that Owen is a white racist who wittingly or unconsciously rigged the results, although his scholarly reputation belies it. (Zindi would seem exempt from the same charge.) You may choose to believe that the poor black performance is itself a consequence of colonialism and apartheid and will soon vanish. But these are just assumptions. When data are as carefully collected and analyzed as these, attention must be paid.

RICHARD E. NISBETT takes a different tack, focusing on studies in the American context. He begins by complaining that Herrnstein and I discussed only one of seven studies that bear on racial ancestry at sufficient length to suit him. We alluded to two others, he acknowledges, but dismissively. Here, however, is our sentence evaluating one of them: "The study is inconclusive but certainly consistent with the suggestion that the B/W [black-white] difference is largely environmental" (p. 310). Of the other, we wrote:

If the whites who contributed this ancestry were a random sample of all whites, then this would be strong evidence of no genetic influence on black-white differences. There is no evidence one way or the other about the nature of the white ancestors (p. 729).

These sentences sound to me like the phrasing of careful social scientist trying to give as much credit to studies as the data warrant. What does Mr. Nisbett find unjustifiably dismissive in either of them?

In his letter, Mr. Nisbett does not cite the remaining four studies, but in his article in *The Bell Curve Wars* he cites studies from before 1975 that are also discussed in a book by John Loehlin, Gardner Lindzey, and J.N. Spuhler. Here is what we said about these studies in *The Bell Curve*:

Several smaller studies bearing on racial ancestry and IQ were well summarized almost two decades ago by Loehlin, Lindzey, and Spuhler. They found the balance of evidence tipped toward some sort of mixed gene-environment explanation of the B/W difference without saving how much of the difference is genetic and how much environmental.

If Mr. Nisbett is going to claim that we misled our readers by skipping over literature we did not like, he must show that we misrepresented Loehlin, Lindzey, and Spuhler's review of the evidence; or that their conclusions were themselves wrong; or that some decisive change in their

evaluation has been prompted by subsequent work. He does none of these things, instead offering a one-sentence summary of the (unspecified) literature. I submit that our one-sentence summary is more balanced and prudent than his. Interested readers with access to a university library can look up Loehlin, Lindzey, and Spuhler, Chapter 5, and decide for themselves.

Mr. Nisbett is correct, however, in saying that we devote most of our attention to one study, known as the Minnesota Transracial Adoption Study. Why? Because the Minnesota Transracial Adoption Study was for more than a decade Exhibit No.-1 for optimists on the nature of black-white differences, and was widely cited as close-to-definitive empirical proof that such differences in intelligence were environmental.

As it happens, the early data from the Minnesota Transracial Adoption Study were not as unambiguously positive as they were often reported to be in the press.(6) At age seven, the scores of the black adoptees were below those of the white adoptees, and even further below those of white biological children of the adoptive parents. Still, the mean of the black and interracial adoptees was 106; which was not only higher than the Minnesota black mean of about 89 but higher than the national white mean. This was good news by any standard.

In the late 1980's, however, when the same children were tested in adolescence, the IQ means were as follows: 109 for the biological children of white parents; 106 for the adopted white children; 99 for the adopted children with one black biological parent; and 89 for the adopted children with two black biological parents.(7) As we put it in the book: "The bottom line is that the gap between the adopted children with two black parents and the adopted children with two white parents was 17 points, in line with the B/W difference customarily observed" (p. 310). This is bad news by any standard.

If the national black-white difference is in the region of 15 points, and if, after growing up in white homes, adopted black children still are just as far behind, then the first, parsimonious explanation of such differences must be that they are largely genetic. I have no problem with the attempt of the authors of the Minnesota study to search for alternative, environmental explanations for the results, which Mr. Nisbett cites enthusiastically. Thus, when those authors--Richard Weinberg, Sandra Scarr, and Irwin Waldman--came to offer conclusions, they wrote:

The results of the longitudinal follow-up continue to support the view that the social environment maintains a dominant role in determining the average IQ of black and interracial children and that both social and genetic variables contribute to individual variations among them (p. 133).

Other scholars argue (as Herrnstein and I thought) that Weinberg, Scarr, and Waldman retreated too far from parsimony, trying too hard to squeeze the last ounce out of an environmental explanation. But here is the key point: this is an ordinary scholarly difference of opinion, bounded by common agreement. Weinberg, Scarr, and Waldman acknowledge that their data

indicate that some genetic component is probably involved--as indeed their data make it very hard to deny.

I have rehearsed the African IQ data and the Minnesota Transracial Adoption data at such length because, in the letters printed above as in the published reviews of *The Bell Curve*, our discussion of the possibility of genetic racial differences in intelligence has been attacked so relentlessly. What has all the fuss been about? Let me, for the umpteenth time, repeat our concluding paragraph here:

If the reader is now convinced that either the genetic or environmental explanation has won out to the exclusion of the other, we have not done a sufficiently good job of presenting one side or the other. It seems highly likely to us that both genes and environment have something to do with racial differences. What might the mix be? We are resolutely agnostic on that issue; as far as we can determine, the evidence does not yet justify an estimate (p. 311).

At present, this is the scientifically prudent position.

One final aspect of the black-white difference is raised by Mr. Nisbett, who claims that I continue to refer to a black-white gap of 15 IQ points while our own account in *The Bell Curve* reveals a median current gap of only 9 IQ points. "Herrnstein and Murray's description of these data goes beyond dubious analysis, beyond irresponsibly selective choice of evidence, to become outright misrepresentation of a state of affairs."

Mr. Nisbett has it exactly wrong. Far from ignoring evidence of convergence, Herrnstein and I were, if anything, guilty of downplaying important evidence that the current black-white gap is not closing at all but diverging, and that the actual current gap is not just 15 points, but some larger figure.

Mr. Nisbett's use of a 9-point gap comes from our review of recent IQ test data (pp. 289-90) as reported in an article by Ken Vincent.⁽⁸⁾ There, Vincent argued that studies of children in the 1980's indicate a smaller difference than is observed among adults. But (a familiar story) the studies Vincent used are beset by problems of interpretation: unrepresentative samples, results that in the technical literature are said to be artifactual, and, in five of the studies, a control for socioeconomic background that is guaranteed to reduce the black-white difference by about 40 percent. Nonetheless, we called Vincent's evidence encouraging, as indeed it is.

But another, much larger source of data on the black-white difference among today's children, not used by Vincent, is also available. Every two years since 1986, the children of the women in the National Longitudinal Study of Youth (NLSY) have been tested on the Peabody Picture Vocabulary Test, a nationally normed and widely used measure of child IQ. When we wrote *The Bell Curve*, we had access to the data through the 1990 testing cycle. We alluded to it at the end of our review of Vincent's data, and presented the actual numbers in Chapter 15. Restricting the

comparison to pairs of mothers and children who had been tested, we reported the gap separating the black and white mothers as 13.2 IQ points, while the gap separating the children was 17.5 points. We also said that "There are technical reasons to hedge on any more specific interpretation of these data" (p. 356).

I have looked since then at the data through the 1992 testing cycle. The same trend persists, even after correcting for the ways in which current samples are unrepresentative. Nor should it be surprising that the NLSY is yielding these results. They are consistent with the expectations one may draw from the national birth data, which show a marked black-white divergence in births based on educational level of the mother (which in turn has a reliable correlation with maternal IQ).

There are still reasons to hedge on what will eventually happen to the black-white difference, but the notion that the balance of the data demonstrates a brighter future, let alone only a 9-point difference, ignores reality. The Bell Curve's summary of the situation struck the right note, I think:

Many of you will be wondering why we have felt it necessary to qualify the good news [on convergence of scores!]. A smaller number of readers who specialize in mental testing may be wondering why we have given so much prominence to educational achievement trends and a scattering of IQ results that may be psychometrically ephemeral. The answer for everyone is that predicting the future on this issue is little more than guesswork at this point. We urge upon our readers a similar suspension of judgment (p. 295).

In "'The Bell Curve' and Its Critics," I argued that the book undermined the importance of socioeconomic background (SES) as an explanation for social outcomes. Linda Datcher Loury takes me to task for not acknowledging a large and expanding literature on the many factors other than traditional measures of SES that are known to affect such outcomes.

Her criticism is not without merit, but also not entirely on point. I did not argue that no one has explored other factors. I pointed out, rather, that (1) SES has for many years been a staple in academic analyses of why children of some families become poor, why they drop out of school, why they commit crimes, etc.; (2) a major purpose of *The Bell Curve* was to add IQ to this standard set of explanatory variables; (3) our use of SES has come in for much frivolous criticism; and (4) *The Bell Curve* has diminished the persuasiveness of the role of SES in explaining social problems. Nothing in Mrs. Loury's letter disputes the last three points. As for the first, does she really want to contend that in academic treatments of poverty, welfare, crime, and other social pathologies discussed in Part 11 of *The Bell Curve*, socioeconomic background has not (along with racism) been the dominant explanatory construct since the 1960's?

But Mrs. Loury is quite right that I should have acknowledged the growing literature on other explanatory variables. When I write about this issue in the future, I will amend my presentation

accordingly.

The final topic in my article was my prediction that the attacks on The Bell Curve will backfire by forcing policy-makers to confront just how difficult it is to make substantial, long-term improvements in cognitive functioning. As promised earlier, I will now return to this point.

Here, again, Herrnstein and I are accused of dismissing studies we did not dismiss. In this case, Richard Nisbett cites two studies of intervention in infancy "both of which had very positive results but which they reject on methodological grounds." He refers to the Milwaukee Project and the Abecedarian Project. This, to be tiresome about it, is what we actually wrote:

In summary, the two experiments contain some promising leads. But it is not obvious where to go from here, for they differed in possibly important ways. The Abecedarian Project evaluated day care; the Milwaukee Project provided numerous interventions besides day care, including parental payment and training. It is hard to tell whether the former found enduring IQ benefits, given the very early divergence in test scores for experimental and control groups, but it found some academic benefits; the latter found an enduring IQ gain, but it has not yet shown comparable intellectual gains in school work (p. 409).

This is what he calls a rejection? Is he prepared to claim more for these two projects than we did?

Mr. Nisbett also asserts that we "ignore a dozen studies not subject to such [methodological] criticisms but having results consistent with the two they reject." Once again he has wrongly accused us of ignoring studies that we covered, in this case using the respected synthesis of the literature conducted by the Consortium for Longitudinal Studies.⁽⁹⁾ Overall, the Consortium found about a 7-point gain in the exit test for such interventions, a gain that faded out within a few years. In the end, concluded the Consortium, "The effect of early education on intelligence test scores was not permanent."

In the next part of his letter Mr. Nisbett refers to a variety of interventions that conflate improvements in educational instruction and achievement (which neither Herrnstein nor I would dispute) with improvements in cognitive ability. This distinction is crucial, however. Do we know how to take a set of youngsters with a given tested IQ and reliably improve their educational achievement? Yes. Do we know how to take a set of youngsters with a given tested IQ that would not (for example) allow them to become engineers, and reliably raise their cognitive functioning so that they can become engineers? No. Do we know how to sustain gains in IQ if we sustain the enriched curriculum? Mr. Nisbett says that we do. In my article, I observed that we have no credible study offering evidence of significant, long-term effects on cognitive functioning that Herrnstein and I did not consider in *The Bell Curve*. I am still waiting for a citation. Mr. Nisbett offers none.

I grant that he is one-twelfth correct when he complains of the dozen studies we failed to consider in *The Bell Curve*. The eight-site study he mentions, in which preschool, social, and pediatric services were supplied to low-birthweight (less than 2,500 grams) children, however. Do we know how to take a set of youngsters with a given tested IQ and reliably improve their educational achievement? Yes. Do

Ethics and the Social Sciences - The Beyondist Solution

RAYMOND B. CATTELL

Several years ago (1948) I was moved to write in the *American Psychologist* an article challenging the naive and dangerous manner in which many social scientists indiscriminately mixed their personal political and religious values with their more scientific conclusions. Andreski (1972) has illuminated the same problem.

Criticism of such skullduggery is not enough. There must be a constructive solution if social sciences are to be applied, and so with progressive clarification (1938, 1944, 1950, 1972) I have sought to develop what might claim to be a system of ethics of the same metal as science itself. Naturally this ethic asserts that the new wine of science in human thought cannot safely be kept in the old bottles of "revealed" religion, and that the duality of knowledge of fact and values, beloved of many philosophers from Kant to Russell, must be abandoned.

That the ethical basis of morality should have been linked with religions throughout history is a natural consequence of the fact that religions had the function of answering the basic questions "Where am I?," "What am I?," and "What therefore ought I to do?" World views and moral values logically belong together. So if science in the last few hundred years has given clearer answers to "Where and what am I?," it is time it also gave answers in the field of human values.

Need for an Evolutionary Ethic

The search in the domain of science for a foundation leads one to the largest writing on the wall: that recognizing the pervasive principle of inorganic and organic evolution. For an ethics derived from evolution one might be tempted to use a label such as Progressivism or Human Betterment or Advance; but I adhered to Beyondism for reasons that will become clear. They have to do with the difficulty of objectively defining progress, and the possibilities of diverse directions of progress, so that what remains essential is a spirit to adventure beyond existing horizons.

Three indispensable, central concepts have to be defined and used in accepting evolution: 1) that there must be genetic and cultural variation; 2) that it must be followed by natural selection for adaptation. (Genocide by man is questionable; but with the actions of genocide by nature we must be in harmony); and 3) that both have their meaning with regard to a given or potential environment. Among secondary principles we have to recognize that natural selection acts both upon individuals and groups. The operation of natural selection upon groups may in lower animal species be little more than a summation of selection on individuals. But in complex human societies it is responsive to emergents beyond the individual in the pattern and organic life of the group. Thus, while it still acts on individuals as such, one must recognize also the

truth that individuals, regardless of their own characters, live or perish with the culture-genetic group to which they belong.

In asserting that much selection operates on groups Beyondism is apt to get spattered with the torrent of ink that flows over a "philosophical" debate on "the relative importance of the individual and the group" which has centered particularly on Hegel's apotheosis of the group versus the Christian belief in the importance of the individual. In an evolutionary setting this issue becomes as pointless as seeking the relative importance of the hen and the egg. One must at least accept Hobbes' dictum about the poverty of development of the "isolated savage," and recognize that the most brilliant Nobel Prize winning chemist would be inglorious, if not mute, living without his apparatus in a mud hut. Natural selection must act primarily upon groups as such, because the type of individual is needed whose development requires a group and who contributes to a successful group.

Natural Selection Works on Societies Also

So long as men live in societies, by reason of such organizations being biologically more viable than amorphous collections of anarchic men, natural selection will eventually come to act largely on societies. Those societies will have higher survival rates whose members follow ethical rules akin to the ten commandments, calculated to keep the group in being, and whose level of individual altruism reaches a sufficient level of suprapersonal dedication to the life of the group. The rules which best meet this need have hitherto been intuited by religious geniuses, but with the modern advance of the social sciences, with measurement and mathematical models, it should be possible, proceeding through empirically based laws, to infer those behaviors in individuals that best assure group survival. Ethics would then no longer be the perquisite of dogmatic religion, nor the plaything of modern moral relativism, but would take its place as a firm branch of science, though open to debate and fresh experiment as all science is. Parenthetically that could do much for our present ills - rising crime, drug addiction, violence and -pointlessness, which are no longer, in a prosperous age, to be smugly ascribed to evils of poverty and lack of education, "but surely arise from the demolition of the authority of revealed religion in the last century.

The conception of a rationally based ethics is, of course, far from new. The Priestley-Comte-Bentham-Mill-Spencer line of development, in most of which "the greatest happiness of the greatest number" was the accepted social target for inferring the courses of individual behavior, had its successes in legislation and in liberal thought. However, it is generally recognized today that this rationalist ethic failed to establish itself with either the common man or the philosophers. It probably failed with the former because it did not reach into his life, the social "sciences" then being unable to demonstrate what ethical rules would reach the given goal, in the way that an electrician can tell us what will make a TV set work. It failed with the philosopher because the goal had no precision, "units of pleasure" or happiness being hard to define. From a Beyondist standpoint it failed in a still more crucial sense: that it chose the goal

subjectively, as appealing to the simple mind of the reformer, rather than discovering the goal by scientific research into the system of nature to which man belongs. The goal of the Utilitarians witnesses mainly to the kind hearts of nineteenth century liberals and their continuation of the vain thinking of the French Enlightenment pure reason without science. Indeed, the whole pattern of pre-biological, pre-Darwinian political thought is evident still in the obsolete, staunchly conservative thinking of the "liberal" intelligentsia today.

The contribution of Bentham and Mill was that at least they broke the crust of inhibition, imposed by established custom and religion, thus leading to a consideration of ethical values derived from other sources than revealed, inspirational, dogmatic religion. However, no tour de force such as some have proposed, e.g. including the happiness of future generations in the assessment of "the greatest happiness of the greatest number," can reconcile the comfortable, man-encapsulated philosophy of Utilitarianism with the penetration of a stark outer space which is the essence of Beyondism.

From the basic proposition above, that variation and natural selection act upon societies, we must now move on to examine the next proposition: that natural selection has to act upon a combination of genetic and cultural characters. In so doing we also recognize that success or failure of a group does not weigh its morality alone, but responds to the primary efficiency and intelligence of the cultural habits and the adaptiveness of the genetic mutations which it has accumulated by acts of nature. However, as eugenists have long argued, man is not helpless in the latter area: he can to some extent control mutation rates and he can be alert to fostering mutations which reduce the culturo-genetic lag i.e. the disparity between what a successful culture demands and what an otherwise haphazard supply of births provides.

In arguing that the advance of cultures proceeds by essentially the same laws of variation and selection as genetic advance we are omitting reference to lesser modifying principles and to complexities which the study of social evolution has not yet mastered. Cultural reformers may have sufficient insight to hit a success rate better than 50-50, but their insight is far poorer than their confidence warrants, and cultural changes come essentially under the same laws of trial and error learning as do gene mutations. However, the survival or non-survival of a group culture is not the all or nothing fate of a biological organism, since cultural elements from it are often imitated and cannibalized by other cultures, with possibilities of wise or unwise choice. And though the extinction of a race commonly brings extinction also of its culture, the extinction of a culture may at most produce only a dwindling of the associated race.

Cooperation of Man With Nature

Obviously the adoption of an evolutionary, Beyondist ethic calls for a cooperation of man with nature in facilitating more intelligently the perceived goals. This calls, for example, for universal cooperation for the protection and encouragement of racial and cultural variation, and an international research organization to promote better measurement, recording, and analysis

of the cultural and genetic experiments proceeding, in order to arrive at understanding in scientific laws. Among those laws would be the ethical laws best suited to cultures in general, with the modifications appropriate and best fitted for each geno-cultural experiment. On the value of such a major comparative central research organization in monitoring the socio-genetic health of communities, and of detecting what is moribund before a society collapses, a little more will be said below.

Morality involves ethical laws both in behavior among individuals and among groups, and since analogous analyses would lead us to expect that these would not be the same, the Beyondist will demand careful study before subscribing to popular views that ideally they should be the same. For example, there may be arguments for reducing competition among individuals in a group, but not for eliminating competition among groups. This and other further analysis of inferences and lesser principles from the basic evolutionary principles can perhaps be most interestingly pursued in handling criticisms that have arisen from the impact of Beyondism on conservative and entrenched political and social opinion today.

In the first place no biologist, and few widely educated psychologists, can fail to have perceived that many sociologists and cultural anthropologists completely ignore genetic factors in culture. They borrow from psychology only a Pavlovian Skinnerian learning theory, not the newer, comprehensive structured learning theory. (Cattell 1979) The assumption is explicit in some, and unexamined in others, that any culture can be grafted with equal ease upon any racial stock. While modern quantitative investigation of this is too rare (Jensen, Loehlin, Lindsey and Spuhler, Lynn) to be invoked, it surely takes a minimum of imagination to recognize that a modern industrial-cybernetic culture could never be taught to and sustained by pre-Neanderthal man - at least by the genetic makeup of the Australopithecoid man with a brain capacity about one half of modern races. And any teacher will recognize that our present subculture of perhaps a thousand physicists practicing advanced nuclear research would vanish if the spread of I.Q. above 110 were cut off. There may well be elastic but real boundaries also in what inherited temperament does to the forms of culture can be stabilized.(1) The sociologist seeking to preserve his pure environmentalist beliefs is apt point out that cultures and genetic or racial groups are so "inextricably" mixed, that no one can argue for any importance in the genes of a population. Actually the fact that races and cultures are not correlationally independent is a powerful argument for some causal dependence. The Beyondist view that both genetics and learning are involved in the formation of a culture is certainly well supported at presently attainable levels of method and analysis by the scholarly writings of Huxley, Keith, Chomsky, Darlington, Lynn, Eysenck, Jensen, Waddington, and others.

Competition Between Groups

The second derivative principle of Beyondism that has met rather similar heated criticism, especially by would-be idealists among the young (bound to the "progressive" slogans of the last generation) is that which requires free competition among groups (and therefore, in certain

ways, within groups). A liberal should have no difficulty in digesting these inferences for it is central in the original liberal economic doctrine of "laissez faire" and free trade. But competition and natural selection raise the spectre of war, and evolution certainly requires that there shall be expansion and retraction of cultures, else there can be no outcome in relative survival. The concept of competition here, however, has two special developments in it, first in what is defined as cooperative competition, and secondly in its avoidance of what may be called explicit, emulative and imitative competition. As to the first, if all groups perceive that they are aiming at a common purpose of human progress, which, because of our blindness, can be achieved only by agreeing to vary- and await the verdict of nature, they have the emotional unity of a cooperative competition. As to the effect of a too-explicit competition we recognize on the one hand that the lilies of the field toil not nor spin, yet evolve, whereas man and some higher animals get involved in warfare, developing burdens analogous to the massive antlers of the stags, or, even worse, beginning to run races along set courses with their minds closed to more creative directions of variation.

After two world wars virtually within a generation objections to competition on the grounds that it engenders war are understandable. Actually, war is no more a desirable or necessary part of competition than fisticuffs and temper tantrums in a football game. If writers in panic argue against competition because of war they need to be reminded that the advance of science or the rise in standard of living should also be halted; for the former makes war more destructive and the latter makes it more prolonged. To reject the indispensable principle of competition because of the risk of degeneration into war is a perfect example of throwing out the baby with the bath water.

What is a necessity for Beyondism - and one difficult for the comfort-loving liberal intellectual to understand - is some mechanism for expansion of successful cultures and retraction of moribund societies. Imitation of successes will not alone guarantee this. Incidentally, the lack of a wisely-evaluating and lawful process for expansion offers a constant threat of war, as surely as screwing the saucepan lid down promises some ultimate explosion. The emotionality which has developed journalistically around such terms as "imperialism" and "colonialism blinds the public to the fact of life. The fashion of making "imperialism" an obscenity should not blind us to the logical necessity in natural selection of ensuring greater population and resources to societies which make a better adjustment to the natural world.

The inherent problem in any attempt at peaceful adjustment in expansion and retraction is the likelihood of hasty and erroneous judgment. We have said that a central world research organization should be supervising what technically might be viewed as an analysis of variance experimental design, with cultural and racial "effects," and if this were sensitively conducted the cautions now inherent in scientific judgments would preclude the hasty enthusiasms of the world for particular cultures. Insistence on the difficulties of such judgments, however, is often a cloak for failure to accept the basic change of values required by Beyondism, namely that cultures and races, like individuals, are born to die. Biologists, counting the records in the rocks,

tell us that no less than about 95% of all once-existing species and races are now extinct, and an historian might reach a similar count for cultures. Journalists may scream against "genocide," but if they include genocide by nature rather than by man, as they apparently do, they are being ridiculous. Nature is concerned with evolving life, not with preserving a living museum of all species, and genocide, like individual death, is the only way of clearing space.

Since one of the main misunderstandings of and attacks upon Beyondism has arisen from its giving equal importance to racial (or genetic) variation and cultural variation alike one must unfortunately take an appreciable digression to disperse this fog of misrepresentation. In the first place an evolutionary experiment today would not be much concerned with the concept of the traditional major geographical races, which are largely the products of geographical isolation and climatic adjustment. It would be concerned instead with specific Mendelian populations or micro-races, with actual breeding populations and the gene pools which they represent. As the study of human genetics advances it will be concerned still more with genetic experiment selective reproduction and the cultivation of mutations - always to be put to the test of health and survival potential.

An aspect of Beyondism which is more seriously in need of consideration than this misfiring, puerile issue of alleged racism concerns the definition and recognition of group success and vitality as contrasted with the sickness of a culture. Although in the last resort there exists a firm operational definition of failure, in the inability of a group to survive as a group, such as happened in Sodom and Gomorrah, in the Roman Empire, in the extinct culture of Angkor Vat and countless other examples from history. Beyondism can at present only provide a definition of disease too crude and too late to offer a cure. In this matter, any ethic derived from science calls for the inauguration of a kind and a volume of research in the social sciences such as is nowhere conceived at the present time. If the deliberate planning of genetic and cultural variation is to follow an enlightened, optimal design, and the recording and analysis of observations is to throw light on the causes and consequences of corruption and ill health in societies, a supernational research organization of cooperating scientists will be needed. One must leave to the future (2) the evidence that it will be possible to distinguish a moribund from a healthy society (before the moribund society actually expires) by certain diagnostic measurements, just as a doctor does with the human organism. As in biological organisms these signs may be somewhat different in different species but a common core will exist. Consequently, despite the somewhat different directions in which particular socio-genetic experiments will be heading, the objectivity of the goal by which moral behavior and other desirables in a society receive sanction remains beyond cavil; for in the last resort it is still survival or non-survival.

The conception of an organized world research center brings us to a subtle but important difference between the Beyondist conception and that which has been urged by the majority of advocates of "one world." The latter is a very old aspiration of both idealists and conquerors. It appeared in the dreams of Alexander, in the concrete citizenship of the Roman Empire, in the

Medieval Christian church, in the megalomania of Ghenghis Khan; in countless writers (practical and impractical) of which Montesquieu and H.G. Wells are good representatives, and in the slogan "One World" of a U.S. presidential candidate (Wendell Wilkie). If this concept means one uniform world, culturally and racially, as many enthusiasts interpret it, then, to a Beyondist, it is the worst catastrophe that could occur to mankind. Under what I have discussed elsewhere as "the hedonic pact" (Cattell 1972) it could put a stop to evolution, as accumulating entropy brings a faulty organism or machine to stasis. Whether such an homogeneity would be stable indefinitely is a nice question, not for pursuit here, because we have argued that it must be avoided. The "one world" of a Beyondist, by contrast, is a world organized richly with nerves conveying information to a research center acting in an advisory capacity to a highly differentiated array of national experiments.

Distinct Species of Mankind?

The possibility has to be considered that mankind should not be encouraged to remain a single biological species. Biologists tell us that when a genus comes to be represented by only one or two species this is often the prelude to its extinction. Whether this is simply from the risk of having put all its eggs in one basket, or because a low proliferation is itself in some way a sign of reduced vitality is not clear.

Since an appreciable upheaval of commonly accepted ideas follows on the recognition of a Beyondist position one is moved, in conclusion, to come back to the original problem of assent to its basic postulate and ask how compelling the argument is for embracing the evolutionary process. There are two answers to this in increasing depth. First, if our intellects are not sufficient for us to see by insight that this or any other course is correct - and admittedly we know little more of what is going on than an ant in a computer room - it is logical to aspire to an evolution of larger brain power. Rousseau and the inspirers of the French Revolution, with its rational, unempirical idealism, believed - as Johnny Small today is taught to believe - that human perfection is only just around the corner and that a perfect education will bring it about. By contrast the Beyondist sees a succession of horizons, approached hand in hand by genetic and educational advances. Perhaps the first indication of genetic brain inadequacy will come when the march of science slows, as the industrious collection and collation of data demands solutions and perceptions of relations too complex for existing man to grasp.

Secondly, though we may have freewill, we actually have only the option, as individuals, of either joining the stream of evolution or committing suicide, literally, or by refusing to reproduce when one has a positive genetic contribution to make. Dissidence is here self-annihilating, and, since we are in the field of values it is meaningful to apply such religious expressions as "blasphemous" or "diabolical" to contempt of the evolutionary principle.

The current problem in developing a wider recognition of evolutionary principles, that would guide legislation, broaden education and inaugurate research, is an emotional one. Beyondism

comes as a doctrine as stem, impersonal and abstract as that of the evolution of the stars. It accepts the reality of success and the tragedy of failure, in which individuals and races may have to recognize that they have been anvil and not hammer in the shaping of the future. What new emotional synthesis of values will make adjustment to this vaster view not only possible, but a sustenance for the good life of everyday behavior, remains to be discovered. Mankind recovered from the blow of Copernicus's demonstration that the earth is not the centre of the universe. Man's growing imagination may yet cause him to smile at the comfortable myth that he is the apple of God's eye. It can arm him to look with steely courage and sober hope at the task of bringing a species now little above an ape into greater command and knowledge of the Universe.

Science and Religion

This article began with the problem of the intrusion of religious values into science. It ends by recognizing that science must be the source of religious values. However, society faces an enormous task of emotional education before this can be fulfilled. Art, music and poetry have over the centuries helped teach the emotional expressions and adjustments that tie most of mankind to the great revealed religions. The presently needed transition, which demands a quantum leap emotionally, to a Beyondist adjustment, will need interpreters of no lesser literary and artistic genius if it is to succeed.

Unfortunately, our journalists and mass media controllers today are blindly and unquestioningly locked into the values (or the simple antitheses thereof) of the literary worlds in which they were educated and most are interested in change only in a superficial kaleidoscope of spinning fashion. The meaning of science appears to them, in most cases, only as the indulgent provider of the "good life," as the tell-tale phrase has it. One suspects that the human source from which the new values of Beyondism will eventually flow will be the socially reticent minority of dedicated scientists who have learnt in their own lives both the imagination and the realism necessary to embrace these new ethical values.

The casually thinking majorities, and the mass media, if one may judge by the character of the recent attacks on Sir Cyril Burt's emphasis on inheritance in intelligence and on Dr. Wilson's sociobiology (not to mention those on the present writer's Beyondism book) are going to respond with a naive and false "moral indignation" to appeals which transcend their comfortable "humanistic" position in the light of evolutionary realities. Psychologically they manifest the same mixture of vanity and self-indulgence as blocked for a century Copernicus's attempt to shift the earth from the centre of the universe and harried Darwin when he proposed to remove man from a privileged position outside the biological world. The Beyondist who recognizes the passing away of races and cultures in nature's continual genocide is not an "inhumanist." His compassion for these events and for individual death, which is part of the same plan, is no less than of the humanist. And his acceptance of the evolutionary goal enables him in fact to find more human ways of achieving it, as when he substitutes for harshness of a differential death

rate the eugenic method of a differential birth rate.

If a man begins with the false values of many revealed religions then, as he encounters the expanding world of scientific knowledge he will conclude like Keats that "but to think is to be full of sorrows and leaden-eyed despairs." But if he recognizes that the divisions of mankind are engaged on their several pilgrimages to different goals, but with a common evolutionary purpose, he has both peace of mind and a practical ethical system for human affairs.

(1) Both psychiatric experience with the psychopathic temperament, and behavior genetic findings of appreciable inheritance of the super ego factor G (Cattell, Blewett and Beloff 1955) suggest that a society of such genetically selected individuals would not be viable. The measurement of the performance of groups, in which pre-measured individuals are put together in small groups, shows considerable dependence of group syntality performance on personality traits known to have significant genetic determination. (Cattell & Stice, Haythorne, Lawton, Wispe)

(2) Let us make no mistake, about the superb scientific training and natural genius that will be demanded to make progress in this area. The subtleties of concept and the mathematical complexities of systems theory needed may well surpass those encountered in modern physics. Only in the last decade or two have we had even a crude beginning (Alker (1966), Cattell, Breul & Hartman (1952), Cattell, Graham & Woliver (1978), Rummell (1972), Sawyer (1967)) of attempts to discover the dimensions of functioning of national groups by which development or decline might be analytically measured and evaluated. From description to interpretation and prediction is a long step that the science of culturo- genetic organisms still has to take.

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Brain Size Matters - A Reply to Peters

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Abstract

Peters (1993) claimed that published research on brain size and IQ is flawed because it did not meet his list of minimum conditions that (a) subjects should be matched for height, weight and age, (b) analyses should be conducted separately within sex, (c) subjects should not vary in prenatal and nutritional history, (d) people with IQs appreciably below the population mean of 100 should not be studied, and (e) brain size measures should be done blind. However, these conditions have either been met or are unnecessary and/or inappropriate. We show, contrary to Peters' claims, that (a) brain size is related to mental abilities, (b) brain size varies by sex and race, and (c) mental abilities vary by sex and race. Finally, we suggest that brain size constraints on behavioural complexity may be best understood from an evolutionary perspective.

In a reply to Lynn (1993) about brain size and IQ, Peters (1993) charged bias and questionable motives to dismiss relations first established over 100 years ago. Peters (1993) claimed that studies of brain size are confounded by systematic bias, including racial bias, over and above normal measurement error. Peters (1993) also conjectured that uni-directional measurement errors may exist and so he dismissed Rushton's (1992) analyses showing race and sex differences in cranial capacity in 6,325 U.S. military personnel. Consequently, Peters claimed that such studies must be done blind, i.e., the person doing the measurement should not know the race of the subject being measured.

Peters did not note, although it was made clear in Rushton's (1992) paper, that (1) Rushton neither made the measurements nor knew who did, and (2) measurements were made to determine proper helmet sizes not brain sizes (i.e., they were done blind, as the measurers were unaware of the use that Rushton would make of their data). The East Asian/European/African differences that Rushton (1992) found in cranial capacity (cm³) using external head measurements are similar to those found by Beals, Smith, and Dodd (1984) who estimated cm³ from endocranial volume, and by Ho, Roessmann, Straumfjord, and Monroe (1980) who weighed brain mass (grams) at autopsy. Does Peters believe that Ho et al. leaned on their scales, when weighing brains of European-Americans, by just enough to produce the same difference caused by extra snug measurements supposedly made by those measuring heads of African-Americans? Regardless, it is implausible that the racial bias alleged by Peters would also produce findings that East Asians have relatively larger brains than do Europeans.

- * Allometric and nutritional factors
- * Brain size and intelligence
- * Sex differences
- * Race differences
- * Evolutionary considerations
- * References

Allometric and nutritional factors

Peters (1993) misstates when and why it is appropriate to correct for variation in body size (e.g., height or weight) when analyzing human attributes. It is only appropriate to correct for body size if one wishes to determine whether two (or more) individuals or groups are relatively different in some attribute, when it is already known that they are absolutely different in that attribute and/or in body size. For example, men and women differ in both absolute brain size and absolute body size. Thus, it is appropriate to correct for body size to determine if men have relatively larger brains. But, it would be inappropriate to correct for body size to determine if men have absolutely higher IQs.

Consider this simple analogy: John Doe is 178 cm tall and can jump 1 m off the ground, whereas basketball star Michael Jordan is 208 cm tall and can jump 1.17 m off the ground. There are two questions that we can ask from this: (1) For his size, can Michael Jordan jump higher? (Answer is no he's 17% taller and can jump 17% higher), and (2) Can Michael Jordan jump higher? (Answer is, obviously, yes).

Now, consider Peters' argument that to determine if larger brains produce (absolutely) higher IQs, one must correct for body size. This, as can be seen from the above, makes no sense. A higher IQ is a higher IQ (just as a higher jump is a higher jump) regardless of body size. On average, taller people have higher IQ's, not because they are taller, per se, but because, on average, they have larger brains. Correcting for body size reduces the question to a nullity, i.e., do tall people with their larger brains have relatively higher IQ's?

Peters erred similarly when he argued that age must be controlled when analyzing brain-size/IQ relations in adults. Both brain size (Ho et al., 1980) and IQ (Brody, 1992) decline after the age of 45 years. This likely is not coincidental but, regardless, if one corrects for age then the result would simply be that brains of similar size tend to produce similar IQ's.

Peters erroneously stated that subjects in studies of brain-size/IQ relations should have similar early-life nutrition and be from the same social class. His rationale is that these factors can affect brain size. But, the question is do people with smaller brains have lower IQ's? , not why do they have smaller brains? . It might be interesting to know why John Doe is shorter than Michael Jordan but, regardless, he cannot jump as high.

Brain size and intelligence

As Lynn (1993) showed, the IQ/brain-size relation is ubiquitous. Studies, additional to those provided by Lynn (1993), show that the correlation ranges from 0.10 to 0.30 with a mean of about 0.20 (Wickett, Vernon, & Lee, 1994). The head-perimeter/IQ relation occurs in Orientals as well as whites and blacks and is apparent early in life. The National Collaborative Perinatal Project (Broman et al., 1987) found that head perimeter at birth, at 1 year, and at 4 years correlated with IQ at age 7 from $r = 0.13$ to 0.24 in 19,000 black and 17,000 white children. Jensen and Johnson (1994) used these data to show that head size at age 7 (although not at age 4) is correlated with IQ within-families (i.e., among same-sex full siblings, with age partialled out), thus indicating a functional relation between brain size and IQ.

Magnetic resonance imaging techniques that create a 3-dimensional model of the brain in vivo confirm the brain-size/IQ relation. Five studies found an average correlation greater than 0.40, an improvement over studies that used head perimeter as a measure (Willerman et al., 1991; Andreasen et al., 1993; Raz et al., 1993; Egan et al., 1994; Wickett et al., 1994). Peters critiqued the two studies then available, but only confused the issue. First, he claimed that Willerman et al.'s (1991) low IQ group, because it averaged only 90.5, was an improper control . It was, however, not intended to be a control. Importantly, Willerman et al. showed that those with below average IQ had, on average, smaller brains. Second, Peters (1993) almost conceded the brain-size/IQ relation in his footnote citation to Andreasen et al. (1993). However, even there he suspected bias, i.e., self-selection of subjects. But, this could only bias such results if people with large-brains/high-IQ and small-brains/low-IQ volunteered, whereas those with large-brains/low-IQ and small-brains/high-IQ did not. We are unaware of evidence to support such an implausibility. Regardless, beside studies by Willerman et al. (1991) and Andreasen et al. (1993) cited by Peters (1993), the brain-size/IQ relation established using magnetic resonance imaging was corroborated by Raz et al. (1993), Egan et al. (1994), and Wickett et al. (1994).

The null hypothesis of no relation between brain size and IQ is false. In anticipation of this, Peters (1993) argued that even if brain-size/IQ correlations are valid, they account for only a small percentage of variation. But, it is predictable that correlations between IQ and overall brain size will be modest. First, much of the brain is not involved in producing what we call intelligence; thus, variation in size/mass of that tissue will reduce the correlation. Second, IQ is an imperfect measure of intelligence and thus, variation in IQ scores is an imperfect measure of variation in intelligence.

Sex differences

Peters (1993) correctly noted the absolute male/female difference in brain size. He was, however, incorrect that comparisons of brain size across sex cannot be made because there are (supposedly) no appropriate scalars of body size. Ankney (1992) reexamined Ho et al.'s (1980) autopsy data on 1,261 Americans aged 25 to 80 after excluding obviously damaged brains. Using allometric techniques that are standard in comparative biology, Ankney (1992) found that at any given surface area or height, brains of European-American men are heavier than those of European-American women and brains of African-American men are heavier than those of African-American women. For example, among 168 cm (5'7") tall European-Americans (the approximate overall mean height for men and women combined), brain mass of men averages about 100 grams heavier than that of women.

Ankney's (1992) results were confirmed in Rushton's (1992) study of a stratified random sample of U.S. Army personnel. After adjusting for effects of age, stature, weight, military rank and race, cranial capacity of men averaged 1,442 cm³ and women 1,332 cm³. This difference was found in all of the many analyses that were done to control for various possible body size effects (see Rushton, 1992). Moreover, the difference was replicated across samples of Asian-Americans, European-Americans and African-Americans, as well as in officers and enlisted personnel.

Peters (1993) correctly noted the paradox that women have proportionately smaller brains than do men, but apparently have the same IQ scores. Thus, Ankney (1992) proposed that the sex difference in brain size relates to those intellectual abilities at which men excel. Briefly, according to Kimura (1992), women excel in verbal ability, perceptual speed, and motor coordination within personal space; men do better on various spatial tests and on tests of mathematical reasoning. Ankney hypothesized that it may require more brain tissue to process spatial information. Just as increasing word processing power in a computer may require extra capacity, increasing 3-dimensional processing, as in graphics, requires a major jump in capacity. In support of Ankney's hypothesis, although Lynn (1994) found that men average 4 points higher than do women on standard IQ tests, Ankney (1995) showed that nearly all of this difference derived from men's higher scores on spatial and mathematical reasoning subtests.

Race differences

Rushton (1995) reviewed 100 years of scientific literature and found that across a triangulation of procedures, brains of East-Asians and their descendants average about 17 cm³ (1 in³) larger than those of Europeans and their descendants whose brains average about 80 cm³ (5 in³) larger than those of Africans and their descendants. Although critics can pick outliers to show counter-examples and suggest opposite trends (as could critics of a statement that men are, on average, taller than women) the aggregated data are clear (see Rushton, 1995, for full discussion).

of alleged counter examples).

Consider the following statistically significant comparisons. Using brain mass at autopsy, Ho et al. (1980) summarized data for 1,261 adults (see above) and reported a sex-combined difference between 811 European-Americans with a mean of 1,323 g (sd = 146) and 450 African-Americans with a mean of 1,223 g (sd = 144). Using endocranial volume, Beals et al. (1984, page 307, Table 5) analyzed 20,000 crania and found sex-combined brain cases differed by continental area. Excluding Caucasoid areas of Asia (e.g., India) and Africa (e.g., Egypt), 19 East Asian populations averaged 1,415 cm³ (sd = 51), 10 European groups averaged 1,362 cm³ (sd = 35) and 9 African groups averaged 1,268 cm³ (sd = 85). Using external head measurements, Rushton (1992) found, in a stratified random sample of 6,325 U.S. Army personnel, measured in 1988 to determine head size for fitting helmets, Asian-Americans, European-Americans, and African-Americans averaged 1,416, 1,380, and 1,359 cm³, respectively (see also, Rushton, 1994).

Globally, racial differences in brain size parallel those found in measured intelligence. Europeans in North America, Europe and Australasia have mean IQs of around 100. For East Asians, measured in North America and in Pacific Rim countries, means range from 101 to 111. Africans living south of the Sahara, African-Americans and African-Caribbeans (including those living in Britain), have mean IQs of from 70 to 90 (Lynn, 1991). Elementary speed of information processing in 9- to 12-year-olds, in which children decide which of several lights stands out from others, show that racial differences in mental ability are pervasive. All children can perform the tasks in less than 1 s, but more intelligent children, as measured by traditional IQ tests, perform the tasks faster than do less intelligent children. Japanese and Hong Kong children have faster decision times (controlling for movement time) than do British and Irish children who have faster decision time than South African Black and African-American children (Jensen, 1993; Jensen & Whang, 1993; Lynn, 1991).

Evolutionary considerations

Metabolically, the human brain is an expensive organ. Representing only 2% of body mass, the brain uses about 5% of basal metabolic rate in rats, cats, and dogs, about 10% in rhesus monkeys and other primates, and about 20% in humans. Thus, from an adaptationist perspective, unless large brains substantially contributed to evolutionary fitness (defined as increased survival of genes through successive generations), they would not have evolved.

Paradoxically, Peters (1993) cited Haug (1987) to refute speculations about the significance of differences in brain size across individuals, sex, or race, even though Haug (1987, p.135) reported a correlation of $r = 0.479$ ($n = 81$, $p < .001$) between number of cortical neurons and brain size including both men and women in the sample. Haug's analysis showed that a person with a brain size of 1,400 cm³ has, on average, 600 million fewer cortical neurons than an individual with a brain size of 1,500 cm³. The difference between the low end of normal (1,000

cm³) and the high end (1,700 cm³) equates to 4.200 billion neurons (a difference of 27% more neurons for a 41% increase in brain size).

Haug noted that most female data points lay above the regression line (i.e., women average more neurons for a given brain size than do men). This suggests that women's brains are differently organized than are men's, and so causes and results of race differences in brain size may be different from those of sex differences. Kolakowski and Malina (1974) hypothesized that differing roles of men and women during human evolution produced a sexual dichotomy in abilities. Men roamed from the home base to hunt, which would select for targeting ability and navigational skills; women were relatively sedentary. Ankney (1992, 1995) expanded on this hypothesis to argue that selection for such abilities also selected for relatively larger brains in men and that it may require more brain tissue to process spatial information.

Rushton (1995) provided an evolutionary hypothesis for why East Asians have the largest brains. The currently accepted view of human origins posits a beginning in Africa some 200,000 years ago, an African/non-African split about 110,000 years ago, and a European/East Asian split about 40,000 years ago (Stringer & Andrews, 1988). Evolutionary selection pressures were different in the hot savanna where Africans evolved than in the cold arctic where East Asians evolved. According to Rushton (1995), the further north the populations migrated, out of Africa, the more they encountered cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children during prolonged winters. As the original African populations evolved into Europeans and East Asians, they did so in the direction of larger brains, greater intelligence, slower rates of maturation, and other traits that differentiate these populations.

Conclusion

The evidence is overwhelming that there are racial and sexual differences in brain size, that there are racial differences in general IQ, that there are sexual differences in verbal versus performance IQ, and that differences in mental abilities are related to differences in brain size. Peters cannot simply deny this evidence. Thus, important research questions include (1) what is responsible for the group differences, i.e., are they genetically and/or environmentally caused?, (2) does the brain size/IQ correlation indicate cause and effect ?, and (3) is there bidirectional causality such that the greater learning ability of high IQ children feeds back to produce even larger brain size?

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Chapter 12 of the Book "The 'g' Factor", by Arthur Jensen

Chapter 12 entitled Population Differences In Intelligence: Causal Hypotheses from Arthur Jensen's latest book, The g Factor: The Science of Mental Ability published 1998.

The relationship of the g factor to a number of biological variables and its relationship to the size of the white-black differences on various cognitive tests (i.e., Spearman's hypothesis) suggests that the average white-black difference in g has a biological component. Human races are viewed not as discrete, or Platonic, categories, but rather as breeding populations that, as a result of natural selection, have come to differ statistically in the relative frequencies of many polymorphic genes. The "genetic distances" between various populations form a continuous variable that can be measured in terms of differences in gene frequencies. Racial populations differ in many genetic characteristics, some of which, such as brain size, have behavioral and psychometric correlates, particularly g. What I term the default hypothesis states that the causes of the phenotypic differences between contemporary populations of recent African and European descent arise from the same genetic and environmental factors, and in approximately the same magnitudes, that account for individual differences within each population. Thus genetic and environmental variances between groups and within groups are viewed as essentially the same for both populations. The default hypothesis is able to account for the present evidence on the mean white-black difference in g. There is no need to invoke any ad hoc hypothesis, or a Factor X, that is unique to either the black or the white population. The environmental component of the average g difference between groups is primarily attributable to a host of microenvironmental factors that have biological effects. They result from non-genetic variation in prenatal, perinatal, and neonatal conditions and specific nutritional factors.

The many studies of Spearman's hypothesis using the method of correlated vectors show a strong relationship between the g loadings of a great variety of cognitive tests and the mean black-white differences on those tests. The fact that the same g vectors that are correlated with W-B differences are also correlated (and to about the same degree) with vectors composed of various cognitive tests' correlations with a number of genetic, anatomical, and physiological variables suggests that certain biological factors may be related to the average black-white population difference in the level of g.

The degree to which of each of many different psychometric tests is correlated with all of the other tests is directly related to the magnitude of the test's g loading. What may seem surprising, however, is the fact that the degree to which a given test is correlated with any one of the following variables is a positive function of that test's g loading:

* Heritability of test scores. * Amount of inbreeding depression of test scores. * Heterosis (hybrid vigor, that is, raised test scores, due to outbreeding). * Head size (also, by inference, brain size). * Average evoked potential (AEP) habituation and complexity. * Glucose metabolic rate as measured by PET scan. * Average reaction time to elementary cognitive tasks. * Size of

the mean W-B difference on various cognitive tests.

The one (and probably the only) common factor that links all of these non-psychometric variables to psychometric test scores and also links psychometric test scores to the magnitude of the mean W-B difference is the g factor. The critical role of g in these relationships is shown by the fact that the magnitude of a given test's correlation with any one of the above-listed variables is correlated with the magnitude of the W-B difference on that test. For example, Rushton¹ reported a correlation ($r = +.48$) between the magnitudes of the mean W-B differences (in the American standardization sample) on eleven sub-tests of the WISC-R and the effect of inbreeding depression on the eleven subtest scores of the Japanese version of the WISC. Further, the subtests' g loadings in the Japanese data predicted the American W-B differences on the WISC-R sub-tests with $r = .69$ -striking evidence of the g factor's robustness across different cultures. Similarly, the magnitude of the mean W-B difference on each of seventeen diverse psychometric tests was predicted (with $r = .71$, $p < .01$) by the tests' correlations with head size (a composite measure of length, width, and circumference).

This association of psychometric tests' g loadings, the tests' correlations with genetic and other biological variables, and the mean W-B differences in test scores cannot be dismissed as happenstance. The failure of theories of group differences in IQ that are based exclusively on attitudinal, cultural, and experiential factors to predict or explain such findings argues strongly that biological factors, whether genetic or environmental in origin, must be investigated. Before examining possible biological factors in racial differences in mental abilities, however, we should be conceptually clear about the biological meaning of the term "race."

THE MEANING OF RACE

Nowadays one often reads in the popular press (and in some anthropology textbooks) that the concept of human races is a fiction (or, as one well-known anthropologist termed it, a "dangerous myth"), that races do not exist in reality, but are social constructions of politically and economically dominant groups for the purpose of maintaining their own status and power in a society. It naturally follows from this premise that, since races do not exist in any real, or biological, sense, it is meaningless even to inquire about the biological basis of any racial differences. I believe this line of argument has five main sources, none of them scientific:

- o Heaping scorn on the concept of race is deemed an effective way of combating racism-here defined as the belief that individuals who visibly differ in certain characteristics deemed "racial" can be ordered on a dimension of "human worth" from inferior to superior, and that therefore various civil and political rights, as well as social privileges, should be granted or denied according to a person's supposed racial origin.
- o Neo-Marxist philosophy (which still has exponents in the social sciences and the popular media) demands that individual and group differences in psychologically and socially significant

traits be wholly the result of economic inequality, class status, or the oppression of the working classes in a capitalist society. It therefore excludes consideration of genetic or biological factors (except those that are purely exogenous) from any part in explaining behavioral differences among humans. It views the concept of race as a social invention by those holding economic and political powers to justify the division and oppression of unprivileged classes.

- o The view that claims that the concept of race (not just the misconceptions about it) is scientifically discredited is seen as a way to advance more harmonious relations among the groups in our society that are commonly perceived as "racially" different.

- o The universal revulsion to the Holocaust, which grew out of the racist doctrines of Hitler's Nazi regime, produced a reluctance on the part of democratic societies to sanction any inquiry into biological aspects of race in relation to any behavioral variables, least of all socially important ones.

- o Frustration with the age-old popular wrong-headed conceptions about race has led some experts in population genetics to abandon the concept instead of attempting candidly to make the public aware of how the concept of race is viewed by most present-day scientists.

Wrong Conceptions of Race. The root of most wrong conceptions of race is the Platonic view of human races as distinct types, that is, discrete, mutually exclusive categories. According to this view, any observed variation among the members of a particular racial category merely represents individual deviations from the archetype, or ideal type, for that "race." Since, according to this Platonic view of race, every person can be assigned to one or another racial category, it naturally follows that there is some definite number of races, each with its unique set of distinctive physical characteristics, such as skin color, hair texture, and facial features. The traditional number has been three: Caucasoid, Mongoloid, and Negroid, in part derived from the pre-Darwinian creationist view that "the races of mankind" could be traced back to the three sons of Noah-Shem, Ham, and Japheth.

The Cause of Biological Variation. All that is known today about the worldwide geographic distribution of differences in human physical characteristics can be understood in terms of the synthesis of Darwinian evolution and population genetics developed by R. A. Fisher, Sewall Wright, Theodosius Dobzhansky, and Ernst Mayr. Races are defined in this context as breeding populations that differ from one another in gene frequencies and that vary in a number of intercorrelated visible features that are highly heritable.

Racial differences are a product of the evolutionary process working on the human genome, which consists of about 100,000 polymorphic genes (that is, genes that contribute to genetic variation among members of a species) located in the twenty-three pairs of chromosomes that exist in every cell of the human body. The genes, each with its own locus (position) on a particular chromosome, contain all of the chemical information needed to create an organism. In

addition to the polymorphic genes, there are also a great many other genes that are not polymorphic (that is, are the same in all individuals in the species) and hence do not contribute to the normal range of human variation. Those genes that do produce variation are called polymorphic genes, as they have two or more different forms called alleles, whose codes differ in their genetic information. Different alleles, therefore, produce different effects on the phenotypic characteristic determined by the gene at a particular chromosomal locus. Genes that do not have different alleles (and thus do not have variable phenotypic effects) are said to have gone to fixation; that is, alternative alleles, if any, have long since been eliminated by natural selection in the course of human or mammalian evolution. The physiological functions served by most basic "housekeeping" genes are so crucial for the organism's development and viability that almost any mutation of them proves lethal to the individual who harbors it; hence only one form of the gene is possessed by all members of a species. A great many such essential genes are in fact shared by closely related species; the number of genes that are common to different species is inversely related to the evolutionary distance between them. For instance, the two living species closest to *Homo sapiens* in evolutionary distance, chimpanzees and gorillas, have at least 97 percent of their genes (or total genetic code) in common with present-day humans, scarcely less than chimps and gorillas have in common with each other. This means that even the very small percentage of genes (<3 percent) that differ between humans and the great apes is responsible for all the conspicuous and profound phenotypic differences observed between apes and humans. The genetic difference appears small only if viewed on the scale of differences among all animal species.

A particular gene's genetic code is determined by the unique sequences of four chemical bases of the DNA, arranged in the familiar double-helix structure of the gene. A change in a gene's code (one base pair), however slight, can produce a new or different allele that manifests a different phenotypic effect. (Many such mutations, however, have no phenotypic effect because of redundancy in the DNA.) Such changes in the DNA result from spontaneous mutation. Though mutations occur at random, some gene loci have much higher mutation rates than others, ranging for different loci from less than one per million to perhaps more than 500 per million sex cells—not a trivial number considering that each male ejaculation contains from 200 to 500 million sperm. While natural or spontaneous mutations have largely unknown causes, aptly referred to as biological "noise," it has been shown experimentally that mutations can result from radiation (X-rays, gamma rays, cosmic rays, and ultraviolet radiation). Certain chemical substances are also mutagenic.

The creation of new alleles by spontaneous mutation along with the recombination of alleles in gametogenesis are essential conditions for the evolution of all forms of life. A new allele with phenotypic effects that decrease an individual's fitness in a given environment, compared to the nonmutated allele that would normally occupy the same chromosomal locus, will be passed on to fewer descendants and will eventually go to extinction. The gene is driven out of existence, so to speak, by losing in the competition with other alleles that afford greater fitness. Biological fitness (also known as Darwinian fitness), as a technical term in evolutionary genetics, refers

only to an individual's reproductive success, often defined operationally as the number of surviving fertile progeny of that individual. (A horse mated with a donkey, for example, might produce many surviving offspring, but because they are all sterile, the horse and donkey in this mating have a fitness of zero.) The frequency of a particular gene in all of an individual's relatives is termed the inclusive fitness of that gene. The inclusive fitness of a gene is a measure of its effect on the survival and reproductive success of both the individual bearing the gene and all of the individual's relatives bearing the identical gene. Technically speaking, an individual's biological fitness denotes nothing more than that individual's genetic contribution to the next generation's gene pool relative to the average for the population. The term does not necessarily imply any traits one may deem personally desirable, such as vigor, physical strength, or a beautiful body, although some such traits, to the extent that they are heritable, were undoubtedly genetically selected in the course of evolution only because, we know in retrospect, they enhanced individuals' reproductive success in succeeding generations. The survival of any new allele and its rate of spreading through subsequent generations is wholly a function of the degree to which its phenotypic expression enhances the inclusive fitness of those who inherit the allele. An allele with any advantageous phenotypic effect, in this respect, spreads to an ever-larger part of the breeding population in each successive generation.

New alleles created by mutation are subject to natural selection according to the degree of fitness they confer in a particular environment. Changed environmental conditions can alter the selection pressure for a certain allele, depending on the nature of its phenotypic expression, thereby either increasing or decreasing its frequency in a breeding population. Depending on its fitness in a given environment, it may go to extinction in the population or it may go to fixation (with every member of the population eventually possessing the allele). Many polymorphic gene loci harbor one or another allele of a balanced polymorphism, wherein two or more alleles with comparable fitness values (in a particular environment) are maintained at equilibrium in the population. Thus spontaneous genetic mutation and recombination, along with differential selection of new alleles according to how their phenotypic expression affects inclusive fitness, are crucial mechanisms of the whole evolutionary process. The variation in all inherited human characteristics has resulted from this process, in combination with random changes caused by genetic drift and gene frequency changes caused by migration and intermarriage patterns.

Races as Breeding Populations with Fuzzy Boundaries. Most anthropologists and population geneticists today believe that the preponderance of evidence from both the dating of fossils and the analysis of the geographic distribution of many polymorphic genes in present-day indigenous populations argues that genus *Homo* originated in Africa. Estimates are that our direct distant hominid precursor split off from the great apes some four to six million years ago. The consensus of human paleontologists (as of 1997) accept the following basic scenario of human evolution.

Australopithecus afarensis was a small (about 3'6"), rather ape-like hominid that appears to have been ancestral to all later hominids. It was bipedal, walking more or less upright, and had a

cranial capacity of 380 to 520 cm³ (about the same as that of the chimpanzee, but relatively larger for its overall body size). Branching from this species were at least two lineages, one of which led to a new genus, *Homo*.

Homo also had several branches (species). Those that were precursors of modern humans include *Homo habilis*, which lived about 2.5 to 1.5 million years ago. It used tools and even made tools, and had a cranial capacity of 510 to 750 cm³ (about half the size of modern humans). *Homo erectus* lived about 1.5 to 0.3 million years ago and had a cranial capacity of 850 to 1100 cm³ (about three-fourths the size of modern humans). The first hominid whose fossil remains have been found outside Africa, *Homo erectus*, migrated as far as the Middle East, Europe, and Western and Southeastern Asia. No *Homo erectus* remains have been found in Northern Asia, whose cold climate probably was too severe for their survival skills.

Homo sapiens branched off the *Homo erectus* line in Africa at least 100 thousand years ago. During a period from about seventy to ten thousand years ago they spread from Africa to the Middle East, Europe, all of Asia, Australia, and North and South America. To distinguish certain archaic subspecies of *Homo sapiens* (e.g., Neanderthal man) that became extinct during this period from their contemporaries who were anatomically modern humans, the latter are now referred to as *Homo sapiens sapiens* (or *Homo s. sapiens*); it is this line that branched off *Homo erectus* in Africa and spread to every continent during the last 70,000 years. These prehistoric humans survived as foragers living in small groups that frequently migrated in search of food.

GENETIC DISTANCE

As small populations of *Homo s. sapiens* separated and migrated further away from Africa, genetic mutations kept occurring at a constant rate, as occurs in all living creatures. Geographic separation and climatic differences, with their different challenges to survival, provided an increasingly wider basis for populations to become genetically differentiated through natural selection. Genetic mutations that occurred after each geographic separation of a population had taken place were differentially selected in each subpopulation according to the fitness the mutant gene conferred in the respective environments. A great many mutations and a lot of natural selection and genetic drift occurred over the course of the five or six thousand generations that humans were gradually spreading over the globe.

The extent of genetic difference, termed genetic distance, between separated populations provides an approximate measure of the amount of time since their separation and of the geographic distance between them. In addition to time and distance, natural geographic hindrances to gene flow (i.e., the interchange of genes between populations), such as mountain ranges, rivers, seas, and deserts, also restrict gene flow between populations. Such relatively isolated groups are termed breeding populations, because a much higher frequency of mating occurs between individuals who belong to the same population than occurs between individuals from different populations. (The ratio of the frequencies of within/between population matings

for two breeding populations determines the degree of their genetic isolation from one another.) Hence the combined effects of geographic separation [or cultural separation], genetic mutation, genetic drift, and natural selection for fitness in different environments result in population differences in the frequencies of different alleles at many gene loci.

There are also other causes of relative genetic isolation resulting from language differences as well as from certain social, cultural, or religious sanctions against persons mating outside their own group. These restrictions of gene flow may occur even among populations that occupy the same territory. Over many generations these social forms of genetic isolation produce breeding populations (including certain ethnic groups) that evince relatively slight differences in allele frequencies from other groups living in the same locality.

When two or more populations differ markedly in allele frequencies at a great many gene loci whose phenotypic effects visibly distinguish them by a particular configuration of physical features, these populations are called subspecies. Virtually every living species on earth has two or more subspecies. The human species is no exception, but in this case subspecies are called races. Like all other subspecies, human races are interfertile breeding populations whose individuals differ on average in distinguishable physical characteristics.

Because all the distinguishable breeding populations of modern humans were derived from the same evolutionary branch of the genus *Homo*, namely, *Homo s. sapiens*, and because breeding populations have relatively permeable (non-biological) boundaries that allow gene flow between them, human races can be considered as genetic "fuzzy sets." That is to say, a race is one of a number of statistically distinguishable groups in which individual membership is not mutually exclusive by any single criterion, and individuals in a given group differ only statistically from one another and from the group's central tendency on each of the many imperfectly correlated genetic characteristics that distinguish between groups as such. The important point is that the average difference on all of these characteristics that differ among individuals within the group is less than the average difference between the groups on these genetic characteristics.

What is termed a cline results where groups overlap at their fuzzy boundaries in some characteristic, with intermediate gradations of the phenotypic characteristic, often making the classification of many individuals ambiguous or even impossible, unless they are classified by some arbitrary rule that ignores biology. The fact that there are intermediate gradations or blends between racial groups, however, does not contradict the genetic and statistical concept of race. The different colors of a rainbow do not consist of discrete bands but are a perfect continuum, yet we readily distinguish different regions of this continuum as blue, green, yellow, and red, and we effectively classify many things according to these colors. The validity of such distinctions and of the categories based on them obviously need not require that they form perfectly discrete Platonic categories.

It must be emphasized that the biological breeding populations called races can only be defined

statistically, as populations that differ in the central tendency (or mean) on a large number of different characteristics that are under some degree of genetic control and that are correlated with each other through descent from common ancestors who are relatively recent in the time scale of evolution (i.e., those who lived about ten thousand years ago, at which time all of the continents and most of the major islands of the world were inhabited by relatively isolated breeding populations of *Homo s. sapiens*).

Of course, any rule concerning the number of gene loci that must show differences in allele frequencies (or any rule concerning the average size of differences in frequency) between different breeding populations for them to be considered races is necessarily arbitrary, because the distribution of average absolute differences in allele frequencies in the world's total population is a perfectly continuous variable. Therefore, the number of different categories, or races, into which this continuum can be divided is, in principle, wholly arbitrary, depending on the degree of genetic difference a particular investigator chooses as the criterion for classification or the degree of confidence one is willing to accept with respect to correctly identifying the area of origin of one's ancestors.

Some scientists have embraced all of *Homo sapiens* in as few as two racial categories, while others have claimed as many as seventy. These probably represent the most extreme positions in the "lumper" and "splitter" spectrum. Logically, we could go on splitting up groups of individuals on the basis of their genetic differences until we reach each pair of monozygotic twins, which are genetically identical. But as any pair of MZ twins are always of the same sex, they of course cannot constitute a breeding population. (If hypothetically they could, the average genetic correlation between all of the offspring of any pair of MZ twins would be $2/3$; the average genetic correlation between the offspring of individuals paired at random in the total population is $1/2$; the offspring of various forms of genetic relatedness, such as cousins [a preferred match in some parts of the world], falls somewhere between $2/3$ and $1/2$.) However, as I will explain shortly, certain multivariate statistical methods can provide objective criteria for deciding on the number and composition of different racial groups that can be reliably determined by the given genetic data or that may be useful for a particular scientific purpose. But one other source of genetic variation between populations must first be explained.

Genetic Drift. In addition to mutation, natural selection, and migration, another means by which breeding population may differ in allele frequencies is through a purely stochastic (that is, random) process termed genetic drift. Drift is most consequential during the formation of new populations when their numbers are still quite small. Although drift occurs for all gene loci, Mendelian characters (i.e., phenotypic traits), which are controlled by a single gene locus, are more noticeably affected by drift than are polygenic traits (i.e., those caused by many genes). The reason is purely statistical.

Changes in a population's allele frequencies attributable to genetic drift can be distinguished from changes due to natural selection for two reasons: (1) Many genes are neutral in the sense

that their allele frequencies have remained unaffected by natural selection, because they neither increase nor decrease fitness; over time they move across the permeable boundaries of different breeding populations. (2) When a small band of individuals emigrates from the breeding population of origin to found a new breeding population, it carries with it only a random sample of all of the alleles, including neutral alleles, that existed in the entire original population. That is, the allele frequencies at all gene loci in the migrating band will not exactly match the allele frequencies in the original population. The band of emigrants, and of course all its descendants (who may eventually form a large and stable breeding population), therefore differs genetically from its parent population as the result of a purely random process. This random process is called founder effect. It applies to all gene loci. All during the time that genetic drift was occurring, gene mutations steadily continued, and natural selection continued to produce changes in allele frequencies at many loci. Thus the combined effects of genetic drift, mutation, and natural selection ensure that a good many alleles are maintained at different frequencies in various relatively isolated breeding populations. This process did not happen all at once and then cease. It is still going on, but it takes place too slowly to be perceived in the short time span of a few generations.

It should be noted that the phenotypic differences between populations that were due to genetic drift are considerably smaller than the differences in those phenotypic characteristics that were strongly subject to natural selection, especially those traits that reflect adaptations to markedly different climatic conditions, such as darker skin color (thought to have evolved as protection from the tropical sun's rays that can cause skin cancer and to protect against folate decomposition by sunlight), light skin color (to admit more of the ultraviolet rays needed for the skin's formation of vitamin D in northern regions; also because clothing in northern latitudes made dark skin irrelevant selectively and it was lost through random mutation and drift), and globular versus elongated body shape and head shape (better to conserve or dissipate body heat in cold or hot climates, respectively).

Since the genetic drift of neutral genes is a purely random process, and given a fairly constant rate of drift, the differing allele frequencies of many neutral genes in various contemporary populations can be used as a genetic clock to determine the approximate time of their divergence. The same method has been used to estimate the extent of genetic separation, termed genetic distance, between populations.

Measurement and Analysis of Genetic Distance Between Groups. Modern genetic technology makes it possible to measure the genetic distance between different populations objectively with considerable precision, or statistical reliability. This measurement is based on a large number of genetic polymorphisms for what are thought to be relatively neutral genes, that is, genes whose allele frequencies therefore differ across populations more because of mutations and genetic drift than because of natural selection. Population allele frequencies can be as low as zero or as high as 1.0 (as there are certain alleles that have large frequencies in some populations but are not found at all in other populations). Neutral genes are preferred in this work because they

provide a more stable and accurate evolutionary "clock" than do genes whose phenotypic characters have been subjected to the kinds of diverse external conditions that are the basis for natural selection. Although neutral genes provide a more accurate estimate of populations' divergence times, it should be noted that, by definition, they do not fully reflect the magnitude of genetic differences between populations that are mainly attributable to natural selection.

The technical rationale and formulas for calculating genetic distance are fully explicated elsewhere. For present purposes, the genetic distance, D , between two groups can be thought of here simply as the average difference in allele frequencies between two populations, with D scaled to range from zero (i.e., no allele differences) to one (i.e., differences in all alleles). One can also think of D as the complement of the correlation coefficient r (i.e., $D = 1 - r$, and $r = 1 - D$). This conversion of D to r is especially useful, because many of the same objective multivariate statistical methods that were originally devised to analyze large correlation matrices (e.g., principal components analysis, factor analysis, hierarchical cluster analysis, multidimensional scaling) can also be used to analyze the total matrix of genetic distances (after they are converted to correlations) between a large number of populations with known allele frequencies based on some large number of genes.

The most comprehensive study of population differences in allele frequencies to date is that of the Stanford University geneticist Luigi Luca Cavalli-Sforza and his coworkers. Their recent 1,046-page book reporting the detailed results of their study is a major contribution to the science of population genetics. The main analysis was based on blood and tissue specimens obtained from representative samples of forty-two populations, from every continent (and the Pacific islands) in the world. All the individuals in these samples were aboriginal or indigenous to the areas in which they were selected samples; their ancestors have lived in the same geographic area since no later than 1492, a familiar date that generally marks the beginning of extensive worldwide European explorations and the consequent major population movements. In each of the Stanford study's population samples, the allele frequencies of 120 alleles at forty-nine gene loci were determined. Most of these genes determine various blood groups, enzymes, and proteins involved in the immune system, such as human lymphocyte antigens (HLA) and immunoglobulins. These data were then used to calculate the genetic distance (D) between each group and every other group. (DNA sequencing was also used in separate analyses of some groups; it yields finer genetic discrimination between certain groups than can the genetic polymorphisms used in the main analysis.) From the total matrix of $(42 \times 41)/2 = 861$ D values, Cavalli-Sforza et al. constructed a genetic linkage tree. The D value between any two groups is represented graphically by the total length of the line that connects the groups in the branching tree. (See Figure 12.1.)

The greatest genetic distance, that is, the largest D , is between the five African groups (listed at the top of Figure 12.1) and all the other groups. The next largest D is between the Australian + New Guinean groups and the remaining other groups; the next largest split is between the South Asians + Pacific Islanders and all the remaining groups, and so on. The clusters at the lowest

level (i.e., at far right in Figure 12.1) can also be clustered to show the D values between larger groupings, as in Figure 12.2. Note that these clusters produce much the same picture as the traditional racial classifications that were based on skeletal characteristics and the many visible physical features by which non-specialists distinguish "races."

It is noteworthy, but perhaps not too surprising, that the grouping of various human populations in terms of invisible genetic polymorphisms for many relatively neutral genes yields results that are highly similar to the classic methods of racial classification based on directly observable anatomical features.

Another notable feature of the Stanford study is that the geographic distances between the locations of the groups that are less than 5,000 miles apart are highly correlated ($r \sim .95$) with the respective genetic distances between these groups. This argues that genetic distance provides a fairly good measure of the rate of gene flow between populations that were in place before A.D. 1492.

None of the 120 alleles used in this study has equal frequencies across all of the forty-two populations. This attests to the ubiquity of genetic variation among the world's populations and subpopulations.

All of the modern human population studies based on genetic analysis (including analyses based on DNA markers and sequences) are in close agreement in showing that the earliest, and by far the greatest, genetic divergence within the human species is that between Africans and non-Africans (see Figures 12.1 and 12.2).

Cavalli-Sforza et al. transformed the distance matrix to a correlation matrix consisting of 861 correlation coefficients among the forty-two populations, so they could apply principal components (PC) analysis to their genetic data. (PC analysis is similar to factor analysis; the essential distinction between them is explained in Chapter 3, Note 13.) PC analysis is a wholly objective mathematical procedure. It requires no decisions or judgments on anyone's part and yields identical results for everyone who does the calculations correctly. (Nowadays the calculations are performed by a computer program specifically designed for PC analysis.) The important point is that if the various populations were fairly homogeneous in genetic composition, differing no more genetically than could be attributable only to random variation, a PC analysis would not be able to cluster the populations into a number of groups according to their genetic propinquity. In fact, a PC analysis shows that most of the forty-two populations fall very distinctly into the quadrants formed by using the first and second principal components as axes (see Figure 12.3). They form quite widely separated clusters of the various populations that resemble the "classic" major racial groups-Caucasians in the upper right, Negroids in the lower right, Northeast Asians in the upper left, and Southeast Asians (including South Chinese) and Pacific Islanders in the lower left. The first component (which accounts for 27 percent of the total genetic variation) corresponds roughly to the geographic migration distances (or therefore

time since divergence) from sub-Saharan Africa, reflecting to some extent the differences in allele frequencies that are due to genetic drift. The second component (which accounts for 16 percent of the variation) appears to separate the groups climatically, as the groups' positions on PC2 are quite highly correlated with the degrees latitude of their geographic locations. This suggests that not all of the genes used to determine genetic distances are entirely neutral, but at least some of them differ in allele frequencies to some extent because of natural selection for different climatic conditions. I have tried other objective methods of clustering on the same data (varimax rotation of the principal components, common factor analysis, and hierarchical cluster analysis). All of these types of analysis yield essentially the same picture and identify the same major racial groupings.

African-Americans. The first Africans arrived in North America in 1619 and for more than two centuries thereafter, mostly between 1700 and 1800, the majority of Africans were brought to America as slaves. The end to this involuntary migration came between 1863 and 1865, with the Emancipation Proclamation. Nearly all of the Africans who were enslaved came from sub-Saharan West Africa, specifically the coastal region from Senegal to Angola. The populations in this area are often called West African or North West and Central West Bantu.

Steadily over time, the real, but relatively low frequency of cross-mating between blacks and whites produced an infusion of Caucasoid genes into the black gene pool. As a result, the present-day population of black Americans is genetically different from the African populations from whom they descended. Virtually 100 percent of contemporary black Americans have some Caucasian ancestry. Most of the Caucasian genes in the present-day gene pool of black Americans entered the black gene pool during the period of slavery.

Estimates of the proportion of Caucasoid genes in American blacks are based on a number genetic polymorphisms that have fairly high allele frequencies in the European population but zero or near-zero frequencies in the West African population, or vice versa. For any given allele, the estimated proportion (M) of white European ancestry in American blacks is obtained by the formula $M = (q_B - q_{Af}) / (q_W - q_{Af})$ where q_B is the given allele's frequency in the black American population, q_{Af} is its frequency in the African population, and q_W is its frequency in the white European population. The average value of M is obtained over each of twenty or so genes with alleles that are unique either to Africans or to Europeans. The largest studies, which yield estimates with the greatest precision, give mean values of M close to 25 percent, with a standard error of about 3 percent. This is probably the best estimate for the African-American population overall. However, M varies across different regions of the United States, being as low as 4 percent to 10 percent in some southeastern States and spreading out in a fan-shaped gradient toward the north and the west to reach over 40 percent in some northeastern and northwestern states. Among the most typical and precise estimates of M are those for Oakland, California (22.0 percent) and Pittsburgh, Pennsylvania (25.2 percent). This regional variation in M reflects the pattern of selective migration of blacks from the Deep South since the mid-nineteenth century. Gene flow, of course, goes in both directions. In every generation there has been a

small percentage of persons who have some African ancestry but whose ancestry is predominantly Caucasian and who permanently "pass as white." The white American gene pool therefore contains some genes that can be traced to Africans who were brought over as slaves (estimated by analyses of genetic polymorphisms to be less than 1 percent).

Genetic Distance and Population Differences in *g*. The preceding discourse on the genetics of populations is germane to any discussion of population differences in *g*. The differences in gene frequencies that originally created different breeding populations largely explain the physical phenotypic differences observed between populations called races. Most of these differences in visible phenotypic characteristics are the result of natural selection working over the course of human evolution. Selection changes gene frequencies in a population by acting directly on any genetically based phenotypic variation that affects Darwinian fitness for a given environment. This applies not only to physical characteristics, but also to behavioral capacities, which are necessarily to some degree a function of underlying physical structures. Structure and function are intimately related, as their evolutionary origins are inseparable.

The behavioral capacities or traits that demonstrate genetic variation can also be viewed from an evolutionary perspective. Given the variation in allele frequencies between populations for virtually every known polymorphic gene, it is exceedingly improbable that populations do not differ in the alleles that affect the structural and functional basis of heritable behavioral traits. The empirical generalization that every polygenic physical characteristic that shows differences between individuals also shows mean differences between populations applies to behavioral as well as physical characteristics. Given the relative genetic distances between the major racial populations, one might expect some behavioral differences between Asians and Europeans to be of lesser magnitude than those between these groups and sub-Saharan Africans.

The behavioral, psychological, or mental characteristics that show the highest *g* loadings are the most heritable and have the most biological correlates (see Chapter 6) and are therefore the most likely to show genetic population differences. Because of the relative genetic distances, they are also the most likely to show such differences between Africans (including predominantly African descendants) and Caucasians or Asians.

Of the approximately 100,000 human polymorphic genes, about 50,000 are functional in the brain and about 30,000 are unique to brain functions. The brain is by far the structurally and functionally most complex organ in the human body and the greater part of this complexity resides in the neural structures of the cerebral hemispheres, which, in humans, are much larger relative to total brain size than in any other species. A general principle of neural organization states that, within a given species, the size and complexity of a structure reflect the behavioral importance of that structure. The reason, again, is that structure and function have evolved conjointly as an integrated adaptive mechanism. But as there are only some 50,000 genes involved in the brain's development and there are at least 200 billion neurons and trillions of synaptic connections in the brain, it is clear that any single gene must influence some huge

number of neurons-not just any neurons selected at random, but complex systems of neurons organized to serve special functions related to behavioral capacities.

It is extremely improbable that the evolution of racial differences since the advent of *Homo sapiens* excluded allelic changes only in those 50,000 genes that are involved with the brain.

Brain size has increased almost threefold during the course of human evolution, from about 500 cm³ in the australopithecenes to about 1,350 cm³ (the present estimated worldwide average) in *Homo sapiens*. Nearly all of this increase in brain volume has occurred in connection with those parts of the cerebral hemispheres associated with cognitive processes, particularly the prefrontal lobes and the posterior association areas, which control foresight, planning, goal-directed behavior, and the integration of sensory information required for higher levels of information processing. The parts of the brain involved in vegetative and sensorimotor functions per se differ much less in size, relative to total brain size, even between humans and chimpanzees than do the parts of the brain that subserve cognitive functions. Moreover, most of the evolutionary increase in brain volume has resulted not from a uniform increase in the total number of cortical neurons per Se, but from a much greater increase in the number and complexity of the interconnections between neurons, making possible a higher level of interneuronal communication on which complex information processing depends. Although the human brain is three times larger than the chimpanzee brain, it has only 1.25 times as many neurons; the much greater difference is in their degree of arborization, that is, their number of synapses and interconnecting branches.

No other organ system has evolved as rapidly as the brain of *Homo sapiens*, a species that is unprecedented in this respect. Although in hominid evolution there was also an increase in general body size, it was not nearly as great as the increase in brain size. In humans, the correlation between individual differences in brain size and in stature is only about + .20. One minus the square of this relatively small correlation, which is .96, reflects the proportion of the total variance in brain size that cannot be accounted for by variation in overall body size. Much of this residual variance in brain size presumably involves cognitive functions.

Bear in mind that, from the standpoint of natural selection, a larger brain size (and its corresponding larger head size) is in many ways decidedly disadvantageous. A large brain is metabolically very expensive, requiring a high-calorie diet. Though the human brain is less than 2 percent of total body weight, it accounts for some 20 percent of the body's basal metabolic rate (BMR). In other primates, the brain accounts for about 10 percent of the BMR, and for most carnivores, less than 5 percent. A larger head also greatly increases the difficulty of giving birth and incurs much greater risk of perinatal trauma or even fetal death, which are much more frequent in humans than in any other animal species. A larger head also puts a greater strain on the skeletal and muscular support. Further, it increases the chances of being fatally hit by an enemy's club or missile. Despite such disadvantages of larger head size, the human brain, in fact, evolved markedly in size, with its cortical layer accommodating to a relatively lesser increase in head size by becoming highly convoluted in the endocranial vault. In the evolution of the brain,

the effects of natural selection had to have reflected the net selective pressures that made an increase in brain size disadvantageous versus those that were advantageous. The advantages obviously outweighed the disadvantages to some degree or the increase in hominid brain size would not have occurred.

The only conceivable advantage to an increase in the size and complexity of the brain is the greater behavioral capacity this would confer. This would include: the integration of sensory information, fine hand-eye coordination, quickness of responding or voluntary response inhibition and delayed reaction depending on the circumstances, perceiving functional relationships between two things when only one or neither is physically 'present, connecting past and future events, learning from experience, generalization, far transfer of learning, imagery, intentionality and planning, short-term and long-term memory capacity, mentally manipulating objects without need to handle them physically, foresight, problem solving, use of denotative language in vocal communication, as well as all of the information processes that are inferred from performance on what were referred to in Chapter 8 as "elementary cognitive tasks." These basic information processes are involved in coping with the natural exigencies and the contingencies of humans' environment. An increase in these capabilities and their functional efficiency are, in fact, associated with allometric differences in brain size between various species of animals, those with greater brain volume in relation to their overall body size generally displaying more of the kinds of capabilities listed above. The functional efficiency of the various behavioral capabilities that are common to all members of a given species can be enhanced differentially by natural selection, in the same way (though probably not to the same degree) that artificial selection has made dogs of various breeds differ in propensities and trainability for specific types of behavior.

What kinds of environmental pressures encountered by *Homo erectus* and early *Homo sapiens* would have selected for increased size and complexity of the brain? Evolutionists have proposed several plausible scenarios. Generally, a more complex brain would be advantageous in hunting skill, cooperative social interaction, and the development of tool use, followed by the higher-order skill of using tools to make other tools, a capacity possessed by no contemporary species other than *Homo sapiens*.

The environmental forces that contributed to the differentiation of major populations and their gene pools through natural selection were mainly climatic, but parasite avoidance and resistance were also instrumental. *Homo sapiens* evolved in Africa from earlier species of *Homo* that originated there. In migrating from Africa and into Europe and Asia, they encountered highly diverse climates. These migrants, like their parent population that remained in sub-Saharan Africa, were foragers, but they had to forage for sustenance under the highly different conditions of their climatically diverse habitats. Foraging was possible all during the year in the tropical and subtropical climates of equatorial regions, while in the more northern climate of Eurasia the abundance of food that could be obtained by hunting and gathering greatly fluctuated with the seasons. This necessitated the development of more sophisticated techniques for hunting large

game, requiring vocal communication and cooperative efforts (e.g., by ambushing, trapping, or corralling), along with foresight in planning ahead for the preservation, storage, and rationing of food in order to survive the severe winter months when foraging is practically impossible. Extreme seasonal changes and the cold climate of the northern regions (now inhabited by Mongoloids and Caucasians) also demanded the ingenuity and skills for constructing more permanent and sturdy dwellings and designing substantial clothing to protect against the elements. Whatever bodily and behavioral adaptive differences between populations were wrought by the contrasting conditions of the hot climate of sub-Saharan Africa and the cold seasons of northern Europe and northeast Asia would have been markedly intensified by the last glaciation, which occurred approximately 30,000 to 10,000 years ago, after *Homo sapiens* had inhabited most of the globe. During this long period of time, large regions of the Northern Hemisphere were covered by ice and the north Eurasian winters were far more severe than they have ever been for over 10,000 years.

It seems most plausible, therefore, that behavioral adaptations of a kind that could be described as complex mental abilities were more crucial for survival of the populations that migrated to the northern Eurasian regions, and were therefore under greater selection pressure as fitness characters, than in the populations that remained in tropical or subtropical regions.

Climate has also influenced the evolution of brain size apparently indirectly through its direct effect on head size, particularly the shape of the skull. Head size and shape are more related to climate than is the body as a whole. Because the human brain metabolizes 20 percent of the body's total energy supply, it generates more heat in relation to its size than any other organ. The resting rate of energy output of the average European adult male's brain is equal to about three-fourths that of a 100-watt light bulb. Because temperature changes in the brain of only four to five degrees Celsius, are seriously adverse to the normal functioning of the brain, it must conserve heat (in a cold environment) or dissipate heat (in a hot environment). Simply in terms of solid geometry, a sphere contains a larger volume (or cubic capacity) for its total surface area than does than any other shape. Conversely, a given volume can be contained in a sphere that has a smaller surface area than can be contained by a non-spherical shape with the same surface area (an elongated oval shape, for instance). Since heat radiation takes place at the surface, more spherical shapes will radiate less heat and conserve more heat for a given volume than a non-spherical shape, and less spherical shapes will lose more heat by radiation. Applying these geometric principles to head size and shape, one would predict that natural selection would favor a smaller head with a less spherical (dolichocephalic) shape because of its better heat dissipation in hot climates, and would favor a more spherical (brachycephalic) head to accommodate a larger volume of brain matter with a smaller surface area because of its better heat conservation in cold climates. (The dolichocephalic-brachycephalic dimension is related to the head's width:length ratio, known as the cephalic index.) In brief, a smaller, dolichocephalic cranium is advantageous for thermoregulation of the brain in a hot climate, whereas a larger, brachycephalic cranium is advantageous in a cold climate. In the world's populations, head breadth is correlated about $+0.8$ with cranial capacity; head length is correlated about $+0.4$.

Evidence that the average endocranial volume of various populations is related to cranial shape and that both phenomena are, in some part, adaptations to climatic conditions in different regions has been shown by physical anthropologist Kenneth Beals and his co-workers. They amassed measurements of endocranial volume in modern humans from some 20,000 individual crania collected from every continent, representing 122 ethnically distinguishable populations. They found that the global mean cranial capacity for populations in hot climates is $1,297 \pm 10.5$ cm³ for populations in cold and temperate climates it is $1,386 \pm 6.7$ cm³, a highly significant ($p < 10^{-4}$) difference of 89 cm³. Beals also plotted a correlation scatter diagram of the mean cranial capacity in cm³ of each of 122 global populations as a function of their distance from the equator (in absolute degrees north or south latitude). The Pearson correlation between absolute distance from the equator and cranial capacity was $r = +.62$ ($p < 10^{-5}$). (The regression equation is: cranial capacity = $2.5 \text{ cm}^3 \times \{\text{degrees latitude}\} + 1257.3 \text{ cm}^3$; that is, an average increase of 2.5 cm³ in cranial capacity for every 1 degree increase in latitude.) The same analysis applied to populations of the African-Eurasian landmass showed a cranial capacity X latitude correlation of + .76 ($p < 10^{-4}$) and a regression slope of 3.1 cm³ increase in cranial capacity per every 1 degree of absolute latitude in distance from the equator. The indigenous populations of North and South American continents show a correlation of + .44 and a regression slope of 1.5; the relationship of cranial capacity to latitude is less pronounced in the New World than in the Old World, probably because *Homo sapiens* inhabited the New World much more recently, having migrated from Asia to North America only about 15,000 years ago, while *Homo sapiens* have inhabited the African and Eurasian continents for a much longer period.

RACIAL DIFFERENCES IN HEAD/BRAIN SIZE

Are the climatic factors associated with population differences in cranial capacity, as summarized in the preceding section, reflected in the average cranial or brain-size measurements of the three broadest contemporary population groups, generally termed Caucasoid (Europeans and their descendants), Negroid (Africans and descendants), and Mongoloid (Northeast Asians and descendants)? A recent comprehensive review summarized the worldwide literature on brain volume in cm³ as determined from four kinds of measurements: (a) direct measurement of the brain obtained by autopsy, (b) direct measurement of endocranial volume of the skull, (c) cranial capacity estimated from external head measurements, and (d) cranial capacity estimated from head measurements and corrected for body size. The aggregation of data obtained by different methods, based on large samples, from a number of studies tends to average-out the sampling error and method effects and provides the best overall estimates of the racial group means in head/brain size measurements. The results of this aggregation are shown in Table 12.1.

Probably the technically most precise data on brain size for American whites and blacks were obtained from a study of autopsied brains by a team of experts at the Case-Western Reserve University's Medical School in Cleveland, Ohio. It measured the autopsied brains of 811 whites and 450 blacks matched for mean age (sixty years). Subjects with any brain pathology were excluded from the study. The same methods were used to remove, preserve, and weigh the

brains for all subjects. The results for each race X sex group are shown in Table 12.2. As the total sample (N = 1,261) ranged in age from 25 to 80 years, with a mean of 60 years in both racial groups, it was possible to estimate (by regression) the mean brain weight for each race X sex group at age 25 based on all of the data for each group (shown in the last column of Table 12.2). For the mean height-adjusted brain weight, the W-B difference in standard deviation units is 0.76s for males, 0.78s for females. (The actual height-adjusted W-B differences are 102 g for males and 95 g for females.) Neurologically, a difference of 100 g in brain weight corresponds to approximately 550 million cortical neurons. But this average estimate ignores any sex differences in brain size and density of cortical neurons.

Note that for each racial group the sexes differ in brain weight by about 130 g, which is about 30 g more than the average racial difference. This presents a paradox, because while brain size is correlated with IQ, there is little or no sex difference in IQ (even the largest IQ differences that have been claimed by anyone are much smaller than would be predicted by the sex difference in brain size). Attempts to explain this paradox amount to plausible speculations. One thing seems certain: Because of the small correlation (about .20) between brain size and body size, the sex difference in brain volume and weight can be only partially accounted for by the regression of brain size on body size. The resolution of this paradox may come from the evidence that females have a higher density of neurons in the posterior temporal cortex, which is the major association area and is involved in higher thought processes. Females have 11 percent more neurons per unit volume than do males, which, if true for the brain as a whole, would more than offset the 10 percent male-female difference in overall brain volume. This sex difference in neuronal packing density is considered a true sexual dimorphism, as are the sex differences in overall body size, skeletal form, the proportion and distribution of body fat, and other secondary sexual characteristics. Sexual dimorphism is seen throughout the animal kingdom and in many species is far more extreme than in *Homo sapiens*. I have not found any investigation of racial differences in neuron density that, as in the case of sex differences, would offset the racial difference in brain weight or volume. Until doubts on this point are empirically resolved, however, interpretations of the behavioral significance of the racial difference in brain size remain tentative. One indication that the race difference in brain weight is not of the same nature as the sex difference is that the allometric ratio of brain weight (in g) to body weight (in kg) is less similar between the racial groups than between the sexes within each racial group.

Also, we must take into account the fact that, on average, about 30 percent of total adult female body weight is fat, as compared to 15 percent for males. Because body fat is much less innervated than muscle tissue, brain size is more highly correlated with fat-free body weight than with total body weight. Statistically controlling for fat-free body weight (instead of total body weight) has been found to reduce the sex difference in head circumference by about 77 percent, or about three times as much as controlling for total body weight. Because head circumference is an imperfect proxy for brain size, the percentage reduction of the sex difference in directly measured brain volume (or weight) that would be achieved by controlling for fat-free weight will be uncertain until such studies are performed. Measuring fat-free body

weight should become routine in the conduct of brain-size studies based on autopsied brains or on in vivo brain measurements obtained by imaging techniques.

The white-black difference in head/brain size is significant in neonates (about 0.4s difference in head circumference) and within each racial group head size at birth is correlated (about +.13) with IQ at age seven years, when the average within-groups correlation with IQ is +.21. A retrospective study of two groups of seven-year-old children, those with IQ < 80 and those with IQ > 120 were found to have differed by 0.5s in head circumference measured at one year of age. Also, small head size measured at eight months has been found to interact most unfavorably with birth weight; infants with very low birth weight who had subnormal head size at eight months had an average IQ about nine points (0.6s) lower at school age than did infants of comparable birth weight but with normal head size (corrected for prematurity).

I have not found an estimate of the heritability of directly measured brain size. However, the heritability, h^2 , of cranial capacity (estimated by formula from head length, width, and circumference) based on Falconer's formula [$h^2=r_{MZ}-r_{DZ}$] applied to 107 MZ twin pairs and 129 DZ twin pairs ranged widely for different race X sex subgroups, for a within-subgroup average of .19. When the estimates of cranial capacity were adjusted for age, stature, and weight, the h^2 values averaged 0.53. The narrow h^2 (i.e., the proportion of the total variance attributable only to additive genetic effects) of various head measurements determined in a Caucasoid sample (Bulgarians) by the midparent X offspring correlation (all offspring over fifteen years of age) were: length .37, height .33, breadth .46, circumference .52. All of these estimates of the heritability of cranial size indicate a considerable amount of nongenetic (or environmental) variance, at least as much as for IQ. Moreover, much more of the nongenetic variance is within-families (i.e., unshared among siblings reared together) than is between-families (shared) variance. This implies that shared environmental effects, such as those associated with parents' education, occupation, and general socioeconomic level, are not the major source of variance in cranial capacity as estimated from head measurements. Also, what little evidence we have suggests that the total environmental variance in head measurements is greater for blacks than for whites. (The nature of these environmental influences is discussed later in this chapter.)

Implications of Brain Size for IQ Differences. Chapter 6 reviewed the major evidence showing that head measurements and brain size itself are significantly correlated with IQ. The only available correlations for blacks are based on head length, width, and circumference (and cranial capacity estimated by formula from these measurements); as yet there are no reported correlations between IQ and directly measured brain size for blacks. However, the head measurements are significantly correlated with IQ for age-matched whites and blacks, both on raw measurements and on measurements corrected for height and weight, although the correlations are somewhat lower in blacks. Longitudinal data show that the head circumference X IQ correlation significantly increases between ages 4 and 7, and cross-sectional data indicate that the correlation gradually increases up to 15 years of age, by which time the average growth

curves for head size and brain size have reached asymptote.

It is especially important to note that for both racial groups the head size X IQ correlation exists within-families as well as between-families, indicating an intrinsic, or functional, relationship, as explained in Chapter 6. Equally important is the fact that within each sex, whites and blacks share precisely one and the same regression line for the regression of head size on IQ. When blacks and whites are perfectly matched for true-score IQ (i.e., IQ corrected for measurement error), either at the black mean or at the white mean, the overall average W-B difference in head circumference is virtually nil, as shown in Table 12.3.

Taken together, these findings suggest that head size and IQ are similarly related to IQ for both blacks and whites. Although matching blacks and whites for IQ virtually eliminates the average difference in head size, matching the groups on head size does not equalize their IQs. This is what we in fact should expect if brain size is only one of a number of brain factors involved in IQ. When matched on IQ, the groups are thereby also equal on at least one of these brain factors, in this case, size. But when black and white groups are matched on head or brain size, they still differ in IQ, though to a lesser degree than in unmatched or representative samples of each population.

The black-white difference in head/brain size is also related to Spearman's hypothesis. A study in which head measurements were correlated (within racial groups) with each of seventeen diverse psychometric tests showed that the column vector of seventeen correlations was rank-order correlated + .64 ($p < .01$) with the corresponding vector composed of each test's g loading (within groups). In other words, a test's g loading significantly predicts the degree to which that test is correlated with head/brain size. We would also predict from Spearman's hypothesis that the degree to which each test was correlated with the head measurements should correlate with the magnitude of the W-B difference on each test. In fact, the column vector of test X head-size correlations and the vector of standardized mean W-B differences on each of the tests correlate + .51 ($p < .05$).

From the available empirical evidence, we can roughly estimate the fraction of the mean IQ difference between the black and white populations that could be attributed to the average difference in brain size. As noted in Chapter 6, direct measurements of in vivo brain size obtained by magnetic resonance imaging (MRI) show an average correlation with IQ of about + .40 in several studies based on white samples. Given the reasonable assumption that this correlation is the same for blacks, statistical regression would predict that an IQ difference equivalent to 1s would be reduced by 0.4s, leaving a difference of only 0.6s, for black and white groups matched on brain size. This is a sizable effect. As the best estimate of the W-B mean IQ difference in the population is equivalent to 1.1s or 16 IQ points, then $0.40 \times 16 = 6$ IQ points of the black-white IQ difference would be accounted for by differences in brain size. (Slightly more than 0.4s would predictably be accounted for if a hypothetically pure measure of g could be used.) Only MRI studies of brain size in representative samples of each population will allow

us to improve this estimate.

Other evidence of a systematic relationship between racial differences in cranial capacity and IQ comes from an "ecological" correlation, which is commonly used in epidemiological research. It is simply the Pearson r between the means of three or more defined groups, which disregards individual variation within the groups. Referring back to Table 12.1, I have plotted the median IQ of each of the three populations as a function of the overall mean cranial capacity of each population. The median IQ is the median value of all of the mean values of IQ reported in the world literature for Mongoloid, Caucasoid, and Negroid populations. (The source of the cranial capacity means for each group was explained in connection with Table 12.1.) The result of this plot is shown in Figure 12.4. The regression of median IQ on mean cranial capacity is almost perfectly linear, with a Pearson $r = +.998$. Unless the data points in Figure 12.4 are themselves highly questionable, the near-perfect linearity of the regression indicates that IQ can be regarded as a true interval scale. No mathematical transformation of the IQ scale would have yielded a higher correlation. Thus it appears that the central tendency of IQ for different populations is quite accurately predicted by the central tendency of each population's cranial capacity.

POPULATION DIFFERENCES IN g : THE DEFAULT HYPOTHESIS

Consider the following items of evidence: the many biological correlates of g ; the fact that among all of the psychometric factors in the domain of cognitive abilities the g factor accounts for the largest part of the mean difference between blacks and whites; the evolutionary history of *Homo sapiens* and the quantitative differentiation of human populations in allele frequencies for many characteristics, including brain size, largely through adaptive selection for fitness in highly varied climates and habitats; the brain evolved more rapidly than any other organ; half of humans' polymorphic genes affect brain development; the primary evolutionary differentiation and largest genetic distance between human populations is that between the African populations and all others; the intrinsic positive correlation between brain size and measures of g ; the positive mean white-black difference in brain size; the positive correlation between the variable heritability of individual differences in various measures of cognitive abilities and the variable magnitudes of their g loadings. All these phenomena, when viewed together, provide the basis for what I shall call the default hypothesis concerning the nature of population or racial differences in g .

Although we are concerned here with variation between populations, it is also important to keep in mind that, from an evolutionary perspective, it is most unlikely that there are intraspecies differences in the basic structural design and operating principles of the brain. The main structural and functional units of the brain found in any one normal human being should be validly generalizable to all other normal humans. That is to say, the processes by which the brain perceives, learns, reasons, remembers, and the like are the same for everyone, as are the essential structures and functions of every organ system in the entire body. Individual differences and population differences in normal brain processes exist at a different level,

superimposed, as it were, over and above the brain's common structures and operating principles.

The default hypothesis states that human individual differences and population differences in heritable behavioral capacities, as products of the evolutionary process in the distant past, are essentially composed of the same stuff, so to speak, controlled by differences in allele frequencies, and that differences in allele frequencies between populations exist for all heritable characteristics, physical or behavioral, in which we find individual differences within populations.

With respect to the brain and its heritable behavioral correlates, the default hypothesis holds that individual differences and population differences do not result from differences in the brain's basic structural operating mechanisms per se, but result entirely from other aspects of cerebral physiology that modify the sensitivity, efficiency, and effectiveness of the basic information processes that mediate the individual's responses to certain aspects of the environment. A crude analogy would be differences in the operating efficiency (e.g., miles per gallon, horsepower, maximum speed) of different makes of automobiles, all powered by internal combustion engines (hence the same operating mechanisms) but differing in, say, the number of cylinders, their cubic capacity, and the octane rating of the gasoline they are using. Electric motor cars and steam-engine cars (analogous to different species or genera) would have such distinctively different operating mechanisms that their differences in performance would call for quite different explanations.

In brief, the default hypothesis states that the proximal causes of both individual differences and population differences in heritable psychological traits are essentially the same, and are continuous variables. The population differences reflect differences in allele frequencies of the same genes that cause individual differences. Population differences also reflect environmental effects, as do individual differences, and these may differ in frequency between populations, as do allele frequencies.

In research on population differences in mean levels of g, I think that the default hypothesis should be viewed as the true "null" hypothesis, that is, the initial hypothesis that must be disproved. The conventional null hypothesis of inferential statistics (i.e., no differences between populations) is so improbable in light of evolutionary knowledge as to be scientifically inappropriate for the study of population differences in any traits that show individual differences. The real question is not whether population differences exist for a given polygenic trait, but rather the direction and magnitude of the difference.

The question of direction of a difference brings up another aspect of the default hypothesis, namely, that it is rare in nature for genotypes and phenotypes of adaptive traits to be negatively correlated. It is exceedingly improbable that racial populations, which are known to differ, on average, in a host of genetically conditioned physical characteristics, would not differ in any of

the brain characteristics associated with cognitive abilities, when half of all segregating genes in the human genome are involved with the brain. It is equally improbable that heritable variation among individuals in polygenic adaptive traits, such as g , would not show nontrivial differences between populations, which are aggregations of individuals. Again, from a scientific standpoint, the only real questions about population differences concern their direction, their magnitude, and their causal mechanism(s). One may also be interested in the social significance of the phenotypic differences. Research will be most productively focused not on whether or not genes are involved in population differences, but in discovering the relative effects of genetic and environmental causes of differences and the nature of these causes, so they can be better understood and perhaps influenced.

The rest of this chapter deals only with the scientific aspect of the default hypothesis. (For a discussion of its social significance, see Chapter 14.) Since far more empirical research relevant to the examination of the default hypothesis with respect to g has been done on the black-white difference, particularly within the United States, than on any other populations, I will focus exclusively on the causal basis of the mean black-white difference in the level of g .

HERITABILITY OF IQ WITHIN GROUPS AND BETWEEN GROUPS

One of the aims of science is to comprehend as wide a range of phenomena as possible within a single framework, using the fewest possible mechanisms with the fewest assumptions and ad hoc hypotheses. With respect to IQ, the default hypothesis relating individual differences and population differences is consistent with this aim, as it encompasses the explanation of both within-group (WG) and between-group (BG) differences as having the same causal sources of variance. The default hypothesis that the BG and WG differences are homogeneous in their causal factors implies that a phenotypic difference of PD between two population groups in mean level of IQ results from the same causal effects as does any difference between individuals (within either of the two populations) whose IQs differ by PD (i.e., the phenotypic difference). In either case, PD is the joint result of both genetic (G) and environmental (E) effects. In terms of the default hypothesis, the effects of genotype X environment covariance are the same between populations as within populations. The same is hypothesized for genotype x environment interaction, although studies have found it contributes negligibly to within-population variance in g .

It is possible for a particular allele to be present in one population but absent in another, or for alleles at certain loci to be turned on in some environments and turned off in others, or to be regulated differently in different environments. These conditions would constitute exceptions to the default hypothesis. But without empirical evidence of these conditions with respect to population differences in g , which is a highly polygenic trait in which most of the variance within (and probably between) populations is attributable to quantitative differences in allele frequencies at many loci, initial investigation is best directed at testing the default hypothesis.

In terms of the black-white IQ difference, the default hypothesis means that the question of why (on average) two whites differ by amount PD in IQ, or two blacks differ by amount PD or a black and a white differ by amount PD can all be answered in the same terms. There is no need to invoke any special "racial" factor, either genetic or cultural.

The countervailing dual hypothesis contends that: (1) within-group individual differences (WG), on the one hand, and between-group mean differences (BG), on the other, have different, independent causes; and (2) there is no relationship between the sources of WG differences and of BG differences. In this view, the high heritability of individual differences in g within groups tells us nothing about the heritability (if any) of g between groups.

The empirical fact that there is a large genetic component in WG individual differences in g is so well established by now (see Chapter 7) that, with rare exceptions, it is no longer challenged by advocates for the dual hypothesis. The defining tenet of the dual hypothesis, at least as it applies to the phenotypic black-white IQ difference, is that there is no genetic component in the mean BG difference; that is, the causes of the observed BG difference in IQ are entirely environmental. These environmental sources may include nutrition and other biological conditions, as well as socioeconomic, attitudinal, or cultural group differences, to name the most frequently hypothesized causal factors. (Psychometric test bias, as such, has been largely ruled out; see Chapter 11, pp. 360-67.)

Within-Group Heritability of IQ in Black and in White Groups. Before contrasting the dual and the default hypotheses in terms of their formal implications and their consistency with empirical findings, we need to understand what is, and is not, known about the heritability of individual differences in IQ within each population.

The many studies of IQ heritability based on white samples are summarized in Chapter 7. They give estimates that range mostly between .40 and .60 for children and adolescents, and between .60 and .80 for adults.

The few studies of IQ heritability in black samples have all been performed in conjunction with age-matched white samples, so that group comparisons would be based on the same tests administered under the same conditions. Only two such studies based on large samples (total Ns of about 300 and 700) of black and white twins of school age have been reported. The data of these studies do not support rejection of the null hypothesis of no black-white difference in the heritability coefficients for IQ. Nor do these studies show any evidence of a statistically significant racial difference between the magnitudes of the correlations for either MZ or DZ twins. But the sample sizes in these studies, though large, are not large enough to yield statistical significance for real, though small, group differences. The small differences between the black and white twin correlations observed in these studies are, however, consistent with the black-white differences in the correlations, between full siblings found in a study of all of the school-age sibling pairs in the total black and white populations of the seventeen elementary schools of

Berkeley, California. The average sibling correlations for IQ in that study were +.38 for blacks and +.40 for whites. (For height, the respective age-corrected correlations were .45 and .42.) Because the samples totaled more than 1,500 sibling pairs, even differences as small as .02 are statistically significant. If the heritability of IQ, calculated from twin data, were very different in the black and white populations, we would expect the difference to show up in the sibling correlations as well. The fact that sibling correlations based on such large samples differ so little between blacks and whites suggests that the black-white difference in IQ heritability is so small that rejection of the null hypothesis of no W-B difference in IQ heritability would require enormous samples of black and white MZ and DZ twins- far more than any study has yet attempted or is ever likely to attempt. Such a small difference, even if it were statistically reliable, would be of no theoretical or practical importance. On the basis of the existing evidence, therefore, it is reasonable to conclude that the difference between the U.S. black and white populations in the proportion of within-group variance in IQ attributable to genetic factors (that is, the heritability of IQ) is probably too small to be detectable.

The Relationship of Between-Group to Within-Group Heritability.

The mantra invoked to ward off any unpalatable implications of the fact that IQ has substantially equal heritability in both the black and the white populations is that "heritability within groups does not imply (or prove, or generalize to) heritability between groups." Arguing that the fact that there is genetic variance in individual differences within groups gives no warrant to generalize to differences between groups is, of course, formally equivalent to saying exactly the same thing about environmental variance, which is the complement of the within-groups heritability (i.e., $1-h^2$). But a little analysis is required to understand the peculiar nature of the relationship between within-group heritability (WGH) and between-group heritability (BGH).

To say there is no relationship of any kind between WGH and BGH is wrong. They are mathematically related according to the following equation:

$BGH = WGH * (r_g(1-r_p) / r_p(1-r_g))$ where BGH is the between-group heritability and WGH is the within-group heritability. r_g is the genetic intraclass correlation within groups, i.e., $r_g = (\text{genetic variance between groups}) / (\text{genetic variance between groups} + \text{genetic variance within groups})$. r_p is the phenotypic intraclass correlation within groups; it is equal to the squared point-biserial correlation between individuals' nominal group membership (e.g., black or white, quantitized as 0 or 1) and the quantitative variable of interest (e.g., IQ).

This is termed the formal relationship between WGH and BGH. Although there is no argument about the mathematical correctness of this formulation, it is not empirically applicable, because a single equation containing two unknowns (i.e., BGH and r_g), cannot be solved. (It is also clear mathematically that the formula must assume that WGH is greater than zero and that r_g is less than unity.) The value of r_p can easily be obtained empirically. (For example, if two groups each have the same standard deviation on a given variable and the group means differ by one such

standard deviation, the value of $r_p = .20$). If we knew the value of r_g we could solve the equation for BGH (or vice versa). (If the between-groups difference were entirely nongenetic, as strict environmentalists maintain, then of course r_g would be zero.) But we know neither r_g nor BGH, so the formula is empirically useless.

However, this formula does indicate that for an hypothesized value of r_g greater than zero, BGH is a linearly increasing function of WGH. As I will point out, the hypothesized relationship between WGH and BGH can suggest some useful conjectures and empirical analyses. The formal relationship between WGH and BGH makes no assumptions about the sources of either the genetic or the environmental variance in BGH and WGH, or whether BGH and WGH are qualitatively the same or different in this respect. The default hypothesis, however, posits that the genetic and the environmental factors that cause the between-groups difference exist within each group (but not necessarily in equal degrees). The opposing dual hypothesis is that the environmental factors that cause variance between groups are different not just in degree, but in kind, from the environmental factors that cause individual differences within a group. This conjecture raises problems that I will examine shortly.

The between-groups (BG) versus within-groups (WG) problem can be visualized as shown in Figure 12.5. Assume a population is composed of two equal-sized subpopulations, A and B, and assume that on some characteristic (e.g., IQ) the phenotypic means of these two subpopulations differ, that is, $A - B = PD$. (Sampling error and measurement error are assumed to be zero in this didactic diagram.) The measurement of the phenotypic characteristic (P) is standardized in the total population, so its population standard deviation is $1s$ and the total variance is the square of the standard deviation, $1s^2$. Any variance can be visualized as the area of a square. The square in Figure 12.5 represents the total phenotypic variance ($1s^2$) of the whole population, and its square root is the standard deviation ($1s$) of the phenotypic measurements. The total variance (area of the square) is partitioned horizontally into the variance between groups (BG) and the variance within groups (WG). The total variance is partitioned vertically into the genetic (G) variance, i.e., heritability (h^2) and the environmental (E) variance, i.e., environmentality (e^2). At present, the only variables we are able to determine empirically are the total phenotypic variance, h^2WG , and the within-group genetic and environmental variances, h^2WG , and e^2WG . The between-group variables, h^2BG and e^2BG , are undetermined (and so are shown in parentheses). As the genetic and environmental proportions of the BG variance have not been empirically determined, they are shown separated by a dotted line in Figure 12.5. This dotted line could move either to the left or to the right, based on new empirical evidence. Its approximate position is the bone of contention between the advocates of the default hypothesis and those of the conventional null hypothesis.

Extreme "environmentalists" argue that both $h^2WG=0$ and $h^2BG=0$, leaving environmental agents as the source of all observed phenotypic variance. (Hardly anyone now holds this position with respect to IQ.) A much more common position nowadays is to accept the empirically established WG values, but maintain that the BG variance is all environmental.

"Agnostics" would say (correctly) that h^2_{BG} is not empirically known, and some might add that, though unknown, it is plausibly greater than zero.

The strong form of the default hypothesis is represented in Figure 12.5 by the dotted-line extension of the solid vertical line, thus partitioning both the WG and BG variances into the same proportions of genetic and environmental variance. A "relaxed" form of the default hypothesis still posits $h^2_{BG} > 0$, but allows h^2_{BG} to differ from h^2_{WG} . In general, this is closer to reality than is the strong form of the default hypothesis. In both forms of the default hypothesis

WG variance and BG variance are attributable to the same causal factors, although they may differ in degree. The purpose of hypothesizing some fairly precise value for h^2_{BG} is not because one necessarily thinks it is true, or wants to "sell" it to someone, but rather because scientific knowledge advances by the process that Karl Popper described as "conjectures and refutations"-a strong hypothesis (or conjecture) can permit certain possibly testable deductions or inferences, and can be decisively refuted only if formulated precisely and preferably quantitatively. Any hypothesis is merely the temporary scaffolding that assists in discovering new facts about nature. It helps us to formulate questions precisely and further focuses investigative efforts on research that will yield diacritical results. Beyond this purpose, a hypothesis has no other use. It is not a subject for advocacy.

A clear quantitative statement of the default hypothesis depends upon understanding some important technical points about variance and its relation to linear measurement. The large square in Figure 12.6 represents the total variance (0.2) of a standardized phenotypic variable (P), with a standard deviation $s_P = 1$. The area of the large square (total phenotypic variance) is partitioned into its genetic and environmental components, corresponding to a heritability of .75 (which makes it easy to visualize). The genetic variance s^2_{G2} in Figure 12.6 (unshaded area) is equal to .75, leaving the environmental component s^2_{E2} (shaded area) equal to .25. Since the variance of each effect is shown in the diagram as an area, the square root of the area represents the standard deviation of that effect. The linear distances or differences between points on a scaled variable are shown as line segments scaled in standard deviation units, not in variance units. Thus the line segments that form the area in the lower right of the shaded square in Figure 12.6 are each equal to $0.25^{0.5}$ or .5 (in standard deviation units). The linear distances represented by the environmental variance is 0.5; and the linear distance represented by the genetic variance is 0.866. Notice that these two linear measurements do not add up to the length of the side of the total square, which is 1. That is, standard deviation units are not additive. Before the sum of the standard deviations of two or more component elements can represent the standard deviation of the total of the component elements, you must first take the square root of the sum of the squared standard deviations.

[From this point on -- I have eliminated many hard to edit formulas. See the original text for the complete derivations of expressions]

We can now ask, "How many units of environmental variance are needed to add up to the total phenotypic variance? The answer is 4. This ratio is in variance units. To express it in linear terms, it has to be converted into standard deviation units, that is, 2.

Suppose we obtain IQ scores for all members of two equal-size groups called A and B. Further assume that within each group the IQs have a normal distribution, and the mean of group A is greater than the mean of group B. To keep the math simple, let the IQ scores have perfect reliability, let the standard deviation of the scores be the same in both groups, and let the mean phenotypic difference be equal to the average within-group phenotypic standard deviation.

Now consider the hypothesis that the between-group heritability (BGH) is zero and that therefore the cause of the A-B difference is purely environmental. Assume that the within-group heritability (WGH) is the same in each group, say, $WGHA = WGHB = .75$. Now, if we remove the variance attributable to genetic factors (WGH) from the total variance of each group's scores, the remainder gives us the proportion of within-group variance attributable to purely environmental factors. If both the genetic and environmental effects on test scores are normally distributed within each group, the resulting curves after the genetic variance has been removed from each represent the distribution of environmental effects on test scores. Note that this does not refer to variation in the environment per se, but rather to the effects of environmental variation on the phenotypes (i.e., IQ scores, in this case.) The standard deviation of this distribution of environmental effects provides a unit of measurement for environmental effects.

The distribution of just the total environmental effects (assuming $WGH = .75$) is shown in the two curves in the bottom half of Figure 12.7. The phenotypic difference between the group means is kept constant, but on the scale of environmental effects (measured in environmental standard deviation units), the mean environmental effects for groups A and B differ by the ratio $2sE$, as shown in the lower half of Figure 12.7. What this means is that for two groups to differ phenotypically by $1sP$ When $WGH = .75$ and $BGH = 0$, the two groups would have to differ by $2sE$ on the scale of environmental effects. This is analogous to two groups in which each member of one group has a monozygotic twin in the other group, thus making the distribution of genotypes exactly the same in both groups. For the test score distributions of these two genotypically matched groups to differ by $1sP$, the groups would have to differ by $2sE$ on the scale of environmental effects (assuming $WGH = .75$).

The hypothetical decomposition of a mean phenotypic difference between two groups as expressed in terms of the simplest model is that the phenotypic difference between the groups is completely determined by their genetic difference and their environmental difference. These variables are related quantitatively by the simple path model shown in Figure 12.8. The arrows represent the direction of causation; each arrow is labeled with the respective regression coefficients (also called path coefficients), h and e , between the variables, which, when, are mathematically equivalent to the respective correlation coefficients, and to the standard deviations of the genetic and environmental effects. In reality, of course, there could be a causal

path, but this would not alter the essential point of the present argument. We see that the phenotypic difference can be represented as a weighted sum of the genetic and the environmental effects on PD, the weights being h and e . Since these values are equivalent to standard deviations, they cannot be summed.

A phenotypic difference between the means of two groups can be expressed in units of the standard deviation of the average within-groups environmental effect, where BGH is the between-groups heritability and WGH is the within-groups heritability. Thus the phenotypic difference between the means of the two curves in the lower half of Figure is $2sE$. That is, the means of the two environmental-effect curves differ by two standard deviations. The body of empirical evidence shows that an environmental effect on IQ this large would predictably occur only rarely in pairs of monozygotic twins reared apart (whose IQs are correlated .75) except for random errors of measurement. The difference in IQ attributable solely to nongenetic differences between random pairs of individuals in a population in which h^2 is .75 is about the same as for MZ twins reared apart. On an IQ scale with $s = 15$, a difference of $2sE$ is approximately equal to 30 IQ points (i.e., 2×15). But the largest IQ difference between MZ twins reared apart reported in the literature is $1.5s$, or 23 IQ points. Further, the average absolute difference in IQ (assuming a perfectly normal distribution of IQ) between all random pairs of persons in the population (who differ both in g and in E) would be $1.1284s$, or approximately 17 IQ points.

Now consider again the two groups in the upper half of Figure 12.7, called A and B. They differ in their mean test scores, with a phenotypic difference $A-B = 1sP$, and have a within-group environmental effect difference of $2sE$. If we hypothesize that the difference between the phenotypic means is entirely nongenetic (i.e., environmental), then the phenotypic difference of $1sP$ must be equal to $2sE$.

By the same reasoning, we can determine the size of the environmental effect that is required to produce a phenotypic difference of $1sP$, given any values of the within-groups heritability (WGH) and the between-groups heritability (BGH). For a phenotypic difference of $1sP$. The strong default hypothesis is defined in terms of $BGH = WGH$; the relaxed default hypothesis allows independent values of BGH and WGH.

For example, in the first column inside Table 12.4(A), the $BGH = .00$. This represents the hypothesis that the cause of the mean group difference in test scores is purely environmental. When WGH is also equal to $.00$, the environmental difference of $1sE$ between the groups accounts for all of the phenotypic difference of $1sP$, and thus accords perfectly with the environmental hypothesis that $1sP = 1sE$. Table 12.4(A) shows that when $WGH = BGH = .00$, the value of $sE = 1.00$.

Maintaining the same purely environmental hypothesis that the $BGH = 0$, but with the $WGH = .10$, for two groups to differ phenotypically by $1sP$ they must differ by $1.05sE$ in environmental

effect, which deviates .05 from the hypothesized value of $1sE$. The critical point of this analysis is that if the $BGH = 0$, values of WGH greater than 0 then require that sE be greater than 1.00. We can see in Table 12.4(A) that as the WGH increases, the required value of $1sE$ must increasingly deviate from the hypothesized value of $1sE$, thereby becoming increasingly more problematic for empirical explanation. Since the empirical value of WGH for the IQ of adults lies within the range of .60 to .80, with a mean close to .70, it is particularly instructive to examine the values of $1sE$, for this range in WGH . When $WGH = .70$ and $BGH = 0$, for example, the $1sP$, difference between the groups is entirely due to environmental causes and amounts to $1.83sE$. Table 12.4(A) indicates that as we hypothesize levels of BGH that approach the empirically established levels of WGH , the smaller is the size of the environmental effect required to account for the phenotypic difference of $1sP$ in group means.

Factor X. Recall that the strong form of the default hypothesis states that the average difference in test scores observed between groups A and B results from the same kinds of genetic (G) and environmental (E) influences acting to the same degree to produce individual differences within each group. The groups may differ, however, in the mean values of either G, or E, or both. Stated in terms of the demonstration in Table 12.4(A), this means that if WGH is the same for both groups, A and B, then, given any empirically obtained value of WGH , the limits of BGH are constrained, as shown. The hypothesis that $BGH = 0$ therefore appears improbable, given the typical range of empirical values of WGH .

To accept the preponderance of evidence that $WGH > 0$ and still insist that $BGH = 0$ regardless of the magnitude of the WGH , we must attribute the cause of the group difference to either of two sources: (1) the same kinds of environmental factors that influence the level of g but that do so at much greater magnitude between groups than within either group, or (2) empirically identified environmental factors that create variance between groups but do not do so within groups. The "relaxed" default hypothesis allows both of these possibilities. The dual hypothesis, on the other hand, requires either much larger environmental effects between groups than are empirically found, on average, within either group, or the existence of some additional empirically unidentified source of nongenetic variance that causes the difference between groups but does not contribute to individual differences within either group. If the two groups are hypothesized not to differ in WGH or in total phenotypic variance, this hypothesized additional source of nongenetic variance between groups must either have equal but opposite effects within each group, or it must exist only within one group but without producing any additional variance within that group. In 1973, I dubbed this hypothesized additional nongenetic effect Factor X. When groups of blacks and whites who are matched on virtually all of the environmental variables known to be correlated with IQ within either racial population still show a substantial mean difference in IQ, Factor X is the favored explanation in lieu of the hypothesis that genetic factors, though constituting the largest source of variance within groups, are at all involved in the IQ difference between groups. Thus Factor X is an ad hoc hypothesis that violates Occam's razor, the well-known maxim in science which states that if a phenomenon can be explained without assuming some hypothetical entity, there is no ground for assuming it.

The default hypothesis also constrains the magnitude of the genetic difference between groups, as shown in Table 12.4(B). (The explanations that were given for interpreting Table 12.4(A) apply here as well.) For two groups, A and B, whose phenotypic means differ by $A-B = l_sP$, the strong default hypothesis (i.e., $BGH = WGH$) means that the groups differ on the scale of genetic effect by $BGH/WGH = l_sG$.

The values of l_sG in Table 12.4(B) show that the strong default hypothesis is not the same as a purely genetic hypothesis of the group difference. For example, for $WGH = .70$ and $BGH = .70$, the groups differ by l_sG (Table 12.4B), and also the groups differ by l_sE (Table 12.4A). For the relaxed default hypothesis, the environmental and genetic differences associated with each and every intersection of WGH and BGH in Tables 12.4A and 12.4B add up to l_sP .

The foregoing analysis is relevant to the often repeated "thought experiment" proposed by those who argue for the plausibility of the dual hypothesis, as in the following example from an article by Carol Tavris: "Suppose that you have a bag of tomato seeds that vary genetically; all things being equal, some seeds will produce tomatoes that are puny and tasteless, and some will produce tomatoes that are plump and delicious. You take a random bunch of seeds in your left hand and random bunch in your right. Though one seed differs genetically from another, there is no average difference between the seeds in your left hand and those in your right. Now you plant the left hand's seeds in Pot A. You have doctored the soil in Pot A with nitrogen and other nutrients. You feed the pot every day, sing arias to it from La Traviata, and make sure it gets lots of sun. You protect it from pests, and you put in a trellis, so even the weakest little tomatoes have some support. Then you plant the seeds in your right hand in Pot B, which contains sandy soil lacking nutrients. You don't feed these tomatoes, or water them; you don't give them enough sun; you let pests munch on them. When the tomatoes mature, they will vary in size within each pot, purely because of genetic differences. But there will also be an average difference between the tomatoes of enriched Pot A and those of depleted Pot B. This difference between pots is due entirely to their different soils and tomato-rearing experiences."

Statistically stated, the argument is that (1) $WGH = 1$, $BGH = 0$. What is the expected magnitude of the required environmental effect implied by these conditions? In terms of within-group standard deviation units, it is $sE = 1/0$. But of course the quotient of any fraction with zero in the denominator is undefined, so no inference about the magnitude is possible at all, given these conditions. However, if we make the WGH slightly less than perfect, say, $.99$, the expected difference in environmental effect becomes l_0sE . This is an incredibly large, but in this case probably not unrealistic, effect given Tavris's descriptions of the contrasting environments of Pot A and Pot B.

The story of tomatoes-in-two-pots doesn't contradict the default hypothesis. Rather, it makes the very point of the default hypothesis by stating that Pots A and B each contain random samples of the same batch of seeds, so an equally massive result would have been observed if the left-hand and right-hand seeds had been planted in opposite pots. Factor X is not needed to explain

the enriched and deprived tomatoes; the immense difference in the environmental conditions is quite sufficient to produce a difference in tomato size ten times greater than the average differences produced by environmental variation within each pot.

Extending the tomato analogy to humans, Tavaris goes on to argue, "Blacks and whites do not grow up, on the average, in the same kind of pot". The question, then, is whether the average environmental difference between blacks and whites is sufficient to cause a $1sP$ difference in IQ if $BGH = 0$ and WGH is far from zero. The default hypothesis, positing values of BGH near those of the empirical values of WGH , is more plausible than the hypothesis that $BGH = 0$. (A third hypothesis, which can be ruled out of serious consideration on evolutionary grounds, given the observed genetic similarity between all human groups, is that the basic organization of the brain and the processes involved in mental development are qualitatively so different for blacks and whites that any phenotypic difference between the groups cannot, even in principle, be analyzed in terms of quantitative variation on the same scale of the genetic or of the environmental factors that influence individual development of mental ability within one racial group.)

The Default Hypothesis in Terms of Multiple Regression. The behavioral geneticist Eric Turkheimer has proposed an approach for relating the quantitative genetic analysis of individual and of group differences. Phenotypic variance can be conceptually partitioned into its genetic and its environmental components in terms of a multiple regression equation. Turkheimer's method allows us to visualize the relationship of within-group and between-group genetic effects and environmental effects in terms of a regression plane located in a three-dimensional space in which the orthogonal dimensions are phenotype (P), genotype (G), and environment (E). Both individual and group mean phenotypic values (e.g., IQ) can then be represented on the surface of this plane. This amounts to a graphic statement of the strong default hypothesis, where the phenotypic difference between two individuals (or two group means), A and B , can be represented by the multiple regression of the phenotypic difference on the genetic and environmental differences (GD and ED).

According to the default hypothesis, mental development is affected by the genetic mechanisms of inheritance and by environmental factors in the same way for all biologically normal individuals in either group. (Rejection of this hypothesis would mean that evolution has caused some fundamental intraspecies differences in brain organization and mental development, a possibility which, though seemingly unlikely, has not yet been ruled out.) Thus the default hypothesis implies that a unit increase in genetic value G for individuals in group A is equal to the same unit increase in G for individuals in group B , and likewise for the environmental value E . Within these constraints posited by the default hypothesis, however, the groups may differ, on average, in the mean values of G , or E , or both. Accordingly, individuals of either group will fall at various points (depending on their own genotype and environment) on the same regression lines (i.e., for the regression of P on G and of P on E). This can be visualized graphically as a regression plane inside a square box (Figure 12.9). The G and E values for

individuals (or for group means) A and B are projected onto the tilted plane; the projections are shown as a dot and a square. Their positions on the plane are then projected onto the phenotype dimension of the box.

The important point here is that the default hypothesis states that, for any value of WGH, the predicted scores of all individuals (and consequently the predicted group means) will lie on one and the same regression plane. Assuming the default hypothesis, this clearly shows the relationship between the heritability of individual differences within groups (WGH) and the heritability of group differences (BGH). This formulation makes the default hypothesis quantitatively explicit and therefore highly liable to empirical refutation. If there were some environmental factor(s) that is unique to one group and that contributes appreciably to the mean difference between the two groups, their means would not lie on the same plane. This would result, for example, if there were a between-groups G X E interaction. The existence of such an interaction would be inconsistent with the default hypothesis, because it would mean that the groups differ phenotypically due to some nonadditive effects of genes and environment so that, say, two individuals, one from each group, even if they had identical levels of IQ, would have had to attain that level by different developmental processes and environmental influences. The fact that significant G X E interactions with respect to IQ (or g) have not been found within racial groups renders such an interaction between groups an unlikely hypothesis.

It should be noted that the total nongenetic variance has been represented here as e^2 . As explained in Chapter 7, the true-score nongenetic variance can be partitioned into two components: between-families environment (BFE is also termed shared environment because it is common to siblings or to any children reared together) and within-family environment (WFE, or unshared environment, that part of the total environmental effect that differs between persons reared together).

The WFE results largely from an accumulation of more or less random microenvironmental factors. We know from studies of adult MZ twins reared apart and studies of genetically unrelated adults who were reared together from infancy in adoptive homes that the BFE has little effect on the phenotype of mental ability, such as IQ scores, even over a quite wide range of environments (see Chapter 7 for details). The BF environment certainly has large effects on mental development for the lowest extreme of the physical and social environment, conditions such as chronic malnutrition, diseases that affect brain development, and prolonged social isolation, particularly in infancy and early childhood. These conditions occur only rarely in First World populations. But some would argue that American inner cities are Third World environments, and they certainly resemble them in some ways. On a scale of environmental quality with respect to mental development, these adverse environmental conditions probably fall more than 2s below the average environment experienced by the majority of whites and very many blacks in America. The hypothetical function relating phenotypic mental ability (e.g., IQ) on the total range of BFE effects (termed the reaction range or reaction norm for the total environmental effect) is shown in Figure 12.10.

Pseudo-race Groups and the Default Hypothesis. In my studies of test bias, I used what I termed pseudo-race groups to test the hypothesis that many features of test performance are simply a result of group differences in the mean and distribution of IQ per se rather than a result of any cultural differences between groups. Pseudo-race groups are made up entirely of white subjects. The standard group is composed of individuals selected on the basis of estimated true-scores so as to be normally distributed, with a mean and standard deviation of the IQ distribution of whites in the general population. The pseudo-race group is composed of white individuals from the same population as the standard group, but selected on the basis of their estimated true-scores so as to be normally distributed, but with a mean and standard deviation of the IQ distribution of blacks in the general population. The two groups, with age controlled, are intentionally matched with the white and black populations they are intended to represent only on the single variable of interest, in this case IQ (or preferably g factor scores). Therefore, the groups should not differ systematically on any other characteristics, except for whatever characteristics may be correlated with IQ. Estimated true-scores must be used to minimize the regression (i.e., toward the white mean of 100) effect that would otherwise result from selecting white subjects on IQ so as to form a group with a lower mean IQ than that of the population from which they were selected.

The creation of two groups that, in this manner, are made to differ on a single trait can be viewed as another model of the strong default hypothesis. This method is especially useful in empirically examining various nonpsychometric correlates of the standard group versus pseudo-race group difference. These differences can then be compared against any such differences found between representative samples of the actual white and black populations. The critical question is, in the circumstances of daily life how closely does the behavior of the pseudo-race group resemble that of a comparable sample of actual blacks? The extent of the pseudo-race versus actual race difference in nonpsychometric or "real-life" behavior would delimit the g factor's power to account for the observed racial differences in many educationally, occupationally, and socially significant variables.

Notice that the standard and pseudo-race groups would perfectly simulate the conditions of the strong default hypothesis. Both genetic and environmental sources of variance exist in nearly equal degrees within each group, and the mean difference between the groups necessarily comprises comparable genetic and environmental sources of variance. If this particular set of genetic and environmental sources of IQ variance within and between the standard and pseudo-race groups simulates actual white-black differences in many forms of behavior that have some cognitive aspect but are typically attributed solely to cultural differences, it constitutes strong support for the default hypothesis. Experiments of this type could tell us a lot and should be performed.

EMPIRICAL EVIDENCE ON THE DEFAULT HYPOTHESIS

Thus far the quantitative implications of the default hypothesis have been considered only in

theoretical or formal terms, which by themselves prove nothing, but are intended only to lend some precision to the statement of the hypothesis and its predicted empirical implications. It should be clear that the hypothesis cannot feasibly be tested directly in terms of applying first-order statistical analyses (e.g., the t test or analysis of variance applied to phenotypic measures) to determine the BGH of a trait, as is possible in the field of experimental genetics with plants or animals. In the latter field, true breeding experiments with cross-fostering in controlled environments across different subspecies and subsequent measurement of the phenotypic characteristics of the progeny of the cross-bred strains for comparison with the same phenotypes in the parent strains are possible and, in fact, common. In theory, such experiments could be performed with different human subspecies, or racial groups, and the results (after replications of the experiment to statistically reduce uncertainty) would constitute a nearly definitive test of the default hypothesis. An even more rigorous test of the hypothesis than is provided by a controlled breeding and cross-fostering experiment would involve in vitro fertilization to control for possible differences in the prenatal environment of the cross-fostered progeny. Such methods have been used in livestock breeding for years without any question as to the validity of the results. But, of course, for ethical reasons the methods of experimental genetics cannot be used for research in human genetics. Therefore, indirect methods, which are analytically and statistically more complex, have been developed by researchers in human genetics.

The seemingly intractable problem with regard to phenotypic group differences has been the empirical estimation of the BGH. To estimate the genetic variance within groups one needs to know the genetic kinship correlations based on the theoretically derived proportions of alleles common to relatives of different degrees (e.g., MZ twins = 1.00, DZ twins and full siblings, parent-child = 0.50 [or more with assortative mating, half-siblings = 0.25, first cousins = .125, etc.). These unobserved but theoretically known genetic kinship correlations are needed as parameters in the structural equations used to estimate the proportion of genetic variance (heritability) from the phenotypic correlations between relatives of different degrees of kinship. But we generally do not have phenotypical correlations between relatives that bridge different racial groups. Since few members of one racial group have a near relative (by common descent) in a different racial group, we don't have the parameters needed to estimate between-group heritability. Although interracial matings can produce half-siblings and cousins who are members of different racial groups, the offspring of interracial matings are far from ideal for estimating BGH because, at least for blacks and whites, the parents of the interracial offspring are known to be unrepresentative of these populations. Thus such a study would have doubtful generality.

An example of cross-racial kinships that could be used would be a female of group A who had two offspring by a male of group A and later had two offspring by a male of group B, resulting finally in two pairs of full-siblings who are both AA and two pairs of half-siblings who are both AB. A biometric genetic analysis of phenotypic measurements obtained on large samples of such full-siblings and half-siblings would theoretically afford a way of estimating both WGH and BGH. Again, however, unless such groups arose from a controlled breeding experiment, the

resulting estimate of BGH would probably not be generalizable to the population groups of interest but would apply only to the specific groups used for this determination of BGH (and other groups obtained in the same way). There are two reasons: First, the degree of assortative mating for IQ is most likely the same, on average, for interracial and intraracial matings; that is, the A and B mates of the hypothetical female in our example would probably be phenotypically close in IQ, so at least one of them would be phenotypically (hence also probably genetically) unrepresentative of his own racial population. Therefore, the mixed offspring AB are not likely to differ genetically much, if at all, on average, from the unmixed offspring AA. Second, aside from assortative mating, it is unlikely that interracial half-siblings are derived from parents who are random or representative samples of their respective racial populations. It is known, for example, that present-day blacks and whites in interracial marriages in the United States are not typical of their respective populations in IQ related variables, such as levels of education and occupation.

How then can the default hypothesis be tested empirically? It is tested exactly as is any other scientific hypothesis; no hypothesis is regarded as scientific unless predictions derived from it are capable of risking refutation by an empirical test. Certain predictions can be made from the default hypothesis that are capable of empirical test. If the observed result differs significantly from the prediction, the hypothesis is considered disproved, unless it can be shown that the tested prediction was an incorrect deduction from the hypothesis, or that there are artifacts in the data or methodological flaws in their analysis that could account for the observed result. If the observed result does in fact accord with the prediction, the hypothesis survives, although it cannot be said to be proven. This is because it is logically impossible to prove the null hypothesis, which states that there is no difference between the predicted and the observed result. If there is an alternative hypothesis, it can also be tested against the same observed result.

For example, if we hypothesize that no tiger is living in the Sherwood Forest and a hundred people searching the forest fail to find a tiger, we have not proved the null hypothesis, because the searchers might have failed to look in the right places. If someone actually found a tiger in the forest, however, the hypothesis is absolutely disproved. The alternative hypothesis is that a tiger does live in the forest; finding a tiger clearly proves the hypothesis. The failure of searchers to find the tiger decreases the probability of its existence, and the more searching, the lower is the probability, but it can never prove the tiger's nonexistence.

Similarly, the default hypothesis predicts certain outcomes under specified conditions. If the observed outcome does not differ significantly from the predicted outcomes, the default hypothesis is upheld but not proved. If the prediction differs significantly from the observed result, the hypothesis must be rejected. Typically, it is modified to accord better with the existing evidence, and then its modified predictions are empirically tested with new data. If it survives numerous tests, it conventionally becomes a "fact." In this sense, for example, it is a "fact" that the earth revolves around the sun, and it is a "fact" that all present-day organisms have evolved from primitive forms.

Structural Equation Modeling. Probably the most rigorous methodology presently available to test the default hypothesis is the application of structural equation modeling to what is termed the biometric decomposition of a phenotypic mean difference into its genetic and environmental components. This methodology is an extraordinarily complex set of mathematical and statistical procedures, an adequate explanation of which is beyond the scope of this book, but for which detailed explanations are available. It is essentially a multiple regression technique that can be used to statistically test the differences in "goodness-of-fit" between alternative models, such as whether (1) a phenotypic mean difference between groups consists of a linear combination of the same genetic (G) and environmental (E) factors that contribute to individual differences within the groups, or (2) the group difference is attributable to some additional factor (an unknown Factor X) that contributes to variance between groups but not to variance within groups.

Biometric decomposition by this method requires quite modern and specialized computer programs (LISREL VII) and exacting conditions of the data to which it is applied -- above all, large and representative samples of the groups whose phenotypic means are to be decomposed into their genetic and environmental components. All subjects in each group must be measured with at least three or more different tests that are highly loaded on a common factor, such as g, and this factor must have high congruence between the two groups. Also, of course, each group must comprise at least two different degrees of kinship (e.g., MZ and DZ twins, or full-siblings and half-siblings) to permit reliable estimates of WGH for each of the tests. Further, in order to meet the assumption that WGH is the same in both groups, the estimates of WGH obtained for each of the tests should not differ significantly between the groups.

Given these stringent conditions, one can test whether the mean group difference in the general factor common to the various tests is consistent with the default model, which posits that the between-groups mean difference comprises the same genetic and environmental factors as do individual differences within each group. The goodness-of-fit of the data to the default model (i.e., group phenotypic difference = G + E) is then compared against the three alternative models, which posit only genetic (G) factors, or only environment (E), or neither G nor E, respectively, as the cause of the group difference. The method has been applied to estimate the genetic and environmental contributions to the observed sex difference in average blood pressure.

This methodology was applied to a data set that included scores on thirteen mental tests (average g loading = .67) given to samples of black and white adolescent MZ and DZ twins totaling 190 pairs. Age and a measure of socioeconomic status were regressed out of the test scores. The data showed by far the best fit to the default model, which therefore could not be rejected, while the fit of the data to the alternative models, by comparison with the default model, could be rejected at high levels of confidence ($p < .005$ to $p < .001$). That is, the observed W-B group difference is probably best explained in terms of both G and E factors, while either G or E alone is inadequate, given the assumption that G and E are the same within both groups. This result,

however, does not warrant as much confidence as the above p values would indicate, as these particular data are less than ideal for one of the conditions of the model. The data set shows rather large and unsystematic (though nonsignificant) differences in the WGHs of blacks and whites on the various tests. Therefore, the estimate of BGH, though similar to the overall WGH of the thirteen tests (about .60), is questionable. Even though the WGHs of the general factor do not differ significantly between the races, the difference is large enough to leave doubt as to whether it is merely due to sampling error or is in fact real but cannot be detected given the sample size. If the latter is true, then the model used in this particular method of analysis (termed the psychometric factor model) cannot rigorously be applied to these particular data.

A highly similar methodology (using a less restrictive model termed the biometric factor model) was applied to a much larger data set by behavioral geneticists David Rowe and co-workers. But Rowe's large-scale preliminary studies should first be described. He began by studying the correlations between objective tests of scholastic achievement (which are substantially loaded on g as well as on specific achievement factors) and assessment of the quality of the child's home environment based on environmental variables that previous research had established as correlates of IQ and scholastic achievement and which, overall, are intended to indicate the amount of intellectual stimulation afforded by the child's environment outside of school. Measures of the achievement and home environment variables were obtained on large samples of biologically full-sibling pairs, each tested twice (at ages 6.6 and 9.0 years). The total sample comprised three groups: white, black, and Hispanic, and represented the full range of socioeconomic levels in the United States, with intentional oversampling of blacks and Hispanics.

The data on each population group were treated separately, yielding three matrices (white, black, and Hispanic), each comprising the correlations between (1) the achievement and the environmental variables within and between age groups, (2) the full-sibling correlations on each variable at each age, and (3) the cross-sibling correlations on each variable at each age -- yielding twenty-eight correlation coefficients for each of the three ethnic groups.

Now if, in addition to the environmental factors measured in this study, there were some unidentified Factor X that is unique to a certain group and is responsible for most of the difference in achievement levels between the ethnic groups, one would expect that the existence of Factor X in one (or two), but not all three, of the groups should be detectable by an observed difference between groups in the matrix of correlations among all of the variables. That is, a Factor X hypothesized to represent a unique causal process responsible for lower achievement in one groups but not in the others should cause the pattern of correlations between environment and achievement, or between siblings, or between different ages, to be distinct for that group. However, since the correlation matrices were statistically equal, there was not the slightest evidence of a Factor X operating in any group. The correlation matrices of the different ethnic groups were as similar to one another as were correlation matrices derived from randomly selected half-samples within each ethnic group.

Further analyses by Rowe et al. that included other variables yielded the same results. Altogether the six data sets used in their studies included 8,582 whites, 3,392 blacks, 1,766 Hispanics, and 906 Asians. None of the analyses required a minority-unique developmental process or a cultural-environmental Factor X to explain the correlations between the achievement variables and the environmental variables in either of the minority groups. The results are consistent with the default hypothesis, as explained by Rowe et al: "Our explanation for the similarity of developmental processes is that (a) different racial and ethnic groups possess a common gene pool, which can create behavioral similarities, and that (b) among second-generation ethnic and racial groups in the United States, cultural differences are smaller than commonly believed because of the omnipresent force of our mass-media culture, from television to fast-food restaurants. Certainly, a burden of proof must shift to those scholars arguing a cultural difference position. They need to explain how matrices representing developmental processes can be so similar across ethnic and racial groups if major developmental processes exert a minority-specific influence on school achievement."

The dual hypothesis, which attributes the within-group variance to both genetic and environmental factors but excludes genetic factors from the mean differences between groups, would, in the light of these results, have to invoke a Factor X which, on the one hand, is so subtle and ghostly as to be perfectly undetectable in the whole matrix of correlations among test scores, environmental measures, full-siblings, and ages, yet sufficiently powerful to depress the minority group scores, on average, by as much as one-half a standard deviation.

To test the hypothesis that genetic as well as environmental factors are implicated in the group differences, Rowe and Cleveland designed a study that used the kind of structural equation modeling methodology (with the biometric factor model) mentioned previously. The study used full-siblings and half-siblings to estimate the WGH for large samples of blacks and whites (total $N = 1,220$) on three Peabody basic achievement tests (Reading Recognition, Reading Comprehension, and general Mathematics). A previous study had found that the heritability (WGH) of these tests averaged about .50 and their average correlation with verbal IQ = .65. The achievement tests were correlated among themselves about .75., indicating that they all share a large common factor, with minor specificities for each subtest.

The default hypothesis that the difference between the black and white group means on the single general achievement factor has the same genetic and non-genetic causes that contribute to individual differences within each group could not be rejected. The data fit the default model extremely well, with a goodness-of-fit index of .98 (which, like a correlation coefficient, is scaled from zero to one). The authors concluded that the genetic and environmental sources of individual differences and of differences between racial means appear to be identical. Compared to the white siblings, the black siblings had lower means on both the genetic and the environmental components. To demonstrate the sensitivity of their methodology, the authors substituted a fake mean value for the real mean for whites on the Reading Recognition test and did the same for blacks on the Math test. The fake white mean approximately equaled the true

black mean and vice versa. When the same analysis was applied to the data set with the fake means, it led to a clear-cut rejection of the default hypothesis. For the actual data set, however, the BGH did not differ significantly from the WGH. The values of the BGH were .66 to .74 for the verbal tests and .36 for the math test. On the side of caution, the authors state, "These estimates, of course, are imprecise because of sampling variation; they suggest that a part of the Black versus White mean difference is caused by racial genetic differences, but that it would take a larger study, especially one with more genetically informative half-sibling pairs, to make such estimates quantitatively precise".

Regression to the Population Mean. In the 1860s, Sir Francis Galton discovered a phenomenon that he first called reversion to the mean and later gave it the more grandiloquent title the law of filial regression to mediocrity. The phenomenon so described refers to the fact that, on every quantitative hereditary trait that Galton examined, from the size of peas to the size of persons, the measurement of the trait in the mature offspring of a given parent (or both parents) was, on average, closer to the population mean (for their own sex) than was that of the parent(s). An exceptionally tall father, for example, had Sons who are shorter than he; and an exceptionally short father had sons who were taller than he. (The same for mothers and daughters.)

This "regression to the mean" is probably better called regression toward the mean, the mean being that of the subpopulation from which the parent and offspring were selected. In quantitative terms, Galton's "law" predicts that the more that variation in a trait is determined by genetic factors, the closer the degree of regression (from one parent to one child), on average, approximates one-half. This is because an offspring receives exactly one-half of its genes from each parent, and therefore the parent-offspring genetic correlation equals .50. The corresponding phenotypic correlation, of course, is subject to environmental influences, which may cause the phenotypic sibling correlation to be greater than or (more usually) less than the genetic correlation of .50. The more that the trait is influenced by nongenetic factors, the greater is the departure of the parent-offspring correlation from .50. The average of the parent-child correlations for IQ reported in thirty-two studies is +.42. Traits in which variation is almost completely genetic, such as the number of fingerprint ridges, show a parent-offspring correlation very near .50. Mature height is also quite near this figure, but lower in childhood, because children attain their adult height at different rates. (Differences in both physical and mental growth curves are also largely genetic.)

Regression occurs for all degrees of kinship, its degree depending on the genetic correlation for the given kinship. Suppose we measure individuals (termed probands) selected at random from a given population and then measure their relatives (all of the same degree of kinship to the probands). Then, according to Galton's "law" and the extent to which the trait of interest is genetically determined, the expected value (i.e., best prediction) of the proband's relative (in standardized units, z) is $rGZP$. The expected difference between a proband and his or her relative will be equal to $rGZP$, where rG is the theoretical genetic correlation between relatives of a given degree of kinship, ZP is the standardized phenotypic measurement of the proband,

and ZR the predicted or expected measurement of the proband's relative. It should be emphasized that this prediction is statistical and therefore achieves a high degree of accuracy only when averaged over a large number of pairs of relatives. The standard deviation of the errors of prediction for individual cases is quite large.

A common misconception is that regression to the mean implies that the total variance in the population shrinks from one generation to the next, until eventually everyone in the population would be located at the mean on a given trait. In fact, the population variance does not change at all as a result of the phenomenon of regression. Regression toward the mean works in both directions. That is, offspring with phenotypes extremely above (or below) the mean have parents whose phenotypes are less extreme, but are, on average, above (or below) the population mean. Regression toward the mean is a statistical result of the imperfect correlation between relatives, whatever the causes of the imperfect correlation, of which there may be many.

Genetic theory establishes the genetic correlations between various kinships and thereby indicates how much of the regression for any given degree of kinship is attributable to genetic factors. Without the genetic prediction, any particular kinship regression (or correlation) is causally not interpretable. Resemblance between relatives could be attributed to any combination of genetic and nongenetic factors.

Empirical determination of whether regression to the mean accords with the expectation of genetic theory, therefore, provides another means of testing the default hypothesis. Since regression can result from environmental as well as from genetic factors (and always does to some extent, unless the trait variation has perfect heritability [i.e., $h^2 = 1$] and the phenotype is without measurement error), the usefulness of the regression phenomenon based on only one degree of kinship to test a causal hypothesis is problematic, regardless of its purely statistical significance. However, it would be remarkable (and improbable) if environmental factors consistently simulated the degree of regression predicted by genetic theory across a number of degrees of kinship.

A theory that completely excludes any involvement of genetic factors in producing an observed group difference offers no quantitative prediction as to the amount of regression for a given kinship and is unable to explain certain phenomena that are both predictable and explainable in terms of genetic regression. For example, consider Figure 11.2 (p. 358) in the previous chapter. It shows a phenomenon that has been observed in many studies and which many people not familiar with Galton's "law" find wholly surprising. One would expect, on purely environmental grounds, that the mean IQ difference between black and white children should decrease at each successively higher level of the parental socioeconomic status (i.e., education, occupational level, income, cultural advantages, and the like). It could hardly be argued that environmental advantages are not greater at higher levels of SES, in both the black and the white populations. Yet, as seen in Figure 11.2, the black and white group means actually diverge with increasing SES, although IQ increases with SES for both blacks and whites. The specific form of this

increasing divergence of the white and black groups is also of some theoretical interest: the black means show a significantly lower rate of increase in IQ as a function of SES than do the white means. These two related phenomena, black-white divergence and rate of increase in mean IQ as a function of SES, are predictable and explainable in terms of regression, and would occur even if there were no difference in IQ between the mean IQs of the black and the white parents within each level of SES. These results are expected on purely genetic grounds, although environmental factors also are most likely involved in the regression. For a given parental IQ, the offspring IQs (regardless of race) regress about halfway to their population mean. As noted previously, this is also true for height and other heritable physical traits.

Probably the single most useful kinship for testing the default hypothesis is full siblings reared together, because they are plentiful, they have developed in generally more similar environments than have parents and their own children, and they have a genetic correlation of about .50. I say "about .50" because there are two genetic factors that tend slightly to alter this correlation. As they work in opposite directions, their effects tend to cancel each other. When the total genetic variance includes nonadditive genetic effects (particularly genetic dominance) it slightly decreases the genetic correlation between full siblings, while assortative mating (i.e., correlation between the parents' genotypes) slightly increases the sibling correlation. Because of nongenetic factors, the phenotypic correlation between siblings is generally below the genetic correlation. Meta-analyses of virtually all of the full-sibling IQ correlations reported in the world literature yield an overall average r of only slightly below the predicted $+.50$.

Some years ago, an official from a large school system came to me with a problem concerning the school system's attempt to find more black children who would qualify for placement in classes for the "high potential" or "academically gifted" pupils (i.e., IQ of 120 or above). Black pupils were markedly underrepresented in these classes relative to whites and Asians attending the same schools. Having noticed that a fair number of the white and Asian children in these classes had a sibling who also qualified, the school system tested the siblings of the black pupils who had already been placed in the high-potential classes. However, exceedingly few of the black siblings in regular classes were especially outstanding students or had IQ scores that qualified them for the high-potential program. The official, who was concerned about bias in the testing program, asked if I had any other idea as to a possible explanation for their finding. His results are in fact fully explainable in terms of regression toward the mean.

I later analyzed the IQ scores on all of the full-sibling pairs in grades one through six who had taken the same IQ tests (Lorge-Thorndike) normed on a national sample in all of the fourteen elementary schools of another California school district. As this study has been described more fully elsewhere, I will only summarize here. There were over 900 white sibling pairs and over 500 black sibling pairs. The sibling intraclass correlations for whites and blacks were .40 and .38, respectively. The departure of these correlations from the genetically expected value of .50 indicates that nongenetic factors (i.e., environmental influences and unreliability of measurement) affect the sibling correlation similarly in both groups. In this school district,

blacks and whites who were perfectly matched for a true-score IQ of 120 had siblings whose average IQ was 113 for whites and 99 for blacks. In about 33 percent of the white sibling pairs both siblings had an IQ of 120 or above, as compared with only about 12 percent of black siblings.

Of more general significance, however, was the finding that Galton's "law" held true for both black and white sibling pairs over the full range of IQs (approximately IQ 50 to IQ 150) in this school district. In other words, the sibling regression lines for each group showed no significant deviation from linearity. (Including nonlinear transformations of the variables in the multiple regression equation produced no significant increment in the simple sibling correlation.) These regression findings can be regarded, not as a proof of the default hypothesis, but as wholly consistent with it. No purely environmental theory would have predicted such results. Of course, ex post facto and ad hoc explanations in strictly environmental terms are always possible if one postulates environmental influences on IQ that perfectly mimic the basic principles of genetics that apply to every quantitative physical characteristic observed in all sexually reproducing plants and animals.

A number of different mental tests besides IQ were also given to the pupils in the school district described above. They included sixteen age-normed measures of scholastic achievement in language and arithmetic skills, short-term memory, and a speeded paper-and-pencil psychomotor test that mainly reflects effort or motivation in the testing situation. Sibling intraclass correlations were obtained on each of the sixteen tests. IQ, being the most g loaded of all the tests, had the largest sibling correlation. All sixteen of the sibling correlations, however, fell below +.50 to varying degrees; the correlations ranged from .10 to .45., averaging .30 for whites and .28 for blacks. (For comparison, the average age-adjusted sibling correlations for height and weight in this sample were .44 and .38, respectively.) Deviations of these sibling correlations from the genetic correlation of .50 are an indication that the test score variances do reflect nongenetic factors to varying degrees. Conversely, the closer the obtained sibling correlation approaches the expected genetic correlation of .50, the larger its genetic component. These data, therefore, allow two predictions, which, if borne out, would be consistent with the default hypothesis: (1.) The varying magnitudes of the sibling correlations on the sixteen diverse tests in blacks and whites should be positively correlated. In fact, the correlation between the vector of sixteen black sibling correlations and the corresponding vector of sixteen white sibling correlations was $r = +.71$, $p = .002$. (2.) For both blacks and whites, there should be a positive correlation between (a) the magnitudes of the sibling correlations on the sixteen tests and (b) the magnitudes of the standardized mean W-B differences on the sixteen tests. The results show that the correlation between the standardized mean W-B differences on the sixteen tests and the siblings correlations is $r = +.61$, $p < .013$ for blacks, and $r = +.80$, $p < .001$ for whites.

Note that with regard to the second prediction, a purely environmental hypothesis of the mean W-B differences would predict a negative correlation between the magnitudes of the sibling correlations and the magnitudes of the mean W-B differences. The results in fact showing a

strong positive correlation contradict this purely nongenetic hypothesis.

CONTROLLING THE ENVIRONMENT: TRANSRACIAL ADOPTION

Theoretically, a transracial adoption study should provide a strong test of the default hypothesis. In reality, however, a real-life adoption study can hardly meet the ideal conditions necessary to make it definitive. Such conditions can be perfectly met only through the cross-fostering methods used in animal behavior genetics, in which probands can be randomly assigned to foster parents. Although adoption in infancy is probably the most comprehensive and powerful environmental intervention possible with humans, under natural conditions the adoption design is unavoidably problematic because the investigator cannot experimentally control the specific selective factors that affect transracial adoptions -- the adopted children themselves, their biological parents, or the adopting parents. Prenatal and perinatal conditions and the preadoption environment are largely uncontrolled. So, too, is the willingness of parents to volunteer their adopted children for such a study, which introduces an ambiguous selection factor into the subject sampling of any adoption study. It is known that individuals who volunteer as subjects in studies that involve the measurement of mental ability generally tend to be somewhat above-average in ability. For these reasons, and given the scarcity of transracial adoptions, few such studies have been reported in the literature. Only one of these, known as the Minnesota Transracial Adoption Study, is based on large enough samples of black and white adoptees to permit statistical analysis. While even the Minnesota Study does not meet the theoretically ideal conditions, it is nevertheless informative with respect to the default hypothesis.

Initiated and conducted by Sandra Scarr and several colleagues, the Minnesota Transracial Adoption Study examined the same groups of children when they were about age 7 and again in a 10-year follow-up when they were about age 17. The follow-up study is especially important, because it has been found in other studies that family environmental influences on IQ decrease from early childhood to late adolescence, while there is a corresponding increase in the phenotypic expression of the genetic component of IQ variance. Therefore, one would have more confidence in the follow-up data (obtained at age 17) as a test of the default hypothesis than in the data obtained at age 7.

Four main groups were compared on IQ and scholastic performance:

1. Biological offspring of the white adoptive parents.
2. Adopted children whose biological father and mother were both white (WW).
3. Adopted interracial children whose biological fathers were black and whose mothers were white (BW).
4. Adopted children whose biological father and mother were both black (BB).

The adoptive parents were all upper-middle class, employed in professional and managerial occupations, with an average educational level of about sixteen years (college graduate) and an average WAIS IQ of about 120. The biological parents of the BB and BW adoptees averaged 11.5 years and 12.5 years of education, respectively. The IQs of the adoptees' biological parents were not known. Few of the adoptees ever lived with their biological parents; some lived briefly in foster homes before they were legally adopted. The average age of adoption was 32 months for the BB adoptees, 9 months for the BW adoptees, and 19 months for the WW adoptees. The adoptees came mostly from the North Central and North Eastern regions of the United States. The Stanford-Binet and the Wechsler Intelligence Scale for Children (WTSC) were used in the first study (at age seven), the Wechsler Adult Intelligence Scale (WAIS) was used in the follow-up study (at age seventeen).

The investigators hypothesized that the typical W-B IQ difference results from the lesser relevance of the specific information content of IQ tests to the blacks' typical cultural environment. They therefore suggest that if black children were reared in a middle or upper-middle class white environment they would perform near the white average on IQ tests and in scholastic achievement. This cultural-difference hypothesis therefore posits no genetic effect on the mean W-B IQ difference; rather, it assumes equal black and white means in genotypic g . The default hypothesis, on the other hand, posits both genetic and environmental factors as determinants of the mean W-B IQ difference. It therefore predicts that groups of black and white children reared in highly similar environments typical of the white middle-class culture would still differ in IQ to the extent expected from the heritability of IQ within either population.

The data of the Minnesota Study also allow another prediction based on the default hypothesis, namely, that the interracial children (BW) should score, on average, nearly (but not necessarily exactly) halfway between the means of the WW and BB groups. Because the alleles that enhance IQ are genetically dominant, we would expect the BW group mean to be slightly closer to the mean of the WW group than to the mean of the BB group. That is, the heterosis (outbreeding enhancement of the trait) due to dominance deviation would raise the BW group's mean slightly above the midpoint between the BB and WW groups. (This halfway point would be the expected value if the heritability of IQ reflected only the effects of additive genetic variance.) Testing this predicted heterotic effect is unfortunately debased by the fact that the IQs of the biological parents of the BB and BW groups were not known. As the BB biological parents had about one year less education than the BW parents, given the correlation between IQ and education, it is likely that the mean IQ of the BB parents was somewhat lower than the mean IQ of the BW parents, and so would produce a result similar to that predicted in terms of heterosis. It is also possible, though less likely, that the later age of adoption (by twenty-one months) of the BB adoptees than of the BW adoptees would produce an effect similar to that predicted in terms of heterosis.

The results based on the subjects who were tested on both occasions are shown in Table 12.5.

Because different tests based on different standardization groups were used in the first testing than were used in the follow-up testing, the overall average difference of about eight IQ points (evident for all groups) between the two test periods is of no theoretical importance for the hypothesis of interest. The only important comparisons are those between the WW, BW, and BB adopted groups within each age level. They show that:

* The biological offspring have about the same average IQ as has been reported for children of upper-middle-class parents. Their IQs are lower, on average, than the average IQ of their parents, consistent with the expected genetic regression toward the population mean (mainly because of genetic dominance, which is known to affect IQ-see Chapter. 7, pp. 189-91). The above-average environment of these adoptive families probably counteracts the predicted genetic regression effect to some extent, expectably more at age seven than at age seventeen.

* The BB adoptees' mean IQ is close to the mean IQ of ninety for blacks in the same North Central area (from, which the BB adoptees came) reared by their own parents. At age seventeen the BB group's IQ is virtually identical to the mean IQ of blacks in the North Central part of the United States. Having been reared from two years of age in a white upper-middle-class environment has apparently had little or no effect on their expected IQ, that is, the average IQ of black children reared in the average black environment. This finding specifically contradicts the expectation of the cultural-difference explanation of the W-B IQ difference, but is consistent with the default hypothesis.

* The BB group is more typical of the U.S. black population than is the BW group. The BB group's IQ at age seventeen is sixteen points below that of the white adoptees and thirteen points below the mean IQ of whites in the national standardization sample of the WAIS. Thus the BB adoptees' IQ is not very different from what would be expected if they were reared in the average environment of blacks in general (i.e., IQ eighty-five).

* The mean IQ of the interracial adoptees (BW), both at ages seven and seventeen, is nearly intermediate between the WW and BB adoptees, but falls slightly closer to the WW mean. This is consistent with, but does not prove, the predicted heterotic effect of outbreeding on IQ. The intermediate IQ at age seven is $(WW + BB)/2 = (117.6 + 95.4)/2 = 106.5$, or three points below the observed IQ of the BW group; at age seventeen the intermediate IQ is 97.5, or one point below the observed IQ of the BW group. Of course, mean deviations of this magnitude, given the sample sizes in this study, are not significant. Hence no conclusion can be drawn from these data regarding the predicted heterotic effect. But all of the group IQ means do differ significantly from one another, both at age seven and at age seventeen, and the fact that the BW adoptees are so nearly intermediate between the WW and BR groups is hard to explain in purely environmental or cultural terms. But it is fully consistent with the genetic prediction. An ad hoc explanation would have to argue for the existence of some cultural effects that quantitatively simulate the prediction of the default hypothesis, which is derived by simple arithmetic from accepted genetic theory.

* Results similar to those for IQ were also found for scholastic achievement measured at age seventeen, except that the groups differed slightly less on the scholastic achievement measures than on IQ. This is probably because the level of scholastic achievement is generally more susceptible to family influences than is the IQ. The mean scores based on the average of five measures of scholastic achievement and aptitude expressed on the same scale as the IQ were: Nonadopted biological offspring = 107.2, WW adoptees = 103.1, BW adoptees = 100.1, BB adoptees = 95.1. Again, the BW group's mean is but one point above the midpoint between the means of the WW and BB groups.

In light of what has been learned from many other adoption studies, the results of this transracial adoption study are hardly surprising. As was noted in Chapter 7 (pp. 177-79), adoption studies have shown that the between-family (or shared) environment is the smallest component of true-score IQ variance by late adolescence.

It is instructive to consider another adoption study by Scarr and Weinberg, based on nearly 200 white children who, in their first year of life, were adopted into 104 white families. Although the adoptive families ranged rather widely in socioeconomic status, by the time the adoptees were adolescents there were nonsignificant and near-zero correlations between the adoptee's IQs and the characteristics of their adoptive families, such as the parents' education, IQ, occupation, and income. Scarr and Weinberg concluded that, within the range of "humane environments," variations in family socioeconomic characteristics and in child-rearing practices have little or no effect on IQ measured in adolescence. Most "humane environments," they claimed, are functionally equivalent for the child's mental development.

In the transracial adoption study, therefore, one would not expect that the large differences between the mean IQs of the WW, BW, and BB adoptees would have been mainly caused by differences in the unquestionably humane and well-above-average adoptive family environments in which these children grew up. Viewed in the context of adoption studies in which race is not a factor, the group differences observed in the transracial adoption study would be attributed to genetic factors.

There is simply no good evidence that social environmental factors have a large effect on IQ, particularly in adolescence and beyond, except in cases of extreme environmental deprivation. In the Texas Adoption Study, for example, adoptees whose biological mothers had IQs of ninety-five or below were compared with adoptees whose biological mothers had IQs of 120 or above. Although these children were given up by their mothers in infancy and all were adopted into good homes, the two groups differed by 15.7 IQ points at age 7 years and by 19 IQ points at age 17. These mean differences, which are about one-half of the mean difference between the low-IQ and high-IQ biological mothers of these children, are close to what one would predict from a simple genetic model according to which the standardized regression of offspring on biological parents is .50.

In still another study, Turkheimer used a quite clever adoption design in which each of the adoptee probands was compared against two nonadopted children, one who was reared in the same social class as the adopted proband's biological mother, the other who was reared in the same social class as the proband's adoptive mother. (In all cases, the proband's biological mother was of lower SES than the adoptive mother.) This design would answer the question of whether a child born to a mother of lower SES background and adopted into a family of higher SES background would have an IQ that is closer to children who were born and reared in a lower SES background than to children born and reared in a higher SES background. The result: the proband adoptees' mean IQ was nearly the same as the mean IQ of the nonadopted children of mothers of lower SES background but differed significantly (by more than 7.5 IQ points) from the mean IQ of the nonadopted children of mothers of higher SES background. In other words, the adopted probands, although reared by adoptive mothers of higher SES than that of the probands' biological mothers, turned out about the same with respect to IQ as if they had been reared by their biological mothers, who were of lower SES. Again, it appears that the family social environment has a surprisingly weak influence on IQ. This broad factor therefore would seem to carry little explanatory weight for the IQ differences between the WW, BW, and BB groups in the transracial adoption study.

There is no evidence that the effect of adoption is to lower a child's IQ from what it would have been if the child were reared by its own parents, and some evidence indicates the contrary. Nor is there evidence that transracial adoption per se is disadvantageous for cognitive development. Three independent studies of Asian children (from Cambodia, Korea, Thailand, and Vietnam) adopted into white families in the United States and Belgium have found that, by school age, their IQ (and scholastic achievement), on average, considerably exceeds that of middle-class white American and Belgian children by at least ten IQ points, despite the fact that many of the Asian children had been diagnosed as suffering from malnutrition prior to adoption.

The authors of the Minnesota Study suggest the difference in age of adoption of the BB and BW groups (32 months and 9 months, respectively) as a possible cause of the lower IQ of the BB group (by 12 points at age 7, 9 points at age 17). The children were in foster care prior to adoption, but there is no indication that the foster homes did not provide a humane environment. A large-scale study specifically addressed to the effect of early versus late age of adoption on children's later IQ did find that infants who were adopted before one year of age had significantly higher IQs at age four years than did children adopted after one year of age, but this difference disappeared when the children were retested at school age. The adoptees were compared with nonadopted controls matched on a number of biological, maternal, prenatal, and perinatal variables as well as on SES, education, and race. The authors concluded, "The adopted children studied in this project not only did not have higher IQ than the [matched] controls, but also did not perform at the same intellectual level as the biologic children from the same high socioeconomic environment into which they were adopted. . . . the better socioeconomic environment provided by adoptive parents is favorable for an adopted child's physical growth (height and weight) and academic achievement but has no influence on the child's head

measurement and intellectual capacity, both of which require a genetic influence."

In the Minnesota Transracial Adoption Study, multiple regression analyses were performed to compare the effects of ten environmental variables with the effects of two genetic variables in accounting for the IQ variance at age seventeen in the combined black and interracial groups (i.e., BB & BW). The ten environmental variables were those associated with the conditions of adoption and the adoptive family characteristics (e.g., age of placement, time in adoptive home, number of preadoptive placements, quality of preadoptive placements, adoptive mother's and father's education, IQ, occupation, and family income). The two genetic variables were the biological mother's race and education. (The biological father's education, although it was known, was not used in the regression analysis; if it were included, the results might lend slightly more weight to the genetic variance accounted for by this analysis.) The unbiased multiple correlation (R) between the ten environmental variables and IQ was .28. The unbiased R between the two genetic variables and IQ was .39. This is a fairly impressive correlation, considering that mother's race was treated, as a dichotomous variable with a 72%(BW mothers)/28%(BB mothers) split. (The greater the departure from the optimal 50%/50% split, the more restricted is the size of the obtained correlation. If the obtained correlation of .39 were corrected to compensate for this suboptimal split, the corrected value would be .43.) Moreover, mother's education (measured in years) is a rather weak surrogate for IQ; it is correlated about +.7 with IQ in the general population. (In the present sample, the biological mothers' years of education in the BB group had a mean of 10.9, SD = 1.9 years, range 6-14 years; the BW group had a mean of 12.4, SD = 1.8, range 7-18.)

The two critiques, by Levin and by Lynn, of the authors' social-environmental interpretation of the results of their follow-up study are well worth reading, as is the authors' detailed reply, in which they state, "We think that it is exceedingly implausible that these differences are either entirely genetically based or entirely environmentally based."

STUDIES BASED ON RACIAL ADMIXTURE

In the Minnesota Transracial Adoption Study, the interracial adoptees labeled BW (black father, white mother) had a mean IQ approximately intermediate between those of the white (WW) and the black (BB) adoptees. One might expect, therefore, that individual variation in IQ among the population of black Americans would be correlated with individual variation in the percentage of Caucasian admixture. (The mean percentage of European genes in American blacks today is approximately 25 percent, with an undetermined standard deviation for individual variation.) This prediction could be used to test the hypothesis that blacks and whites differ in the frequencies of the alleles whose phenotypic effects are positively correlated with g. The several attempts to do so, unfortunately, are riddled with technical difficulties and so are unable to reduce the uncertainty as to the nature of the mean W-B difference in IQ.

An ideal study would require that the relative proportions of European and African genes in

each hybrid individual be known precisely. This, in turn, would demand genealogical records extending back to each individual's earliest ancestors of unmixed European and African origin. In addition, for the results to be generalizable to the present-day populations of interest, one would also need to know how representative of the white and black populations in each generation of interracial ancestors of the study probands (i.e., the present hybrid individuals whose level of g is measured) were. A high degree of assortative mating for g , for example, would mean that these ancestors were not representative and that cross-racial matings transmitted much the same g -related alleles from each racial line. Also, the results would be ambiguous if there were a marked systematic difference in the g levels of the black and white mates (e.g., in half of the matings the black [or hybrid] $g >$ white g and vice versa in the other half). This situation would act to cancel any racial effect in the offspring's level of g .

A large data set that met these ideal conditions would provide a strong test of the genetic hypothesis. Unfortunately, such ideal data do not exist, and are probably impossible to obtain. Investigators have therefore resorted to estimating the degree of European admixture in representative samples of American blacks 'by means of blood-group analyses, using those blood groups that differ most in frequency between contemporary Europeans and Africans in the regions of origin of the probands' ancestors. Each marker blood group is identified with a particular polymorphic gene. Certain antigens or immunoglobulins in the blood serum, which have different polymorphic gene loci, are also used in the same way. The gene loci for all of the known human blood loci constitute but a very small fraction of the total number of genes in the human genome. To date, only two such loci, the Fy (Duffy) blood group and the immunoglobulin Gm, have been identified that discriminate very markedly between Europeans and Africans, with near-zero frequencies in one population and relatively high frequencies in the other. A number of other blood groups and blood serum antigens also discriminate between Europeans and Africans, but with much less precision. T. E. Reed, an expert on the genetics of blood groups, has calculated that a minimum of eighteen gene loci with perfect discrimination power (i.e., 100 percent frequency in one population and 0 percent in the other) are needed to determine the proportions of European/African admixture with a 5 percent or less error rate for specific individuals. This condition is literally impossible to achieve given the small number of blood groups and serum antigens known to differ in racial frequencies. However, blood group data, particularly that of Fy and Gm, aggregated in reasonably large samples are capable of showing statistically significant mean differences in mental test scores between groups if in fact the mean difference has a genetic component.

A critical problem with this methodology is that we know next to nothing about the level of g in either the specific European or African ancestors or of the g -related selective factors that may have influenced mating patterns over the many subsequent generations of the hybrid offspring, from the time of the first African arrivals in America up to the present. Therefore, even if most of the European blood-group genes in present-day American blacks had been randomly sampled from European ancestors, the genes associated with g may not have been as randomly sampled, if systematic selective mating took place between the original ancestral groups or in the many

generations of hybrid descendants.

Another problem with the estimation of racial admixture from blood-group frequencies is that most of the European genes in the American black gene pool were introduced generations ago, mostly during the period of slavery. According to genetic principles, the alleles of a particular racial origin would become increasingly disassociated from one another in each subsequent generation. The genetic result of this disassociation, which is due to the phenomena known as crossing-over and independent segregation of alleles, is that any allele that shows different frequencies in the ancestral racial groups becomes increasingly less predictive of other such alleles in each subsequent generation of the racially hybridized population. If a given blood group of European origin is not reliably correlated with other blood groups of European origin in a representative sample of hybrid individuals, we could hardly expect it to be correlated with the alleles of European origin that affect *g*. In psychometric terms, such a blood group would be said to have little or no validity for ranking hybrid individuals according to their degree of genetic admixture, and would therefore be useless in testing the hypothesis that variation in *g* in a hybrid (black-white) population is positively correlated with variation in amount of European admixture.

This disassociation among various European genes in black Americans was demonstrated in a study based on large samples of blacks and whites in Georgia and Kentucky. The average correlations among the seven blood-group alleles that differed most in racial frequencies (out of sixteen blood groups tested) were not significantly different from zero, averaging $-.015$ in the white samples (for which the theoretically expected correlation is zero) and $-.030$ in the black samples. (Although the correlations between blood groups in individuals were nil, the total frequencies of each of the various blood groups were quite consistent [$r=.88$] across the Georgia and Kentucky samples.) *Gm* was not included in this correlation analysis but is known to be correlated with *Fy*. These results, then, imply that virtually all blood groups other than *Fy* and *Gm* are practically useless for estimating the proportions of Caucasian admixture in hybrid black individuals. It is little wonder, then, that, in this study, the blood-group data from the hybrid black sample yielded no evidence of being significantly or consistently correlated with *g* (which was measured as the composite score on nineteen tests).

A similar study, but much more complex in design and analyses, by Sandra Scarr and co-workers, ranked 181 black individuals (in Philadelphia) on a continuous variable, called an "odds" index, estimated from twelve genetic markers that indicated the degree to which an individual's genetic markers resembled those of Africans without any Caucasian ancestry versus the genetic markers of Europeans (without any African ancestry). This is probably an even less accurate estimate of ancestral admixture than would be a direct measure of the percentage of African admixture, which (for reasons not adequately explained by the authors) was not used in this study, although it was used successfully in another study of the genetic basis of the average white-black difference in diastolic blood pressure. The "odds" index of African ancestry showed no significant correlation with individual IQs. It also failed to discriminate significantly between

the means of the top and bottom one-third of the total distribution on the "ancestral odds" index of Caucasian ancestry. In brief, the null hypothesis (i.e., no relationship between hybrid mental test score and amount of European ancestry) could not be rejected by the data of this study. The first principal component of four cognitive tests yielded a correlation of only -.05 with the ancestral index. Among these tests, the best measure of fluid g, Raven matrices, had the largest correlation (-.13) with the estimated degree of African ancestry. (In this study, a correlation of -.14 would be significant at $p < .05$, one-tailed.) But even the correlation between the ancestral odds index based on the three best genetic markers and the ancestral odds index based on the remaining nine genetic markers was a nonsignificant +.10. A measure of skin color (which has a much greater heritability than mental test scores) correlated .27 ($p < .01$) with the index of African ancestry. When skin color and SES were partialled out of the correlation between ancestry and test scores, all the correlations were reduced (e.g., the Raven correlation dropped from .13 to .10). Since both skin color and SES have genetic components that are correlated with the ancestral index and with test scores, partialing out these variables further favors the null hypothesis by removing some of the hypothesized genetic correlation between racial admixture and test scores.

It is likely that the conclusions of this study constitute what statisticians refer to as Type II error, acceptance of the null hypothesis when it is in fact false. Although these data cannot reject the null hypothesis, it is questionable whether they are capable in fact of rejecting an alternative hypothesis derived from the default theory. The specific features of this data set severely diminish its power to reject the null hypothesis. In a rather complex analysis, I have argued that the limitations of this study (largely the lack of power due to the low validity of the ancestral index when used with an insufficient sample size) would make it incapable of rejecting not only the null hypothesis, but also any reasonable alternative hypothesis. This study therefore cannot reduce the heredity-environment uncertainty regarding the W-B difference in psychometric g. In another instance of Type II error, the study even upholds the null hypothesis regarding the nonexistence of correlations that are in fact well established by large-scale studies. It concludes, for example, that there is no significant correlation between lightness of skin color and SES of American blacks, despite the fact that correlations significant beyond the .01 level are reported in the literature, both for individuals' SES of origin and for attained SES.

Skin Color and IQ. Earlier researchers relied on objective measures of skin color as an index of the amount of African/European admixture. In sixteen out of the eighteen studies of the IQ of American blacks in which skin color was measured, the correlations between lightness of skin color and test scores were positive (ranging from +.12 to +.30).

Although these positive correlations theoretically might well reflect the proportion of Caucasian genes affecting IQ in the hybrid blacks, they are weak evidence, because skin color is confounded with social attitudes that may influence IQ or its educational and occupational correlates. It is more likely that the correlations are the result of cross-assortative mating for skin color and IQ, which would cause these variables to be correlated in the black population. (There

is no doubt that assortative mating for skin color has taken place in the black population.) The same is of course true for the other visible racial characteristics that may be correlated with IQ. If, in the black population, lighter skin color (or a generally more Caucasoid appearance) and higher IQ (or its correlates: education, occupation, SES) are both considered desirable in a mate, they will be subject to assortative mating and to cross-assortative mating for the two characteristics, and the offspring would therefore tend to possess both characteristics. But any IQ-enhancing genes are as likely to have come from the African as from the European ancestors of the hybrid descendants.

In general, skin color and the other visible physical aspects of racial differences are unpromising variables for research aimed at reducing the heredity-environment uncertainty of the causal basis of the average W-B difference in g .

Black-White Hybrids in Post-World War II Germany. We saw in the Minnesota Transracial Adoption Study that the interracial (BW) adoptees, whose biological fathers were black and whose biological mothers were white, averaged lower in IQ than the adoptees who had two white parents (WW). This finding appears to be at odds with the study conducted by Eyferth in Germany following World War II, which found no difference between offspring of BW and WW matings who were reared by their biological mothers. All of the fathers (black or white) were members of the U.S. occupation forces stationed in Germany. The mothers were unmarried German women, mostly of low SES. There were about ninety-eight interracial (BW) children and about eighty-three white children (WW). The mothers of the BW and WW children were approximately matched for SES. The children averaged about 10 years of age, ranging between ages 5 and 13 years. They all were tested with the German version of the Wechsler Intelligence Scale for Children (WISC). The results are shown in Table 12.6. The overall WW-BW difference is only one IQ point. As there is no basis for expecting a difference between boys and girls (whose average IQs are equal in the WISC standardization sample), the eight-point difference between the WW boys and WW girls in this study is most likely due to sampling error. But sampling error does not only result in sample differences that are larger than the corresponding population difference; it can also result in sample differences that are smaller than the population difference, and this could be the case for the overall mean WW-BW difference.

This study, although consistent with a purely environmental hypothesis of the racial difference in test scores, is not conclusive, however, because the IQs of the probands' mothers and fathers' were unknown and the white and black fathers were not equally representative of their respective populations, since about 30 percent of blacks, as compared with about 3 percent of whites, failed the preinduction mental test and were not admitted into the armed services. Further, nothing was known about the Army rank of the black or white fathers of the illegitimate offspring; they could have been more similar in IQ than the average black or white in the occupation forces because of selective preferences on the part of the German women with whom they had sexual relations. Then, too, nearly all of the children were tested before adolescence,

which is before the genotypic aspect of IQ has become fully manifested. Generally in adoption studies, the correlation of IQ and genotype increases between childhood and late adolescence, while the correlation between IQ and environment decreases markedly. Finally, heterosis (the outbreeding effect; see Chapter 7, p. 196) probably enhanced the IQ level of the interracial children, thereby diminishing the IQ difference between the interracial children and the white children born to German women. A heterotic effect equivalent to about +4 IQ points was reported for European-Asian interracial offspring in Hawaii.

Genetic Implications of IQ and Fertility for Black and White Women.

Fertility is defined as the number of living children a woman (married or unmarried) gives birth to during her lifetime. If, in a breeding population, IQ (and therefore g) is consistently correlated with fertility, it will have a compounded effect on the trend of the population's mean IQ in each generation -- an increasing trend if the correlation is positive, a decreasing trend if it is negative (referred to as positive or negative selection for the trait). This consequence naturally follows from the fact that mothers' and children's IQs are correlated, certainly genetically and usually environmentally.

If IQ were more negatively correlated with fertility in one population than in another (for example, the American black and white populations), over two or more generations the difference between the two populations' mean IQs would be expected to diverge increasingly in each successive generation. Since some part of the total IQ variance within each population is partly genetic (i.e., the heritability), the intergenerational divergence in population means would also have to be partly genetic. It could not be otherwise, unless one assumed that the mother-child correlation for IQ is entirely environmental (an assumption that has been conclusively ruled out by adoption studies). Therefore, in each successive generation, as long as there is a fairly consistent difference in the correlation between IQ and fertility for the black and white populations, some part of the increasing mean group difference in IQ is necessarily genetic. If fertility is negatively correlated with a desirable trait that has a genetic component, IQ for example, the trend is called dysgenic; if positively correlated, eugenic.

The phenomenon of regression toward the population mean (see Chapter 12, pp. 467-72) does not mitigate a dysgenic trend. Regression to the mean does not predict that a population's genotypic mean in one generation regresses toward the genotypic mean of the preceding generation. In large populations, changes in the genotypic mean of a given trait from one generation to the next can come about only through positive (or negative) selection for that trait, that is, by changes in the proportion's of the breeding population that fall into different intervals of the total distribution of the trait in question.

It is also possible that a downward genetic trend can be phenotypically masked by a simultaneous upward trend in certain environmental factors that favorably affect IQ, such as advances in prenatal care, obstetrical practices, nutrition, decrease in childhood diseases, and

education. But as the positive effect of these environmental factors approaches asymptote, the downward dysgenic trend will continue, and the phenotypic (IQ) difference between the populations will begin to increase.

Is there any evidence for such a trend in the American black and white populations? There is, at least presently and during the last half of this century, since U.S. Census data relevant to this question have been available. A detailed study based on data from the U.S. Census Bureau and affiliated agencies was conducted by Daniel Vining, a demographer at the University of Pennsylvania. His analyses indicate that, if IQ is, to some degree heritable (which it is), then throughout most of this century (and particularly since about 1950) there has been an overall downward trend in the genotypic IQ of both the white and the black populations. The trend has been more unfavorable for the black population.

But how could the evidence for a downward trend in the genotypic component of IQ be true, when other studies have shown a gradual rise in phenotypic IQ over the past few decades? (This intergenerational rise in IQ, known as the "Flynn effect," is described in Chapter 10, pp. 318-22). Since the evidence for both of these effects is solid, the only plausible explanation is that the rapid improvement in environmental conditions during this century has offset and even exceeded the dysgenic trend. However, this implies that the effect of the dysgenic trend should become increasingly evident at the phenotypic level as improvements in the environmental factors that enhance mental development approach their effective asymptote for the whole population.

Table 12.7 shows the fertility (F) of white and black women within each one standard deviation interval of the total distribution of IQ in each population. (The average fertility estimates include women who have had children and women who have not had any children by age thirty-four.) Assuming a normal distribution (which is closely approximated for IQ within the range of $\pm 2s$), the table also shows: (a) the estimated proportion (P) of the population within each interval, (b) the product of $F \times P$, and (c) the mean IQ of the women within each interval. The average fertility in each of the IQ intervals and the average IQs in those intervals are negatively correlated (-.86 for whites, -.96 for blacks), indicating a dysgenic trend in both populations, though stronger in the black population.

Now, as a way of understanding the importance of Table 12.7, let us suppose that the mean IQ for whites was 100 and the mean IQ for blacks was 85 in the generation preceding that of the present sample of women represented in Table 12.7. Further, suppose that in that preceding generation the level of fertility was the same within each IQ interval. Then their offspring (that is, the present generation) would have an overall mean IQ equal to the weighted mean of the average IQ within each IQ interval (the weights being the proportion, P, of the population falling within each IQ interval). These means would also be 100 and eighty-five for the white and black populations, respectively.

But now suppose that in the present generation there is negative selection for IQ, with the fertility of the women in each IQ interval exactly as shown in Table 12.7. (This represents the actual condition in 1978 as best as we can determine.)

What then will be the overall mean IQ of the subsequent generation of offspring? The weights that must be used in the calculation are the products of the average fertility (F) in each interval and the proportion (P) of women in each interval (i.e., the of values $F \times P$, shown in Table 12.7). The predicted overall weighted mean IQ, then, turns out to be 98.2 for whites and 82.6 for blacks, a drop of 1.8 IQ points and of 2.4 IQ points, respectively. The effect thus increases the W-B IQ difference from 15 IQ points in the parent generation to 15.6 IQ points in the offspring generation -- an increase in the W-B difference of 0.6 IQ points in a single generation. Provided that IQ has substantial heritability within each population, this difference must be partly genetic. So if blacks have had a greater relative increase in environmental advantages that enhance IQ across the generations than whites have had, the decline of the genetic component of the black mean would be greater than the decline of the white genetic mean, because of environmental masking, as previously explained. We do not know just how many generations this differential dysgenic trend has been in effect, but extrapolated over three or four generations it would have worsening consequences for the comparative proportions in each population that fall above or below 100 IQ. (Of course, fertility rates could change in the positive direction, but so far there is no evidence of this.) In the offspring generation of the population samples of women shown in Table 12.7, the percentage of each population above/below IQ 100 would be: whites 43.6%/56.4%, blacks 12.4%/87.6% (assuming no increase in environmental masking between the generations). The W/B ratio above 100 IQ is about $43.6\%/12.4\% = 3.5$; the B/W ratio below 100 IQ is $.87.6\%/56.4\% = 1.55$. These ratios or any approximations of them would have considerable consequences if, for example, an IQ of 100 is a critical cutoff score for the better-paid types of employment in an increasingly technological and information-intensive economy (see Chapter 14). Because generation time (measured as mother's age at the birth of her first child) is about two years less in blacks than in whites, the dysgenic trend would compound faster over time in the black population than in the white. Therefore, the figures given above probably underestimate any genetic component of the W-B IQ difference attributable to differential fertility.

This prediction follows from recent statistics on fertility rates. A direct test of this effect would require a comparison of the average IQ of women in one generation with the average IQ of all of their children who constitute the next generation. Such cross-generational IQ data are available from the National Longitudinal Study of Youth (NLSY). Large numbers of youths, including whites and blacks, originally selected as part of a nationally representative sample of the U.S. population, were followed to maturity. The mean IQ of the women in this group was compared with the mean IQ of their school-age children. Whereas the mean IQ difference between the white and black mothers in the study was 13.2 IQ points, the difference between the white and black children was 17.5 IQ points. That is, the overall mean W-B IQ difference in this sample had increased by about four IQ points in one generation. As there is no indication that the

children had been reared in less advantaged environments than their mothers, this effect is most reasonably attributable to the negative correlation between the mothers' IQs and their fertility, which is more marked in the NLSY sample than in the Census sample represented in Table 12.7. But I have not found any bona fide data set that disconfirms either the existence of a dysgenic trend for IQ of the population as a whole or the widening disparity in the mean W-B IQ difference.

Racial Differences in Neonate Behavior. Although individual differences in infant psychomotor behavior (i.e., reactivity to sensory stimulation, muscular strength, and coordination) have very little, if any, correlation with mental ability measured from about age three years and up (and therefore are not directly relevant to individual or group differences in *g*), black and white infants, both in Africa and in America, differ markedly in psychomotor behavior even within the first few days and weeks after birth. Black neonates are more precocious in psychomotor development, on average, than whites, who are more precocious in this respect than Asians. This is true even when the black, white, and Asian babies were born in the same hospital to mothers of similar SES background who gave birth under the same obstetrical conditions. Early precocity in motor behavior among blacks also appears to be positively related to degree of African ancestry and is negatively related to their SES. African blacks are more precocious than American blacks, and, at least in the United States, black infants of lower SES are more precocious in motor development than blacks of middle and upper-middle SES. (The same SES relationship is also observed in whites.) These behavioral differences appear so early (e.g., one or two days after delivery, when the neonates are still in hospital and have had little contact with the mothers) that purely cultural or environmental explanations seem unlikely. Substantiated in at least three dozen studies, these findings constitute strong evidence for innate behavioral differences between groups.

Relationship of Myopia to IQ and Race. In Chapter 6 it was noted that myopia (nearsightedness) is positively correlated with IQ and that the relationship appears to be pleiotropic, that is, a gene affecting one of the traits also has some effect on the other trait. Further, there are significant racial and ethnic differences in the frequency of myopia. Among the major racial groups measured, the highest rates of myopia are found in Asians (particularly Chinese and Japanese); the lowest rates among Africans; and Europeans are intermediate. Among Europeans, Jews have the highest rate of myopia, about twice that of gentiles and about on a par with that of the Asians. The same rank ordering of all these groups is found for the central tendency of scores on highly *g*-loaded tests, even when these groups have had comparable exposure to education. Cultural and environmental factors, except as they may have had an evolutionary impact in the distant past, cannot adequately explain the differences found among contemporary populations. Among populations of the same ethnic background, no relationship has been found between myopia and literacy. Comparisons of groups of the same ethnicity who learned to read before age twelve with those who learned after age twelve showed no difference in rates of myopia.

Table 12.8 shows the results of preinduction examinations of random samples of 1,000 black

and 11,000 white draftees for the U.S. Armed Services who were diagnosed as (a) mildly myopic and accepted for service, and (b) too severely myopic to be accepted. As myopia (measured in diopters) is approximately normally distributed in the population, the percentages of whites and blacks diagnosed as myopic can also be expressed in terms of their deviations from the population mean in standard deviation (s) units. These average deviations are shown on the right side of Table 12.8. They indicate the approximate cutoff points (in s units) for the diagnosis of mild and of severe myopia in the total frequency distribution of refractive error (extending from extreme hyperopia, or farsightedness [$+3s$], to emmetropia, or normal vision [$0s$], to extreme myopia [$-3s$]). The last column in Table 12.8 shows the W-B difference in the cutoff point for the diagnosis of myopia, which is $1s$ for all who had either mild or severe myopia. Unfortunately, mental test scores on these subjects were not reported, but from other studies one would expect the group diagnosed as myopic to score about $0.5s$ higher than the nonmyopic. Studies in Europe and in the United States have reported differences of about seven to eight IQ points between myopes and nonmyopes.

Because myopia appears to be pleiotropic with IQ, the black-white difference in myopia is consistent with the hypothesis of a genetic component in the racial IQ difference. Further studies would be needed to make it an importantly interesting hypothesis. For one thing, the pleiotropy of myopia is not yet all that firmly established. Although one study provides fairly strong evidence for it, confirming studies are needed before one can make any inferences in regard to racial differences. More crucial, it is not known if myopia and IQ are also pleiotropic in the black population; there are no published studies of the correlation between IQ and myopia in blacks. Failure to find such a relationship would nullify the hypothesis.

Other testable hypotheses could also be based on various highly heritable physical traits that are correlated with g (see Chapter 6), some of which show racial differences (e.g., the ability to taste phenylthiocarbamide, color vision, visual acuity, susceptibility to perceptual illusions). But it is first necessary to establish that the correlation of the physical trait with g is pleiotropic within each racial group.

As each specific gene in the human genome related to g is discovered -- a search that is getting underway -- a determination of the genes' frequencies in different populations may make it possible to estimate the minimum percentage of the between-race variance in g that has a genetic basis. Assuming that the genetic research on quantitative trait loci already underway continues apace, it is possible that the uncertainty regarding the existence, and perhaps even the magnitude, of genetic group differences in g could probably be resolved, should we so desire, within the first decade of the next century.

ENVIRONMENTAL CAUSES OF GROUP DIFFERENCES IN g

From the standpoint of research strategy, it is sensible to ask where one can best look for the environmental variables that are the most likely to cause the nongenetic component of the black-

white difference in g . The Factor X hypothesis encourages a search for nongenetic factors that are unique to the black-white difference and absent from individual differences among whites or among blacks. The default hypothesis leads us to look at the same kinds of environmental factors that contribute to g variance within each population as causal factors in the g difference between groups.

Among the environmental factors that have been shown to be important within either group, the between-families environmental variance markedly decreases after childhood, becoming virtually nil by late adolescence (see Chapter 7, pp. 179-81). In contrast, the within-family environmental variance remains fairly constant from early childhood to maturity, when it accounts for nearly all of the nongenetic variance and constitutes about 20 percent of the total true-score variance in psychometric g . The macroenvironmental variables responsible for the transient between-families variance in g would therefore seem to be an unlikely source of the observed population difference in g . A more likely source is the microenvironment that produces the within-family variance. The macroenvironment consists of those aspects of interpersonal behavior, values, customs, preferences, and life-style to which children are exposed at home and which clearly differ between families and ethnic groups in American society. The microenvironment consists of a great many small, often random, events that take place in the course of prenatal and postnatal life. Singly they have small effects on mental development, but in the aggregate they may have a large cumulative effect on the individual. These microenvironmental effects probably account for most of the nongenetic variance in IQ that remains after childhood.

This difference in the potency and persistence of the macro- and microenvironments has been consistently demonstrated in environmental enrichment and intervention programs specifically intended to provide underprivileged black children with the kinds of macroenvironmental advantages typically experienced by white middle-class children. They include use of educational toys and picture books, interaction with nurturing adults, attendance in a preschool or cognitively oriented day-care center, early adoption by well-educated white parents, and even extraordinarily intensive cognitive development programs such as the Milwaukee Project and the Abecedarian Project (Chapter 10, pp. 340-44). The effects of these programs on IQ and scholastic performance have generally been short-lived, and it is still debatable whether these improvements in the macroenvironment have actually raised the level of g at all. This is not surprising if we consider that the same class of environmental variables, largely associated with socioeconomic status (SES), has so little, if any, positive effect on g or on IQ beyond childhood within the white population. Recent research has shown that the kinds of macroenvironmental factors typically used to describe differences between white lower-middle class and white upper-middle class child-rearing environments and long thought to affect children's cognitive development actually have surprisingly little effect on IQ beyond childhood. The macroenvironmental variables associated with SES, therefore, seem unlikely sources of the black-white difference in g .

Hypothesizing environmental factors that are not demonstrably correlated with IQ within one or both populations is useless from the standpoint of scientific explanation. Unless an environmental variable can be shown to correlate with IQ, it has no explanatory value. Many environment-IQ correlations reported in the psychological literature, though real and significant, can be disqualified, however, because the relevant studies completely confound the environmental and the genetic causes of IQ variance. Multiple correlations between a host of environmental assessments and children's IQs ranging from below .50 to over .80 have been found for children reared by their biological parents. But nearly all the correlations found in these studies actually have a genetic basis. This is because children's IQs have 50 percent of their genetic variance in IQ in common with their biological parents, and the parents' IQs are highly correlated (usually about .70) with the very environmental variables that supposedly cause the variance in children's mental development. For children reared by adoptive parents for whom there is no genetic relationship, these same environmental assessments show little correlation with the children's IQs, and virtually zero correlation when the children have reached adolescence. The kinds of environmental variables that show little or no correlation with the IQs of the children who were adopted in infancy, therefore, are not likely to be able to explain IQ differences between subpopulations all living in the same general culture. This is borne out by the study of transracial adoptions (reviewed previously, pp. 472-78).

We can now review briefly the main classes of environmental variables that have been put forth to explain the black-white IQ difference, and evaluate each one in light of the above methodological criteria and the current empirical evidence.

Socioeconomic Status. Measures of SES are typically a composite of occupation, education, income, location of residence, membership in civic or social organizations, and certain amenities in the home (e.g., telephone, TV, phonograph, records, books, newspapers, magazines). Children's SES is that of their parents. For adults, SES is sometimes divided into "attained SES" and "SES of origin" (i.e., the SES of the parents who reared the individual). All of these variables are highly correlated with each other and they share a large general factor in common. Occupation (rank ordered on a scale from unskilled labor to professional and managerial) has the highest loading on this general SES factor.

The population correlations between SES and IQ for children fall in the range .30 to .40; for adults the correlations are .50 to .70, increasing with age as individuals approach their highest occupational level. There has probably been a higher degree of social mobility in the United States than in any other country. The attained SES of between one-third and one-half of the adult population in each generation ends up either above or below their SES of origin. IQ and the level of educational attainments associated with IQ are the best predictors of SES mobility. SES is an effect of IQ rather than a cause. If SES were the cause of IQ, the correlation between adults' IQ and their attained SES would not be markedly higher than the correlation between children's IQ and their parents' SES. Further, the IQs of adolescents adopted in infancy are not correlated with the SES of their adoptive parents. Adults' attained SES (and hence their SES as

parents) itself has a large genetic component, so there is a genetic correlation between SES and IQ, and this is so within both the white and the black populations. Consequently, if black and white groups are specially selected so as to be matched or statistically equate on SES, they are thereby also equated to some degree on the genetic component of IQ. Whatever IQ difference remains between the two SES-equated groups, therefore, does not represent a wholly environmental effect. (Because the contrary is so often declared by sociologists, it has been termed the sociologist's fallacy.)

When representative samples of the white and black populations are matched or statistically equated on SES, the mean IQ difference is reduced by about one-third. Not all of this five or six IQ points reduction in the mean W-B difference represents an environmental effect, because, as explained above, whites and blacks who are equated on SES are also more alike in the genetic part of IQ than are blacks and whites in general. In every large-scale study, when black and white children were matched within each level on the scale of the parents' SES, the children's mean W-B IQ difference increased, going from the lowest to the highest level of SES. A statistical corollary of this phenomenon is the general finding that SES has a somewhat lower correlation (by about .10) with children's IQ in the black than in the white population. Both of these phenomena simply reflect the greater effect of IQ regression toward the population mean for black than for white children matched on above-average SES, as previously explained in this chapter (pp. 467-72). The effect shows up not only for IQ but for all highly g-loaded tests that have been examined in this way. For example, when SAT scores were related to the family income levels of the self-selected students taking the SAT for college admission, Asians from the lowest income level scored higher than blacks from the highest, and black students scored more than one standard deviation below white students from the same income level. It is impossible to explain the overall subpopulation differences in g-loaded test performance in terms of racial group differences in the privileges (or their lack) associated with SES and income.

Additional evidence that W-B differences in cognitive abilities are not the same as SES differences is provided by the comparison of the profile of W-B differences with the profile of SES differences on a variety of psychometric tests that measure somewhat different cognitive abilities (in addition to g).

This is illustrated in the three panels of Figure 12.1. The W-B difference in the national standardization sample on each of the thirteen subtests of the Wechsler Intelligence Scale for Children-Revised (WISC-R) is expressed as a point-biserial correlation between age-controlled scale scores and race (quantitized as white = 1, black = 0). The upper (solid-line) profile in each panel shows the full correlations of race (i.e., W or B) with the age-scaled subtest scores. The lower (dashed-line) profile in each panel shows the partial correlations, with the Full Scale IQ partialled out. Virtually all of the g factor is removed in the partial correlations, thus showing the profile of W-B differences free of g. The partial correlations (i.e., W-B differences) fall to around zero and differ significantly from zero on only six of the thirteen subtests (indicated by

asterisks). The profile points for subtests on which whites outperform blacks are positive; those on which blacks outperform whites are negative (i.e., below zero).

Whites perform significantly better than blacks on the subtests called Comprehension, Block Design, Object Assembly, and Mazes. The latter three tests are loaded on the spatial visualization factor of the WISC-R. Blacks perform significantly better than whites on Arithmetic and Digit Span. Both of these tests are loaded on the short-term memory factor of the WISC-R. (As the test of arithmetic reasoning is given orally, the subject must remember the key elements of the problem long enough to solve it.) It is noteworthy that Vocabulary is the one test that shows zero W-B difference when g is removed. Along with Information and Similarities, which even show a slight (but nonsignificant) advantage for blacks, these are the subtests most often claimed to be culturally biased against blacks. The same profile differences on the WISC-R were found in another study based on 270 whites and 270 blacks who were perfectly matched on Full Scale IQ.

Panels B and C in Figure 12.11 show the profiles of the full and the partial correlations of the WISC-R subtests with SES, separately for whites and blacks. SES was measured on a five-point scale, which yields a mean W-B difference of 0.67 in standard deviation units. Comparison of the profile for race in Panel A with the profiles for SES in Panels B and C reveals marked differences. The Pearson correlation between profiles serves as an objective measure of their degree of similarity. The profiles of the partial correlations for race and for SES are negatively correlated: $-.45$ for whites; $-.63$ for blacks. The SES profiles for whites and for blacks are positively correlated: $+0.59$. While the profile of race X subtest correlations and the profile of SES X subtest correlations are highly dissimilar, the black profile of SES X subtest scores and the white profile of SES X subtest scores are fairly similar. Comparable results were found in another study that included racial and SES profiles based on seventy-five cognitive variables measured in a total sample of 70,000 high school students. The authors concluded, "[C]omparable levels of socioeconomic status tend to move profiles toward somewhat greater degrees of similarity, but there are also powerful causal factors that operate differentially for race [black-white] that are not revealed in these data. Degree of [economic] privilege is an inadequate explanation of the differences" (p. 205).

Race and SES Differences in Educational Achievement. Because the specific knowledge content of educational achievement tests is explicitly taught and learned in school, of course, scores on such tests reflect not only the individual's level of g but also the amount and type of schooling, the quality of teaching, and the degree of motivation for scholastic achievement. Nevertheless, tests of educational achievement are quite g -loaded, especially for groups of high school age with comparable years of schooling.

It is informative, therefore, to look at the black-white difference on achievement tests for the two most basic scholastic subjects, reading/verbal skills and mathematics, when a number of SES-related factors have been controlled. Such data were obtained on over 28,000 high school

students in two independent large-scale surveys, the National Longitudinal Survey of Youth (NLSY) and the National Education Longitudinal Survey (NELS). In the two studies, the actual W-B mean differences on three tests (Math, Verbal, Reading) ranged from about 0.75 to 1.25s. Regression analyses of the test scores obtained in each study controlled for a number of SES-related factors: family income, mother's education, father's education, age of mother at the birth of the proband, sex, number of siblings, mother single or married, mother working (or not), region of the country in which the proband lives.

When the effects of these SES factors on test scores statistically were removed by regression, the mean W-B differences in the NLSY were: for Math 0.49s, for Verbal 0.55s; in the NELS, for Math 0.59s, for Reading 0.51s. In a multiple-regression analysis for predicting the achievement test scores from twenty-four demographic and personal background variables, no other variable among the twenty-four had a larger predictive weight (independently of all the other variables in the regression equation) than the dichotomous W/B variable. Parents' education was the next most strongly predictive variable (independently of race and all other variables), averaging only about half as much predictive weight as the W/B variable. That most of the predictive power of parental education in these analyses is genetically mediated is inferred from the studies of individuals reared by adoptive parents, whose IQs and educational attainment, have a near-zero correlation with that of the adoptees. See Chapter 7.) Thus for measures of educational achievement, as for IQ, demographic and SES variables have been shown to account for only a small part of the W-B difference.

The Cumulative Deficit Theory. Cumulative deficit is really an empirical phenomenon that, in the 1960s, became a general theory of how environmental deprivation progressively decreased the IQ and scholastic performance of black children with increasing age relative to white age norms. The phenomenon itself is more accurately termed 'age-related decrement in IQ and achievement,' which is neutral as regards its nature and cause. The theory of cumulative deficit, its history, and empirical literature have been reviewed elsewhere. The theory says that environmental and educational disadvantages that cause a failure to learn something at an early age cause further failure at a later age and the resulting performance deficit, which affects IQ and scholastic achievement alike increases with age at an accelerating rate, accumulating like compound interest. At each stage of learning, the increasing deficit of prerequisite knowledge and skills hinders learning at each later stage of learning. This theory of the cause of shortfall in IQ and achievement of blacks and other poorly achieving group was a prominent feature of the rationale for the large-scale federal program intended to ameliorate these conditions begun in the 1960s -- interventions such as Head Start, compensatory education, and a host of experimental preschool programs for disadvantaged children.

The raw scores on all mental tests, including tests of scholastic achievement show an increasing divergence among individuals as they mature, from early childhood to the late teens. In other words, both the mean and the standard deviation of raw scores increase with age. Similarly, the mean W-B difference in raw scores increases with age. This age-related increase in the mean W-

B raw score difference, however, is not what is meant by the term "cumulative deficit." The cumulative deficit effect can only be measured at each age in term of the standardized scores (i.e., measures in unit of the standard deviation) for each age. A significant increase of the mean W-B difference in standardize scores (i.e., in s units) constitutes evidence for cumulative deficit, although this term does not imply the nature of its cause, which has remained purely hypothetical.

The mental test and scholastic achievement data of large-scale studies, such as those from the famous Coleman Report based on 450,000 pupils in 6,00 schools across the nation, failed to find any sign of the cumulative deficit effect for blacks in the nation as a whole. However, suggestive evidence was found for some school districts in the rural South, where the W-B difference in test of verbal ability increased from 1.5s to 1.7s to 1.9s in Grades 6, 9, and 12, respectively. These findings were only suggestive because they were entirely based on cross-sectional data (i.e., different samples tested at each grade level rather than longitudinal data (the same sample tested at different grade levels).

Cross-sectional studies of age effects are liable to migratory and demographic changes in the composition of a local population.

Another method with fewer disadvantages even than a longitudinal study (which can suffer from nonrandom attrition of the study sample) compares the IQs of younger and older siblings attending the same schools. Cumulative deficit would be revealed by consistent IQ differences in favor of younger (Y) rather than older (O) siblings. This is measured by the signed difference between younger and older siblings (i.e., Y-O) on age-standardization test scores that constitute an equal-interval scale throughout their full range. Averaged over a large number of sibling pairs, the mean Y-O difference represents only an environmental or nongenetic effect, because there is nothing in genetic theory that relates sibling differences to birth order. The expected mean genotypic value of the signed differences between younger and older full siblings is therefore necessarily zero. A phenotypic Y-O difference would indicate the presence of a cumulative IQ deficit with increasing age.

This method was applied to IQ data obtained from all of the full siblings from kindergarten through grade six in a total of seventeen schools in California that had about 60 percent white and 40 percent black pupils. In general, there was no evidence of a cumulative deficit effect, either for blacks or for whites, with the exception of blacks in the primary grades, who showed the effect only on the verbal part of the IQ test that required some reading skill; the effect was largely attributable to the black males' greater lag in early reading skills compared to the black females; in the early years of schooling, boys in general tend to advance less rapidly in reading than do girls. Blacks showed no cumulative deficit effect at all in nonverbal IQ, and beyond the elementary grades there was no trace of a cumulative deficit in verbal IQ.

Overall, the cumulative deficit hypothesis was not borne out in this California school district,

although the mean W-B IQ difference in this school population was greater than 1s. However, the black population in this California study was socioeconomically more advantaged and socially more integrated with the white population than is true for blacks in many other parts of the country, particular those in the rural South. It is possible that the California black pupils did not show a cumulative deficit in IQ because the vast majority of them had grown up in a reasonably good environment and the cumulative deficit phenomenon might be manifested only when the blacks' degree of environmental disadvantage falls below some critical threshold for a normal rate of mental growth.

Exactly the same methodology, based on Y-O sibling differences in IQ, was therefore applied in an entire school system of a county in rural Georgia. It perfectly exemplified a generally poor community, especially its black population, which was well below the national black average in SES. Although the school population (49 percent white and 51 percent black) had long since been racially desegregated when the test data were obtained, the blacks' level of scholastic performance was exceedingly low by national standards. The mean W-B IQ difference for the entire school population was 1.95s (white mean 102, SD 16.7; black mean 71, SD 15.1). If cumulative deficit were a genuine phenomenon and not an artifact of uncontrolled demographic variables in previous cross-sectional studies, the sibling methodology should reveal it in this rural Georgia community. One would be hard put to find a more disadvantaged black community, by all indices, anywhere in the United States. This study, therefore, provides a critical test of the cumulative deficit hypothesis.

The rural Georgia study included all of the full siblings of both racial groups from kindergarten through grade twelve. Appropriate forms of the same standardized IQ test (California Test of Mental Maturity) were used at each grade level. An examination of the test's scale properties in this population showed that it measured IQ as an interval scale throughout the full range of IQ at every age in both the black and white groups, had equally high reliability for both groups, and, despite the nearly two standard deviations IQ difference between the groups, IQ had an approximately normal distribution within each group.

No cumulative deficit effect could be detected in the white group. The Y-O sibling differences for whites showed no increase with age and they were uncorrelated with the age difference between siblings.

The result for blacks, however, was markedly different. The cumulative deficit effect was manifested at a high level of significance ($p < .001$). Blacks showed large decrements in IQ with increasing age that were almost linear from five to sixteen years of age, for both verbal and nonverbal IQ. For total IQ, the blacks had an average rate of IQ decrement of 1.42 points per year during their first ten or eleven years in school -- in all, a total decrement of about sixteen IQ points, or about half the total W-B difference of thirty-one IQ points that existed in this population.

It would be difficult to attribute the cause of this result to anything other than the effect of an exceedingly poor environment. A genetic hypothesis of the cumulative deficit effect seems highly unlikely in view of the fact that it was not found in blacks in the California study, although the sample size was large enough to detect even a very small effect size at a high level of statistical significance. Even if the blacks in California had, on average, a larger amount of Caucasian ancestry than blacks in rural Georgia, the cumulative deficit effect should have been evident, even if to a lesser degree, in the California group if genetic factors were involved. Therefore, the cause of the cumulative deficit, at least as observed in this study, is most probably of environmental origin. But the specific nature of the environmental cause remains unknown. The fact that it did not show up in the California sample suggests that a cumulative deficit does not account for any appreciable part of the overall W-B IQ difference of about 1s in nationally representative samples.

The overall W-B IQ difference of 1 .95s in the rural Georgia sample would be reduced to about 1s if the decrement attributable to the cumulative effect were removed. What aspects of the environment could cause that large a decrement? It would be worthwhile to apply the sibling method used in these studies in other parts of the country, and in rural, urban or "inner city," and suburban populations of whites and blacks to determine just how widespread this cumulative deficit effect is in the black population. It is probably the most promising strategy for discovering the specific environmental factors involved in the W-B IQ difference.

The Interaction of Race X Sex X Ability. In 1970, it came to my attention that the level of scholastic achievement was generally higher for black females than for black males. A greater percentage of black females than of black males graduate from high school, enter and succeed in college, pass high-level civil service examinations, and succeed in skilled and professional occupations. A comparable sex difference is not found in the white population. To investigate whether this phenomenon could be attributed to a sex difference in IQ that favored females relative to males in the black population, I proposed the hypothesis I called the race X sex X ability interaction. It posits a sex difference in g (measured as IQ), which is expressed to some extent in all of the "real life" correlates of g . Because of the normal distribution of g for both sexes, selection on criteria that demand levels of cognitive ability that are well above the average level of ability in the population will be most apt to reveal the hypothesized sex difference in g and all its correlates. Success in passing high-level civil service examinations, in admission to selective colleges, and in high-level occupations, all require levels of ability well above the population average. They should therefore show a large difference in the proportions of each sex that can meet these high selection criteria, even when the average sex difference in the population as a whole is relatively small. This hypothesis is shown graphically in Figure 12.12. For example, if the cutoff score on the criterion for selection is at the white mean IQ of 100 (which is shown as 1s above the black mean IQ of eighty-five), and if the black female-male difference (F-M) in IQ is only 0.2s (i.e., three IQ points), the F/M ratio above the cutoff score would be about 1.4 females to 1 male. If the selection cutoff score (X) is placed 2s above the black mean, the F/M ratio would be 1.6 females to 1 male.

This hypothesis seemed highly worthy of empirical investigation, because if the sex difference in IQ for the black population were larger than it is for the white population (in which it is presumed to be virtually zero), the sex difference could help identify specific environmental factors in the W-B IQ difference itself. It is well established that the male of every mammalian species is generally more vulnerable to all kinds of environmental stress than is the female. There are higher rates of spontaneous abortion and of stillbirths for male fetuses and also a greater susceptibility to communicable diseases and a higher rate of infant mortality. Males are also psychologically less well buffered against unfavorable environmental influences than are females. Because a higher proportion of blacks than of whites grow up in poor and stressful environmental conditions that would hinder mental development, a sex difference in IQ, disfavoring males, would be greater for blacks than for whites.

I tested this race X sex X ability interaction hypothesis on all of the test data I could find on white and black samples that provided test statistics separately for males and females within each racial group. The analyses were based on a collection of various studies which, in all, included seven highly g-loaded tests and a total of more than 20,000 subjects, all of school age and most below age thirteen. With respect to the race X sex interaction, the predicted effect was inconsistent for different tests and in different samples. The overall effect for the combined data showed a mean female-male (F-M) difference for blacks of +0.2s and for whites of +0.1s. Across various tests and samples, the F-M differences for whites and for blacks correlated +.54 ($p < .01$), indicating that similar factors for both races accounted for the slight sex difference, but had a stronger effect for blacks. With the large sample sizes, even these small sex differences (equivalent to 3 and 1.5 IQ points for blacks and whites, respectively) are statistically significant. But they are too small to explain the quite large differences in cognitively demanding achievements between male and female blacks. Apparently the sex difference in black achievement must be attributed to factors other than g per Se. These may be personality or motivational factors, or sexually differential reward systems for achievement in black society, or differential discrimination by the majority culture. Moreover, because the majority of subjects were of elementary school age and because girls mature more rapidly than boys in this age range, some part of the observed sex difference in test scores might be attributable to differing rates of maturation. Add to this the fact that the test data were not systematically gathered so as to be representative of the whole black and white populations of the United States, or even of any particular region, and it is apparent that while this study allows statistical rejection of the null hypothesis, it does so without lending strong support to the race X sex interaction hypothesis.

The demise of the hypothesized race X sex interaction was probably assured by a subsequent large-scale study that examined the national standardization sample of 2,000 subjects on the WISC-R, the 3,371 ninth-grade students in Project TALENT who were given an IQ test, and a sample of 152,944 pupils in grades 5, 8, and 11 in Pennsylvania, who were given a test measuring verbal and mathematical achievement. The subjects' SES was also obtained in all three data sets. In all these data, the only significant ($p < .05$ with an N of 50,000) evidence of a

race X sex X ability interaction was on the verbal achievement test for eleventh graders, and even it is of questionable significance when one considers the total number of statistical tests used in this study. In any case, it is a trifling effect. Moreover, SES did not enter into any significant interaction with race and sex.

Still another large data set used the Vocabulary and Block Design subtests of the WISC-R administered to a carefully selected national probability sample of 7,119 noninstitutionalized children aged six to eleven years. The Vocabulary + Block Design composite of the WISC-R has the highest correlation with the WISC-R Full Scale IQ of any other pair of subtests, and both Vocabulary and Block Design are highly g loaded. These data also showed no effects that are consistent with the race X sex X ability interaction hypothesis for either Vocabulary or Block Design. Similarly, the massive data of the National Collaborative Perinatal Project, which measured the IQs of more than 20,000 white and black children at ages four and seven years, yielded such a small interaction effect as to make its statistical significance virtually irrelevant.

Although the race X sex interaction hypothesis must now be discarded, it has nevertheless raised an important question about the environmental factors that have biological consequences for mental development as a possible cause of the W-B difference in g.

NONGENETIC BIOLOGICAL FACTORS IN THE W-B DIFFERENCE

The psychological, educational, and social factors that differ between families within racial groups have been found to have little, if any, effect on individual differences in the level of g after childhood. This class of variables, largely associated with socioeconomic differences between families, has similarly little effect on the differing average levels of g between native-born, English-speaking whites and blacks. By late adolescence, the IQs of black and white infants adopted by middle or upper-middle SES white parents are, on average, closer to the mean IQ of their respective populations than to that of either their adoptive parents or their adoptive parents' biological children. Preschool programs such as Head Start and the much more intensive and long-term educational interventions (e.g., the Milwaukee Project and the Abecedarian Project) have been shown to have little effect on g.

It is reasonable, therefore, to look beyond these strictly social and educational variables and to consider the nongenetic, or environmental, factors of a biological nature that may have adverse effects on mental development. These include prenatal variables such as the mother's age, general health, and life-style during pregnancy (e.g., maternal nutrition, smoking, drinking, drug habits), number of previous pregnancies, spacing of pregnancies, blood-type incompatibility (e.g., kernicterus) between mother and fetus, trauma, and history of X-ray exposure. To these can be added the many obstetrical and perinatal variables, including premature birth, low birth weight, duration of labor, forceps delivery, anoxia at birth. Postnatal factors shown to have adverse effects include neonatal and childhood diseases, head trauma, and malnutrition during the period of maximum growth of the brain (from birth to five years of age). Although each of

these biological factors singly may have only a very small average effect on IQ in the population, the cumulative effect of many such adverse microenvironmental factors on any one individual can produce a decrement in g that has significant consequences for that individual's educability. Also, certain variables, though they may have a large negative effect on later IQ for some individuals, occur with such low frequency in the population as to have a negligible effect on the total variance in IQ, either within or between groups.

The largest study of the relationship between these nongenetic factors and IQ is the National Collaborative Perinatal Project conducted by the National Institutes of Health. The study pooled data gathered from twelve metropolitan hospitals located in different regions of the United States. Some 27,000 mothers and their children were studied over a period of several years, starting early in the mother's pregnancy, through the neonatal period, and at frequent intervals thereafter up to age four years (when all of the children were given the Stanford Binet IQ test). Most of this sample was also tested at age seven years with the Wechsler Intelligence Scale for Children (WISC). About 45 percent of the sample children were white and 55 percent were black. The white sample was slightly below the national average for whites in SES; the black sample was slightly higher in SES than the national black average. The white mothers and black mothers differed 1.02 on a nonverbal IQ test. The mean W-B IQ difference for the children was 0.86s at age four years and 1.01s at age seven years.

A total of 168 variables (in addition to race) were screened. They measured family characteristics, family history, maternal characteristics, prenatal period, labor and delivery, neonatal period, infancy, and childhood. The first point of interest is that eighty-two of the 168 variables showed highly significant ($p < .001$) correlations with IQ at age four in the white or in the black sample (or in both). Among these variables, 59 (or 72 percent) were also correlated with race; and among the 33 variables that correlated .10 or more with IQ, 31 (or 94 percent) were correlated with race.

Many of these 168 variables, of course, are correlated with each other and therefore are not all independently related to IQ. However, a multiple regression analysis applied to the set of sixty-five variables for which there was complete data for all the probands in the study reveals the proportion of the total variance in IQ that can be reliably accounted for by all sixty-five variables. The regression analyses were performed separately within groups, both by sex (male-female) and by race (white-black), yielding four separate analyses. The percentage of IQ variance accounted for by the sixty-five independent variables (averaged over the four sex X race groups) was 22.7 percent. This is over one-fifth of total IQ variance.

However, not all of this variance in these sixty-five variables is necessarily environmental. Some of the IQ variance is attributable to regional differences in the populations surveyed, as the total subject sample was distributed over twelve cities in different parts of the country. And some of the variance is attributable to the mother's education and socioeconomic status. (This information was not obtained for fathers.) Mother's education alone accounts for 13 percent of

the children's IQ variance, but this is most likely a genetic effect, since adopted children of this age show about the same degree of relationship to their biological mothers with whom they have had no social contact. The proband's score on the Bayley Scale obtained at eight months of age also should not be counted as an environmental variable. This yields four variables in the regression analysis that should not be counted strictly as environmental factors -- region, mother's education, SES, and child's own test score at eight months. With the effects of these variables removed, the remaining sixty-one environmental variables account for 3.4 percent of the variance in children's IQ, averaged over the four race X sex groups. Rather unexpectedly, the proportion of environmental variance in IQ was somewhat greater in the white sample than in the black (4.2 percent vs. 2.6 percent). The most important variable affecting the probands' IQ independently of mother's education and SES in both racial groups was mother's age, which was positively correlated with child's IQ for mothers in the age range of twelve to thirty-six years.

How can we interpret these percentage figures in terms of IQ points? Assuming that the total variance in the population consisted only of the variance contributed by this large set of environmental variables, virtually all of a biological but nongenetic nature, the standard deviation of true-score IQs in the population would be 2.7 IQ points. The average absolute IQ difference between pairs of individuals picked at random from this population would be three IQ points. This is the average effect that the strictly biological environmental variables measured in the Collaborative Project has on IQ. It amounts to about one-fifth of the average mean W-B IQ difference.

Unfortunately, the authors of the Collaborative Project performed only within-group regression analyses. They did not enter race as an independent variable into the multiple regression analysis, stating explicitly that the independent effect of race was not assessed. A regression analysis in which race, as an independent variable, was entered after all of the nongenetic environmental variables could have shown the independent effect of race on IQ when the effect of the environmental variables was removed. This would have allowed testing of the strict form of the default hypothesis. It posits that the environmental variance between groups is the same as the environmental variance within groups, in which case about three points of the fifteen points mean W-B IQ difference would be attributable to nongenetic biological environment, assuming that all of these environmental factors worked in a harmful direction for blacks.

There are three reasons to suspect that this study underrepresents the effects of the nongenetic biological environment on the IQ of blacks in the general populations.

1. The black sample is somewhat above average in SES compared to the black population as a whole. What today is termed the underclass, which includes some one-fourth to one-third of the total black population, is underrepresented in the study sample; much of the U.S. black population is at or below the zero point on the scale of SES used in this study, as shown in Figure 12.13. The biological factors that adversely affect IQ almost certainly have a higher incidence in this poorest segment of the population, which was underrepresented in the

Collaborative Project.

2. The selection of mothers entering the study excluded all women who had not received care in the prenatal clinic from early in their pregnancies. All of the subjects in the study, both black and white, received prenatal care, while many underclass mothers do not receive prenatal care. The Project mothers also received comparable high-quality obstetrical and perinatal treatment, followed up with comparable neonatal and infant medical care provided by the collaborating hospitals. Pregnancies in the underclass are typically without these medical advantages.

3. Certain environmental factors that in recent years have been studied in relation to IQ, such as nutrition, breast feeding, fetal alcohol syndrome, and drug abuse, were not considered in the Collaborative Project conducted three decades ago. The causal role of these factors should be examined, as should the increasing incidence of premature delivery and low birth weight. The latter variables are in fact the strongest correlates of low IQ.

Low Birth Weight (LBW). Infant mortality can be viewed as the extreme point on a continuum of pathology and reproductive casualty. The rate of neonatal and infant mortality in a particular population, therefore, serves as an indicator of other sublethal but nevertheless damaging health conditions, which negatively affect children's mental development. While the infant mortality rate has steadily declined in the population as a whole over the last several decades, it is still about twice as great in the U.S. black population (17.6 per 1,000 live births) as in the white population (8.5 per 1,000). Other minority populations differ only slightly from whites; of the groups with lower SES than the white average (such as Hispanics, American Indians, and native Alaskans) the infant mortality rate averages about 8.6 per 1,000. Asians have by far the lowest average, about 4.3 per 1,000.

LBW is defined as a birth weight under 2,500 grams (5.5 pounds). It represents a region on the risk continuum of which infant death is the end point. Therefore, the rates of LBW and of infant mortality are highly correlated across different subpopulations. Although premature birth incurs its own risks for the neonate's development, it is not the same as LBW, because a premature baby may have normal weight for its gestational age. LBW also occurs in full-term babies, who are thereby at increased risk for retarded mental development and for other developmental problems, such as behavioral adjustment, learning disabilities, and poor scholastic performance. Throughout the full range of LBW, all of these developmental risks increase as birth weight decreases. For present purposes, it is important to note that a disproportionate number of the babies born to black women are either premature or of LBW. Although black women have about 17 percent of all the babies born in the United States today, they have about 32 percent of the LBW babies.

The mother's age is the strongest correlate of LBW and is probably its chief causal factor. Teenage mothers account for about one-fourth of LBW babies. Even teenage girls under age eighteen who have had proper health care during pregnancy are twice as likely to have

premature or LBW babies as women in their twenties. One suggested explanation is that teenage girls are still in their growing period, which causes some of the nutrients essential for normal development to be diverted from the growing fetus to the growing mother. In addition to teenage pregnancy, other significant correlates of LBW are unmarried status, maternal anemia, substance abuse of various kinds, and low educational levels. SES per se accounts for only about 1 percent of the total variance in birth weight, and race (black/white) has a large effect on birth weight independently of SES. Most of the W-B difference in birth weight remains unaccounted for by such variables as SES, poverty status, maternal age, and education. Prenatal medical care, however, has a small effect.

LBW, independently of SES, is related to low maternal IQ. Controlling for IQ reduces the B-W disparity in the percentage of LBW babies by about one-half. But even college-educated black women have higher rates of LBW babies and therefore also higher rates of infant mortality than occur for white women of similar educational background (10.2 per thousand vs. 5.4 per thousand live births). When black babies and white babies, both born to college-educated parents, are statistically equated for birth weight, they have the same mortality rates in the first year of life. In the general population, however, black infants who are not of LBW have a mortality rate almost twice that of white infants.

The cause of the high rate of LBW (and the consequently higher infant mortality rate) in the black population as compared with other racial or ethnic groups, including those that are less advantaged than blacks, remains a mystery. Researchers have been able to account for only about half of the disparity in terms of the combined obvious factors such as poverty, low levels of SES, education, health and prenatal care, and mother's age. The explanations run the gamut from the largely genetic to the purely environmental. Some researchers regard LBW as an inherent, evolved, genetic racial characteristic. Others have hypothesized that black mothers may have subtle health problems that span generations, and some have suggested subtle but stressful effects of racism as a cause.

Since the specific causes of LBW largely remain unidentified while the survival rate of LBW babies has been increasing over the past 20 years, researchers are now focusing on ways to mitigate its risks for developmental disabilities and to enhance the cognitive and behavioral development of LBW babies. The experimental treatment was highly similar to that provided in the Abecedarian Project described in Chapter 10 (pp. 342-44). The largest program of this kind, conducted with nearly one thousand LBW infants in eight states, showed large Stanford-Binet IQ gains (compared against a control group) for LBW children when they were tested at thirty-six months of age. The heavier LBW probands (BW between 2,001 and 2,500 grams) scored an average of 13.2 IQ points above the untreated control group (98.0 vs. 84.8); the lighter probands (<2,000 grams) scored 6.6 IQ points above the controls (91 vs 84.4). Because IQ measured at thirty-six months is typically unstable, follow-up studies are crucial to determine if these promising IQ gains in the treated group would persist into the school years. The data obtained in the first follow-up, conducted when the children were five years of age, show that the apparent

initial gain in IQ had not been maintained; the intervention group scored no higher than the control group. There was a further follow-up at age eight, but its results have not yet been reported.

A study of forty-six LBW black and forty-six LBW white children matched for gestational age and birth weight (all between 1,000 and 2,500 grams and averaging 1,276 grams for blacks and 1,263 grams for whites) showed that when the degree of LBW and other IQ-related background variables were controlled, the W-B IQ difference, even at three years of age, was nearly the same as that found for the general population. None of the LBW children in these selected samples had any chronic illness or neurological abnormality; all were born to mothers over eighteen years of age and had parents who were married. The black mothers and white mothers were matched for educational level. (Black mothers actually had slightly more education than white mothers, although the difference was statistically insignificant, $t < 1$). When the children were tested at thirty-three to thirty-four months, the mean Stanford-B met IQ of the black and the white groups was 90 and 104, respectively, a difference of 1s. In the same study, groups of middle class black and white children of normal birth weight and gestational age, matched on maternal education, had a mean Stanford-Binet IQ of ninety-seven and 111, respectively (a 1.2s difference).

Nutrition. A most remarkable study conducted at Cambridge University showed that the average IQ of preterm, LBW babies was strongly influenced by whether the babies received mother's milk or formula while in hospital. The probands were 300 babies who weighed under 1,850 grams at birth. While in hospital, 107 of the babies received formula, and 193 received mother's milk. The effects of breast feeding per se were ruled out (at least while the babies were in hospital), as all of the babies were fed by tube. At 7.5 to eight years of age, WISC-R IQs were obtained for all 300 children. Astonishingly, those who had received maternal milk outscored those who had been formula-fed by 10.2 IQ points (103.0 vs. 92.8). The Verbal and Performance scales showed identical effects. After a regression analysis that adjusted for confounding factors (SES, mother's age and education, birth weight, gestational age, birth rank, sex, and number of days in respirator), the difference between the two groups was still a highly significant 8.3 IQ points. Not all of the group who received mother's milk had it exclusively; some received variable proportions of mother's milk and formula. It was therefore possible to perform a critical test of whether the effect was genuinely attributable to the difference between mother's milk and formula or was attributable to some other factor. There was in fact a significant linear dose-response relationship between the amount of mother's milk the babies received and IQ at age 7.5 to eight years. Whether the milk was from the baby's own mother or from donors, it had a beneficial effect on IQ compared against the formula. The study did not attempt to determine whether mother's milk has a similarly advantageous effect for babies who are full-term and of normal birth weight.

The results, however, would seem to be highly relevant to the IQ of black children in contemporary U.S. for two reasons: (1) as was already pointed out, black infants are much more

frequently of LBW than are those of other racial/ethnic groups, and (2) they are much less frequently breast fed. Surveys of the National Center for Health Statistics show that, as of 1987, 61.1 percent of non-Hispanic white babies and 25.3 percent of non-Hispanic black babies are breast fed. Black women who breast feed also end nursing sooner than do white mothers. These data suggest that some part of the average W-B IQ difference may be attributable to the combined effects of a high rate of LBW and a low frequency of breast feeding. Nationwide in the 1940s and 1950s, breast feeding declined markedly to less than 30 percent, as greater numbers of women entered the work force. But since the late 1950s there has been an overall upward trend in the percentage of babies who are breast fed, now exceeding 60 percent.

The practice of breast feeding itself is positively correlated with SES, maternal age and education, and, interestingly, with birth weight. The frequency of breast feeding for LBW babies (<2,500 grams) is only 38.4 percent as against 56.1 percent for babies of normal birth weight (>2,500 grams). But as regards mental development it is probably the LBW babies that stand to benefit the most from mother's milk. Human milk apparently contains factors that affect nervous system development, probably long-chain lipids, hormones, or other nutrients involved in brain growth, that are not present in formulas.

More generally, Eysenck has hypothesized that nutritional deficiencies may be major nongenetic cause of the W-B IQ difference and that research should be focused on dietary supplements to determine their effect on children's IQ. He is not referring here to the type of malnutrition resulting from low caloric intake and insufficient protein, which is endemic in parts of the Third World but rare in the United States. Rather, he is referring to more or less idiosyncratic deficiencies associated with the wide range of individual differences in the requirements for certain vitamins and minerals essential for optimal brain development and cognitive functions. These individual differences can occur even among full siblings reared together and having the same diet. The dietary deficiency in these cases is not manifested by the gross outward signs of malnutrition seen in some children of Third World countries, but can only be diagnosed by means of blood tests. Dietary deficiencies, mainly in certain minerals and trace elements, occur even in some middle-class white families that enjoy a normally wholesome diet and show no signs of malnutrition. Blood samples were taken from all of the children in such families prior to the supplementation of certain minerals to the diet and later analyzed. They revealed that only those children who showed a significant IQ gain (twice the test's standard error of measurement, or nine IQ points) after receiving the supplements for several months previously showed deficiencies of one or more of the minerals in their blood. The children for whom the dietary supplement resulted in IQ gains were called "responders." The many children who were nonresponders showed little or no blood evidence of a deficiency in the key nutrients. Most interesting from a theoretical standpoint is that the IQ gains showed up on tests of fluid g (Gf), which measures immediate problem-solving ability, but failed to do so on tests of crystallized g (Gc), such as general information and vocabulary, which measure the past learning that had taken place before dietary supplements were begun. Eysenck believes it is more likely that a much larger percentage of black children than of white children have a deficiency of the

nutritional elements that, when supplemented in the diet, produce the observed gain in G_f , which eventually, of course, would also be reflected in G_c through the child's improved learning ability. This promising hypothesis, which has not yet been researched with respect to raising black children's level of g , is well worth studying.

Drug Abuse during Pregnancy. Many drugs can be more damaging to the developing fetus than to an adult, and drug abuse takes a higher toll on the mental development of newborns in the underclass than it does in the general population. Among all drugs, prenatal exposure to alcohol is the most frequent cause of developmental disorders, including varying degrees of mental retardation. Fetal alcohol syndrome (FAS), a severe form of prenatal damage caused by the mother's alcohol intake, is estimated to affect about three per 1,000 live births. The signs of FAS include stunted physical development and characteristic facial features, besides some degree of behavioral impairment -- at school age about half of such children are diagnosed as mentally retarded or as learning disabled. The adverse effect of prenatal exposure to alcohol on the infant's later mental development appears to be a continuous variable; there is no safe threshold of maternal alcohol intake below which there is zero risk to the fetus. Therefore the U.S. Surgeon General has recommended that women not drink at any time during pregnancy. Just how much of the total population variance in IQ might be attributed to prenatal alcohol is not known, but in the underclass segment of the population its effect, combined with other microenvironmental factors that lower IQ, is apt to be considerable.

After alcohol, use of barbiturates, or sedatives like drugs, by pregnant women is the most prevalent source of adverse effects on their children's IQ. Between 1950 and 1970, an estimated twenty-two million children were born in the United States to women who were taking prescribed barbiturates. Many others, without prescription, abused these drugs. Two major studies were conducted in Denmark to determine the effect of phenobarbital, a commonly used barbiturate, on the adult IQ of men whose mothers had used this drug during pregnancy. The men's IQs were compared with the IQs of controls matched on ten background variables that are correlated with IQ, such as proband's age, family SES when the probands were infants, parents' ages, whether the pregnancy was "wanted" or "not wanted," etc. Further control of background variables was achieved statistically by a multiple regression technique. In the first study, IQ was measured by the Wechsler Adult Intelligence Scale (WAIS), an individually administered test; the second study used the Danish Military Draft Board Intelligence Test, a forty-five-minute group test. In both studies the negative effect of prenatal phenobarbital on adult IQ, after controlling for background variables, was considerable. In the authors' words: "The individuals exposed to phenobarbital are not mentally retarded nor did they have any obvious physical abnormalities. Rather, because of their exposure more than 20 years previously, they ultimately test at approximately 0.5 SD or more lower on measured intelligence than otherwise would have been expected. Analysis of various subclasses of the total sample showed that the negative drug exposure effect was greater among those from lower SES background, those exposed in the third trimester and earlier, and the offspring of an unwanted pregnancy.

AD HOC THEORIES OF THE WHITE-BLACK IQ DIFFERENCE

The totality of environmental factors now known to affect IQ within either the white or the black population taken together cannot account for a larger amount of the total variance between groups than does the default hypothesis. The total between-populations variance accounted for by empirically demonstrable environmental factors does not exceed 20 to 30 percent. According to the default hypothesis, the remaining variance is attributable to genetic factors. But one can still eschew genetic factors and instead hypothesize a second class of nongenetic factors to explain the observed differences -- factors other than those already taken into account as sources of nongenetic variance within groups. However, exceptionally powerful effects would have to be attributed to these hypothesized nongenetic factors if they are to explain fully the between-groups variance that the default hypothesis posits as genetic.

The explanations so far proposed to account for so large a part of the IQ variance in strictly nongenetic terms involve subtle factors that seem implausible in light of our knowledge of the nature and magnitude of the effects that affect IQ. Many researchers in the branches of behavioral science related to this issue, as opposed to journalists and commentators, are of the opinion that the W-B difference in IQ involves genetic factors. A questionnaire survey conducted in 1987 solicited the anonymous opinions of 661 experts, most of them in the fields of differential psychology, psychometrics, and behavioral genetics. Here is how they responded to the question: "Which of the following best characterizes your opinion of the heritability of the black-white difference in IQ?"

15% said: The difference is entirely due to environmental variation.

1 % said: The difference is entirely due to genetic variation.

45% said: The difference is a product of both genetic and environmental variation.

24% said: The data are insufficient to support any reasonable opinion.

14% said: They did not feel qualified to answer the question.

Those behavioral scientists who attribute the difference entirely to the environment typically hypothesize factors that are unique to the historical experience of blacks in the United States, such as a past history of slavery, minority status, caste status, white racism, social prejudice and discrimination, a lowered level of aspiration resulting from restricted opportunity, peer pressure against "acting white," and the like. The obvious difficulty with these variables is that we lack independent evidence that they have any effect on *g* or other mental ability factors, although in some cases one can easily imagine how they might adversely affect motivation for certain kinds of achievement. But as yet no mechanism has been identified that causally links them to *g* or other psychometric factors. There are several other problems with attributing causality to this

class of variables:

1. Some of the variables (e.g., a past history of slavery, minority or caste status) do not explain the W-B 1s to 1.5s mean difference on psychometric tests in places where blacks have never been slaves in a nonblack society, or where they have never been a minority population, or where there has not been a color line.
2. These theories are made questionable by the empirical findings for other racial or ethnic groups that historically have experienced as much discrimination as have blacks, in America and other parts of the world, but do not show any deficit in mean IQ. Asians (Chinese, Japanese, East Indian) and Jews, for example, are minorities (some are physically identifiable) in the United States and in other countries, and have often experienced discrimination and even persecution, yet they perform as well or better on g-loaded tests and in g-loaded occupations than the majority population of any of the countries in which they reside. Social discrimination per se obviously does not cause lower levels of g. One might even conclude the opposite, considering the minority subpopulations in the United States and elsewhere that show high g and high g-related achievements, relative to the majority population.
3. The causal variable posited by these theories is unable to explain the detailed empirical findings, such as the large variability in the size of the W-B difference on various kinds of psychometric tests. As noted in Chapter 11, most of this variability is quite well explained by the modified Spearman hypothesis. It states that the size of the W-B difference on various psychometric tests is mainly related to the tests' g loadings, and the difference is increased if the test is also loaded on a spatial factor and it is decreased if the test is also loaded on a short-term memory factor. It is unlikely that broad social variables would produce, within the black and white populations, the ability to rank-order the various tests in a battery in terms of their loadings on g and the spatial and memory factors and then to distribute their effort on these tests to accord with the prediction of the modified Spearman hypothesis. (Even Ph.D. psychologists cannot do this.) Such a possibility is simply out of the question for three-year-olds, whose performance on a battery of diverse tests has been found to accord with Spearman's hypothesis (see Chapter 11, p. 385). It is hard to even imagine a social variable that could cause systematic variation in the size of the W-B difference across different tests that is unrelated to the specific informational or cultural content of the tests, but is consistently related to the tests' g loadings (which can only be determined by performing a factor analysis).
4. Test scores have the same validity for predicting educational and occupational performance for all American-born, English-speaking subpopulations whatever their race or ethnicity. Blacks, on average, do not perform at a higher level educationally or on the job, relative to other groups, than is predicted by g-loaded tests. An additional ad hoc hypothesis is required, namely, that the social variables that depress blacks' test scores must also depress blacks' performance on a host of nonpsychometric variables to a degree predicted by the regression of the nonpsychometric variables on the psychometric variables within the white population. This seems highly

improbable. In general, the social variables hypothesized to explain the lower average IQ of blacks would have to simulate consistently all of the effects predicted by the default hypothesis and Spearman's hypothesis. To date, the environmental theories of the W-B IQ difference put forward have been unable to do this. Moreover, it is difficult or impossible to perform an empirical test of their validity.

A theory that seems to have gained favor among some social anthropologists is the idea of "caste status" put forth by the anthropologist John Ogbu. He states the key point of his theory as follows: "The people who have most difficulty with IQ tests and other forms of cognitive tasks are involuntary or nonimmigrant minorities. This difficulty arises because their cultures are not merely different from that of the dominant group but may be in opposition to the latter. Therefore, the tests acquire symbolic meanings for these minorities, which cause additional but as yet unrecognized problems. It is more difficult for them to cross cognitive boundaries.

Ogbu's answer to criticism number 2 (above) is to argue that cultural factors that depress IQ do so only in the case of involuntary or nonimmigrant minorities and their descendants. In the United States this applies only to blacks (who were brought to America involuntarily to be sold as slaves) and native Americans (who score, on average, intermediate between blacks and whites on tests of fluid g). This theory does not account for the relatively high test scores and achievements of East Indians in Africa, whose ancestors were brought to Africa as indentured laborers during the nineteenth century, but Ogbu could reply that the indentured Indians were not truly involuntary immigrants. American blacks, in Ogbu's theory, have the status of a caste that is determined by birth and from which there is no mobility. Lower-caste status, it is argued, depresses IQ. Ogbu cites as evidence the Harijans (untouchables) of India and the Burakumi in Japan as examples. (The Burakumi constitute a small subpopulation of Asian origin that engages in work the Japanese have traditionally considered undesirable, such as tanning leather.) Although it is true that these "lower-caste" groups generally do have lower test scores and perform less well in school than do higher-status groups in India or Japan, the body of psychometric evidence is much less than that for American blacks. We know hardly anything regarding the magnitude or psychometric nature or the degree of genetic selection for g in the origins of these caste-like groups in India and Japan.

Ogbu also argues that conventional IQ tests measure only those types of cognitive behavior that are culturally valued by Western middle-class societies, and IQ tests therefore inevitably discriminate against minorities within such societies. But since such tests have equal predictive validity for blacks and whites, this would have to imply that performance on the many practical criteria predicted by the tests is also lowered by involuntary but not voluntary minority status. According to Ogbu, the "Western intelligence" measured by our psychometric tests represents only a narrow set of specialized cognitive abilities and skills. These have been selected on the basis of Western values from the common species pool of capabilities for adaptation to specific environmental circumstances. It logically follows, then, that the g factor and the spatial factor themselves represent specialized Western cognitive skills. The question that Ogbu neither asks

nor answers is why this set of Western-selected abilities has not been acquired to the same degree by a population of African descent that has been exposed to a Western society for many generations, while first-generation immigrants and refugees in America who came from the decidedly non-Western Oriental and East Indian cultures soon perform on a par with the dominant population of European descent.

A similar view of racial and ethnic IQ differences has been expressed by the economist Thomas Sowell. He does not offer a formal or explanatory theory, but rather a broad analogy between American blacks and other ethnic and national groups that have settled in the United States at different times in the past. Sowell points out that many immigrant groups performed poorly on tests at one time (usually soon after their arrival in America) and had relatively low educational standing, which limited their employment to low-paying jobs. The somewhat lower test scores of recent immigrants are usually attributable to unfamiliarity with the English language, as evidenced by their relatively superior performance on nonverbal tests. Within a single generation, most immigrant groups (typically those from Europe or Asia) performed on various intellectual criteria at least on a par with the established majority population. Sowell views the American black population as a part of this same general phenomenon and expects that in due course it, too, will rise to the overall national level. Only one generation, he points out, has grown up since inception of the Civil Rights movement and the end of de jure segregation.

But Sowell's analogy between blacks and other immigrant groups seems strained when one examines the performance of comparatively recent arrivals from Asia. The W-B difference in IQ (as distinguished from educational and socioeconomic performance) has not decreased significantly since World War I, when mental tests were first used on a nationwide scale. On the other hand, the children of certain recent refugee and immigrant groups from Asia, despite their different language and culture, have scored as high as the native white population on nonverbal IQ tests and they often exceed the white average in scholastic performance. Like Ogbu, Sowell does not deal with the detailed pattern of psychometric differences between blacks and whites. He attributes the lower black performance on tests involving abstract reasoning ability to poor motivation, quoting a statement by observers that black soldiers tested during World War I tended to "lapse into inattention and almost into sleep" during abstract tests." Spearman, to the contrary, concluded on the basis of factor analyzing more than 100 varied tests that "abstractness" is one of the distinguishing characteristics of the most highly g-loaded tests.

Recently, a clearly and specifically formulated hypothesis, termed stereotype threat, has been proposed to explain at least some part of the black shortfall on cognitive tests. It should not be classed as a Factor X theory, because specific predictions can be logically derived from the hypothesis and tested empirically. Its authors have done so, with positive, though somewhat limited, results.

Stereotype threat is defined as the perceived risk of confirming, as self-characteristic, a negative stereotype about one's group. The phenomenon has been demonstrated in four independent

experiments. Groups of black and white undergraduates at Stanford University took mentally demanding verbal tests under preliminary instructions that were specifically intended to elicit stereotype threat. This was termed the diagnostic condition, since the instructions emphasized that the student's score (which they would be given) would be a true indicator of their verbal ability and of their limitations. Their test performance was statistically compared with that of a control group, for whom the preliminary instructions were specifically intended to minimize stereotype threat by making no reference to ability and telling the subjects that the results were being used only for research on difficult verbal problems. This was termed the nondiagnostic condition. Under both conditions, subjects were asked to do their best. The theoretically predicted outcome is that the difference in test performance between the diagnostic and the nondiagnostic conditions will be greater for blacks than for whites. With the black and white groups statistically equated for SAT scores, the hypothesis was generally borne out in the four studies, although the predicted interaction (race X condition) in two of the experiments failed to reach the conventional 5 percent level of confidence.

Standard deviations were not reported for any of the performance measures, so the effect size of the stereotype threat cannot be precisely determined. From the reported analysis of variance, however, I have estimated the effect size to be about 0.3s, on average. Applied to IQ in the general population, this would be equivalent to about five IQ points. Clearly, the stereotype threat hypothesis should be further studied using samples of blacks and whites that are less highly selected for intellectual ability than are the students at Stanford. One wonders if stereotype threat affects the IQ scores even of preschool-age children (at age three), for whom the W-B difference is about 1s. Do children at this age have much awareness of stereotypes?

In fact, the phenomenon of stereotype threat can be explained in terms of a more general construct, test anxiety, which has been studied since the early days of psychometrics. Test anxiety tends to lower performance levels on tests in proportion to the degree of complexity and the amount of mental effort they require of the subject. The relatively greater effect of test anxiety in the black samples, who had somewhat lower SAT scores, than the white subjects in the Stanford experiments constitutes an example of the Yerkes-Dodson law. It describes the empirically observed nonlinear relationship between three variables: (1) anxiety (or drive) level, (2) task (or test) complexity and difficulty, and (3) level of test performance. According to the Yerkes-Dodson law, the maximal test performance occurs at decreasing levels of anxiety as the perceived complexity or difficulty level of the test increases (see Figure 12.14). If, for example, two groups, A and B, have the same level of test anxiety, but group A is higher than group B in the ability measured by the test (so group B finds the test more complex and difficult than does group A), then group B would perform less well than group A. The results of the Stanford studies, therefore, can be explained in terms of the Yerkes-Dodson law, without any need to postulate a racial group difference in susceptibility to stereotype threat or even a difference in the level of test anxiety. The outcome predicted by the Yerkes-Dodson law has been empirically demonstrated in large groups of college students who were either relatively high or relatively low in measured cognitive ability; increased levels of anxiety adversely affected the intelligence

test performance of low ability students (for whom the test was frustratingly difficult) but improved the level of performance of high-ability students (who experienced less difficulty).

This more general formulation of the stereotype threat hypothesis in terms of the Yerkes-Dodson law suggests other experiments for studying the phenomenon by experimentally manipulating the level of test difficulty and by equating the tests' difficulty levels for the white and black groups by matching items for percent passing the item within each group. Groups of blacks and whites should also be matched on true-scores derived from g-loaded tests, since equating the groups statistically by means of linear covariance analysis (as was used in the Stanford studies) does not adequately take account of the nonlinear relationship between anxiety and test performance as a function of difficulty level.

Strong conclusions regarding the stereotype threat hypothesis are unwarranted at present, as the total evidence for it is based on fairly small samples of high-ability university students, with results of marginal statistical significance. Research should be extended to more representative samples of the black and white populations and using standard mental test batteries under normal testing conditions except, of course, for the preliminary instructions needed to manipulate the experimental variable (that is, the inducement of stereotype threat). Further, by conducting the same type of experiment using exclusively white (or black) subjects, divided into lower- and higher-ability groups, it might be shown that the phenomenon attributed to stereotype threat has nothing to do with race as such, but results from the interaction of ability level with test anxiety as a function of test complexity.

In contrast to these various ad hoc hypotheses intended to explain the average W-B population difference in cognitive ability, particularly g, the default hypothesis has the attributes of simplicity, internal coherence, and parsimony of explanation. Further, it does not violate Occam's razor by treating one particular racial population as a special case that is culturally far more different from any other populations. The size of the cultural difference that needs to be hypothesized by a purely environmental theory of the W-B difference is far greater than the relatively small genetic difference implied by our evolution from common human ancestors.

The default hypothesis explains differences in g between populations in terms of quantitative variation in the very same genetic and environmental factors that influence the neural substrate of g and cause individual variation within all human populations. This hypothesis is consistent with a preponderance of psychometric, behavior-genetic, and evolutionary lines of evidence. And like true scientific hypotheses generally, it continually invites empirical refutation. It should ultimately be judged on the same basis, so aptly described by the anthropologist Owen Lovejoy, for judging the Darwinian theory of human evolution: "Evolutionary scenarios must be evaluated much in the same way that jury members must judge a prosecutor's narrative. Ultimately they must make their judgment not on the basis of any single fact or observation, but on the totality of the available evidence. Rarely will any single item of evidence prove pivotal in determining whether a prosecutor's scenario or the defense's alternative is most likely to be

correct. Many single details may actually fail to favor one scenario over another. The most probable account, instead, is the one which is the most internally consistent -- the one in which all the facts mesh together most neatly with one another and with the motives in the case. Of paramount importance is the economy of explanation. There are always alternative explanations of any single isolated fact. The greater the number of special explanations required in a narrative, however, the less probable its accuracy. An effective scenario almost always has a compelling facility to explain a chain of facts with a minimum of such special explanations. Instead the pieces of the puzzle should fall into place."

Notes:

4. One often hears it said that the genetic differences within racial groups (defined as statistically different breeding populations) is much greater than the differences between racial groups. This is true, however, only if one is comparing the range of individual differences on a given characteristic (or on a number of characteristics) within each population with the range of the differences that exist between the means of each of the separate populations on the given characteristic. In fact, if the differences between the means of the various populations were not larger than the mean difference between individuals within each population, it would be impossible to distinguish different populations statistically. Thinking statistically in terms of the analysis of variance, if we obtained a very large random sample of the world's population and computed the total variance (i.e., the total sum of squares based on individuals) of a given genetic character, we would find that about 85 percent of the total genetic variance exists within the several major racial populations and 15 percent exists between these populations. But when we then divide the sum of squares (SS) between populations by its degrees of freedom to obtain the mean square (MS) and we do the same for the sum of squares within populations, the ratio of the two mean squares, i.e., Between MS/Within MS, (known as the variance ratio, or F ratio, named for its inventor, R.A. Fischer) would be an extremely large value and, of course, would be highly significant statistically, thus confirming the population differences as an objective reality.

5. Among the genetically conditioned physical differences in central tendency, nearly all attributable to natural selection, that exist between various contemporary breeding populations in the world are: pigmentation of skin, hair, and eyes, body size and proportions, endocranial capacity, brain size, cephalic index (100 X head-width/head-length), number of vertebrae and many other skeletal features, bone density, hair form and distribution, size and shape of genitalia and breasts, testosterone level, various facial features, interpupillary distance, visual and auditory acuity, color blindness, myopia (nearsightedness), number and shape of teeth, fissural patterns on the surfaces of teeth, age at eruption of permanent teeth, consistency of ear wax, blood groups, blood pressure, basal metabolic rate, finger and palm prints, number and distribution of sweat glands, galvanic skin resistance, body odor, body temperature, heat and cold tolerance, length of gestation period, male/female birth ratio, frequency of dizygotic twin births, degree of physical maturity at birth, physical maturation rate, rate of development of

alpha (brain) waves in infancy, congenital anomalies, milk intolerance (after childhood), chronic and genetic diseases, resistance to infectious diseases. Modern medicine has recognized the importance of racial differences in many physical characteristics and in susceptibilities to various diseases, chronic disorders, birth defects, and the effective dosage for specific drugs. There are textbooks that deal entirely with the implications of racial differences for medical practice. Forensic pathologists also make extensive use of racial characteristics for identifying skeletal remains, body parts, hair, blood stains, etc.

6. Two of the most recent and important studies of genetic distances and human evolution are: (a) Cavalli-Sforza et al., 1994; (b) Nei & Roychoudhury, 1993. Although these major studies measured genetic distances by slightly different (but highly correlated) quantitative methods based on somewhat different selections of genetic polymorphisms, and they did not include all of the same subpopulations, they are in remarkably close agreement on the genetic distances between the several major clusters that form what are conventionally regarded as the world's major racial groups.

Intelligence and Civilization

by Linda Miller

from Spearhead October, 1995

"Modern comforts," says Linda Miller, "are producing a downbreeding of our population which must be reversed"

'A' level passes this year are at an all-time high. The question being asked in the mainstream media is: Are students doing better or are the tests becoming easier? This question helps to disguise the real issue in the same way as these exam results disguise the same important issue. That issue is the intelligence of the population, and the fact that it is dwindling significantly with each oncoming generation.

Everyone who is honest with themselves has noticed it. Incompetence is rife. If workmen are hired to do a job, all too often it is a botched job. The news is constantly full of examples of wasted public funds; financial calculations made by institutions or companies which have proved inaccurate; (Eurotunnel, Canary Wharf, Lloyds' Names, for example); the shortsightedness of banks making loans to third world countries which will never be able to pay them back, no matter how many rain forests they cut down; and countless other major public fiascos. Teachers and lecturers complain of soaring levels of illiteracy, which cannot all be explained away by misguided and ineffective educational techniques. Each new year, admittance into secondary schools contains many more pupils than the year before who can neither read nor write and who lack basic skills in numeracy.

University lecturers frequently find that they must attempt to teach new students the grounding in subjects which were insufficiently taught at school. The speed of the decay is gathering a rapid momentum.

Intelligence is biological. Knowledge is the acquisition of facts, but intelligence is the biological potential to understand and to learn. There are huge variations in levels of intelligence between individuals within a race and between different races, communities or families. Intelligence is inherited. Because there are many genes involved in determining intelligence, it is a very delicate balance. Usually (not always, due to such factors as recessive genes and mutations) intelligent people have intelligent children and unintelligent people have unintelligent children.

If you wanted to improve the intelligence of the next generation in Britain, you would achieve this if you successfully encouraged intelligent couples to have several children and discouraged unintelligent people from so doing. This positive eugenics would result in a more intelligent

population.

If, on the other hand, the policy were to encourage the intelligent to concentrate on careers at the expense of having children, and to lavish resources on the less intelligent, who as a rule produce the most offspring, this will result in a rapid lowering of the intelligence of the population.

Civilization without a eugenic policy is self-destructive. Civilization could, with the correct eugenic policy, be a great asset to intellectual advancement; but in practice it has always proved to be an implement for the erosion and down breeding of the population.

No Advancement

Almost everyone assumes that because of the progress in technology we have now achieved mankind today has mentally advanced from its intellectual level of a few thousand years ago. It is assumed that we have advanced genetically, but this is not the case. Certainly, the genetic characteristics of our population are continually evolving and changing. Civilization has caused circumstances to arise in which these changes have been happening more rapidly than would otherwise have been the case. These changes have been for the worse. The present-day population is not as intelligent nor as strong of character nor as robust as were the Romans at the time of Cicero over two thousand years ago.

We are right to be proud of the civilization that we have produced. However, throughout all the astounding progress made in science and technology, sociological progress has not kept up with it. Scientific progress is being maintained by a dwindling minority of non-reproducing intelligent people. This rate of advancement is declining and must eventually cease when no more people of sufficient intellectual calibre are being born. There has been no progress at all in government, religion, language or social organisation.

Astonishing as it may seem, civilization can, in itself, be blamed for the lowering of the intelligence of the population.

All civilizations inherently contain the seeds of their own destruction. Only a eugenic policy to safeguard against deterioration can avert this decline. It is vital to recognise the negative aspects of civilization so that we may overcome these problems and develop the first ever civilization which is self-perpetuating. The solution is simple. It is a eugenic programme of improving racial quality.

Civilization saves the misfits. It is a 'humanising' process which sustains and subsidises the weak, the helpless, the morons, the idiots and the inadequates. These elements of the population are a burden carried by the more capable elements.

Without civilization to protect them, the laws of nature -- 'natural selection' -- would have culled these people, instead of saving them to reproduce.

Consequently, the gene pool is flooded with the undesirable elements who breed more prolifically.

Needs of Survival

In civilization there is far less impetus to use one's own intelligence to survive. In primitive society, those who best used their wits, who had energy, who coped best, would survive and live to have children. As a result of this, our ancestors progressed slowly over hundreds of thousands of years. Eventually the population became intelligent enough to form a civilization.

Next, the forces which lead to the evolution of a higher intelligence became reversed.

Civilization is organised to help all members of society, including the stupid, lazy and shiftless. Therefore, these genetic defectives now survived to procreate and perpetuate their own kind, decreasing the level of intelligence in the population. Extensive research has shown that those of lower intelligence, on average, have more offspring than those of high intelligence. The unintelligent are increasing in number, while the intelligent are shrinking. Similarly, physical weaknesses are also spread. This tragic chain of events has doomed every civilization that has ever existed. For some time, even while the decay is setting in, civilization can still advance upward due to the momentum of previous inventions, systems and benefits. Eventually, as the intelligence level drops lower and lower still, the population is no longer able to continue to advance civilization. As the intelligence level decreases further, the ability is lost even to sustain the level which previous generations had achieved. Civilization then begins its downhill slide, and after another few hundred years, it slides into oblivion.

So, we can know this: the population is less biologically intelligent now than in the past. If the teaching techniques and methods of assessing educational achievement remained constant and unchanged, this would be blatantly obvious. It would be demonstrated by a massive failure rate in examinations.

If this was seen to have happened, the population (or, at least, those left with enough intelligence to become alarmed at this rapid decline) would demand that something be done to stop the down-breeding. This is why teaching techniques have been regularly changed, so that the techniques could be blamed for the inability to read, etc. Also, exams have changed. Course work is more significant in assessment than it used to be. Bad spelling is not penalised. Exams have been made easier. There are set quotas of passes which are awarded regardless of performance. The school league tables put pressure on schools to give the impression that they are doing well, with a high pass rate. However, no matter how these superficial factors cause a

lowering of educational standards, we must recognise that the intelligence of the population can only decrease given the pressures of civilization to increase the quantity of unintelligent children born in comparison to intelligent children.

We are caught in a downward spiral that can only be reversed by a policy of good common-sense eugenics.

The Role of Cognition in Evolutionary Theory

By F. J. Irsigler, Paardekraal Hospital, Krugersdorp, Transvaal Mankind Quarterly, 33, 06-01-1993, pp 371.

Lynn (The Mankind Quarterly, XXXII, 1-2, 1991: 116) argues that brain size is positively correlated with intelligence in man, and that races show consistent differences in both brain size and intelligence. Intelligence is understood as the ability to solve cognitive problems. It consists of a conscious (rational) and an unconscious (ratiomorphic) component. The first originates from education, the second from the process of phylogenetic learning (a posteriori) but at the same time is an expectation (a priori) for the ontogenetic gain of knowledge (R. Riedl et al. in Evolution and Cognition 2:58, 1992).

I. The Basic Relation

Evolution is based on the functional relation between ontogeny and phylogeny (Schindewolf, Gould). According to the French molecular biologist F. Jacob, the relation allows to convert a series of organizations in space into an isomorphic series of transformations in time, called "La logique du vivant" (Jacob 1970: 162, 318). In structural terms, the relation is equivalent to autonomous morphogenesis (Monod 1972:26), that is, interpenetration (L. Edinger 1909) or interdigitation (H. Braak 1980) of the phylogenetically old and the new cortices, the allocortex (sensu lato) and the neo-or isocortex. In functional terms, the basic relation refers to the conflict between organism and environment in which the organism "always calls the tune (Jacob: 185). This is due to a cognitive state known as "conscious" or "the conscious self" . It is innate in each species (Sperry 1983: 95) and at the base of the autonomy or self-determination characterizing the living belongs in their behavior (Monod: 79). The latter is related to a specific kind of information from the outside world but does not depend on changes in the environment. This information is called "semantic" (Brillouin) or "teleonomic" (Monod). Professor M. Eigen, the Nobel laureate from the Max-Planck-Institut für biophysikalische Chemie in Göttingen, calls it "Information of selective value with respect to reproduction" (Eigen 1971:517). It provides the "perceived meaning" (Stent) of signs and symbols, also called "the emotional truth" (Cattell). Both are species-typical raising the question how the new evolutionary types or "morphs" originate.

II. Evolution by Law

New species, or subspecific types arise by heteromorph speciation. This means sudden events called "heterochronic", occurring during individual ontogenies and disrupting Haeckel's repetition of phylogeny in ontogeny. This is the tenet of the emerging school holding

"Evolution by Law" or "Nomogenesis" from the Greek *nomos* = law (L. Berg 1922/1969, J.C. Willis 1940, C.P. Groves 1989). Heterochronic "jumps" are explained by G.R. de Beer who states in his "Embryology and Evolution" (1930:108): "New characters apply at all stages of ontogeny, and by heterochony they may be retarded or accelerated, so as to appear later or earlier in subsequent ontogenies". This makes phylogeny a function of ontogeny (A.N. Sewertzoff 1931: 365) and leads to evolutionary progress by phylogenetical branching or cladogenesis (B. Rensch 1971: 122). It is exemplified by the split in the hominid lineage during the Late Pliocene (Tobias 1985:135) and the sudden transposition at the time of emergence of the modern and Neanderthal grade (Groves: 60 ff, 304, 317).

Retarded ontogeny results in retention of ancestral "juvenile characters", formerly called foetalization, now known as "paedo-morphosis/neoteny".

It is the retention of their juvenile bodily traits into adulthood which makes the South African Kalahari Bushmen or San people a distinct ethnic or racial entity (Tobias 1978: 5). The ancestors of the San, living in richly endowed areas, looked exactly like the present-day desert dwellers. This shows that their pedomorphic traits are not, as formerly thought, an effect of adaptation to the arid environment. The homogenetic school considers adaptation to be a conservative rather than progressive factor in evolution. It holds that our species is geologically young and demic (stenotopic) right from the start.

III. Space-time (Dissipative) Structures

Professor I. Prigogine, of the Free University in Bruxelles, has developed a thermo-dynamical theory of evolution which he calls a "Dialogue with Nature". The theory rests on two premises developed in Prigogine's Nobel Lecture in Chemistry (1977). (1) The thermodynamical state "far from equilibrium" which characterizes the living beings, leads, through a series of instability, to a new "order through fluctuations". (2) From the instabilities result, through exchange of matter and energy (information) with the outside world, in space-time structures, called "dissipative" (Prigogine 1977: 2.1, 4.5). The exchange is both necessary and irreversible. Dissipativity thus requires the isomorphism of the basic relation (Section I) to be replaced by heteromorphism leading to heteromorph speciation (Section II). The fluctuations play a decisive role in the evolutionary progress. They amplify some initially small variations into behavior related to the specific "Umwelt" to which the living beings belong. This leads Prigogine to the concept of multiple times (Prigogine et Stengers: 13, 431). The group-specific time is represented in the new "time evolution operator" with its "eigen values". It expresses the condition of dissipativity as a (Lyapounof) function > 0 (Prigogine 1977: 7.6) Dissipativity breaks the time-symmetry of the "Classics" and results, through successive bifurcations, to phylogenetical branching (cladogenesis).

There were earlier attempts to conceive homogenization in terms of a series of deviation-amplifying processes. Professor P. V. Tobias, University of the Witwatersrand, Johannesburg,

refers in his James Arthur lecture on the Evolution of the Human Brain (1969) to Maruyama (1963) and to Holloway (1967) arguing that an initial "kick or push", such as tool-using in Late Pliocene pongids, may have set in motion a positive feedback" resulting in a cladogenetic split (Tobias 1971:144 ff).

The crucial point is the autonomy of the heterochronic (space-time) transformations in which fluctuations, structure, and function are reciprocally interrelated Prigogine 1977: 4.5).

Dissipative structures mediating the contact between organism and the outside world, are present in animals ranging from reptiles to man. They are called "the reptilian-type and palaeo-mammalian-type brains" (Maclean 1978: 42). They comprise the olfacto-striate complex and satellite grisea, the so-called "periventricular brain" involved in hormonal feedback regulation (Nieuwenhuys 1985:179 ff), Laborit's "information circulante". It coincides largely, but not entirely, with the limbic or palaeo-mammalian system which undergoes, in the ascending primates, a definite progression in size and differentiation culminating in man (Stephan and Andy 1970, Stephan 1975). The interdigitation between the phylogenetically old and the new cortices (Section I) results from the migratory processes (Schepers 1948:167) characterizing the early stages of cortex evolution in mammals, that is hemispheric rotation around the lateral (sylvian) fossa, and infolding of the allocortex forming a zone of transition where allocortical and isocortical layers are intimately indented (Braak: 38).

If the connecting pathways between the reptilian and palaeo-mammalian formations are destroyed in monkeys, the species-typical, simian behavior disappears. Interpreting these experimental findings in the light of clinical evidence one might say that these structures "provide the avenues to the basic personality" (Maclean:49).

Clinical evidence is available. In the type of presenile dementia first described by A. Pick in 1898 and bearing his name, "the avenues or connecting regions of the olfactory with the limbic system" are the initial and selective targets of the cortical atrophy in the early stages of Pick's disease. It eventually destroys the human character and conduct ("Kern des Menschseins"). This and the fatal outcome are due to the progressive destruction of the orbito-frontotemporal cortices (Spatz' "basale Rinde") including the allocortical regio entorhinalis and Brodmann's "insula ventralis or olfactoria" (Stephan 1975, Irsigler 1989). (Spatz 1937, 1955, 1965, Luers and Spatz 1957, Kahle 1969, Jacob 1979).

Summarizing. problems arising from space-time contact between organism and environment require structures not related to cognition, but controlled by emotions or "drives". These are components of the "conscious self" ranging from animal consciousness to the self-conscious mind of the human species (Popper and Eccles). The "affective unconscious and the cognitive unconscious" of the Piagetian school (1976) is innate in each species and develops onto- and phylo-genetically at different rates, that is, by heterochronic cytogenesis and myogenesis (Spatz and coworkers). It follows that the Prigoginean "space-time structures" must include al,

cortex sensu lato, represented in mammals by the "periventricular or reptilian-palaeo-mammalian"(cholinergic) brains (MacLean, Niewenhuys). It is thus the subcortex and its connecting path with "basal neocortex" the subcortex and its connecting school, not the surface "association" areas which are at the base of the "distributed" cerebral functioning (Pribram). In other words: the correlation between brain size and function (including intelligence) is one of structural (allo-isocortical) interpenetration and functional reciprocity, not one of sheer quantity in the sense of Jacob's "isomorphism" . The determining factor in both phylogeny and ontogeny is group specificity. In man, this means innate individuality "that effectively rules out environment, experience, or known theory of child development or nurturance" (Sperry 1983: 56).

The heterochronic "jumps" (Phasensprunge, Eigen 1988) characterizing the living beings are related to species-typical information with respect to reproduction. These sudden events replace the time parameter of causation with the quasi-timeless parameter of implication (Hormann, Lestienne) or inductive reasoning (Induktion, Riedl 1980). Heteromorph speciation defines the participation of the species in their own evolution.

Conclusion

In man, brain size is determined by the mass of the neo-cortex. This has led to the idea that the higher cortical functions, including consciousness, are neocortical in origin and character, resulting from the cognitive evolution starting "from scratch" after the break- up of instinct (Piaget 1976). However, consciousness, or the conscious self, is innate in each species, amounting in man to "innate individuality" (Sperry 1983). It is a function of a basic relation (A.N. Whitehead 1949), that is, of the group-specific space-time converting "dissipative" structures present in the brain since the Jurassic mammalian-like reptiles including man. Both the conscious and the unconscious components of cognition are related to the "Umwelt" to which living beings belong, (this is K. Lorenz' "evolutionary epistemology" qualified by I. Prigogine' s "irreversible thermodynamics"). It is the species-typical autonomy characterizing the cognitive (intellectual and emotional dimensions of the human personality) that is responsible for the individual and group differences to which Lynn refers between the sexes and the races.

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Egalitarian Fiction and Collective Fraud

Brief Summary: Social Science researchers have contributed to the myth that there is no difference in intelligence levels among different racial and ethnic groups. Some researchers ignored significant data because it did not fit into the accepted belief of genetic equality.

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[Editors note: the text below was reformatted by the editor after the original formatting was lost]

Social science today condones and perpetuates a great falsehood - one that undergirds much current social policy. This falsehood, or "egalitarian fiction," holds that racial-ethnic groups never differ in average developed intelligence (or, in technical terms, g , the general mental ability factor). While scientists have not yet determined their source, the existence of sometimes large group differences in intelligence is as well-established as any fact in the social sciences. How and why then is this falsehood perpetrated on the public? What part do social scientists themselves play, deliberately or inadvertently, in creating and maintaining it? Are some of them involved in what might be termed "collective fraud?" Intellectual dishonesty among scientists and scholars is, of course, nothing new. But watchdogs of scientific integrity have traditionally focused on dishonesty of individual scientists, while giving little attention to the ways in which collectivities of scientists, each knowingly shaving or shading the truth in small but similar ways, have perpetuated frauds on the scientific community and the public at large. Perhaps none of the individuals involved in the egalitarian fiction could be accused of fraud in the usual sense of the term. Indeed, I would be the first to say that, like other scientists, most of these scholars are generally honest. Yet, their seemingly minor distortions, untruths, evasions, and biases collectively produce and maintain a witting falsehood. Accordingly, my concern here is to explore the social process by which many otherwise honest scholars facilitate, or feel compelled to endorse, a scientific lie.

The Egalitarian Fiction

It is impossible here to review the voluminous evidence showing that racial-ethnic differences in intelligence are the rule rather than the exception (some groups performing better than whites and others worse), and that the well-documented black-white gap is especially striking. All groups span the continuum of intelligence, but some groups contain greater proportions of individuals that are either gifted or dull than others. Three facts regarding these group differences are of particular importance here for together they contradict the claim that there are no meaningful group differences. Racial-ethnic differences in intelligence are real. The large average group differences in mental test scores in the United States do not result from test bias, which is minuscule overall, as even a National Academy of Science panel concluded in 1982. Moreover, intelligence and aptitude tests measure general mental abilities, such as reasoning and problem solving, not merely accumulated bits of knowledge - and thus tap what experts and laymen alike view as "intelligence."

Regardless of how we choose to construe them, differences in intelligence are of great practical importance. Overall they predict performance in school and on the job better than any other single attribute or condition we have been able to measure. Intelligence certainly is not the only factor that affects performance, but higher levels of intelligence greatly increase people's odds of success in many life settings. Group disparities in intelligence are stubborn. Although individuals fluctuate somewhat in intelligence during their lives, differences among groups seem quite stable. The average black-white difference, for example, which appears by age six, has remained at about 18 Stanford-Binet IQ points since it was first measured in large national samples over seventy years ago. It is not clear yet why the disparities among groups are so stubborn - the reasons could be environmental, genetic, or a combination of both - but so far they have resisted attempts to narrow them. Although these facts may seem surprising, most experts on intelligence believe them to be true but few will acknowledge their truth publicly.

Misrepresentation of Expert Opinion

The 1988 book *The IQ Controversy: The Media and Public Policy* by psychologist-lawyer Mark Snyderman and political scientist Stanley Rothman provides strong evidence that the general public receives a highly distorted view of opinion among "IQ experts." In essence, say Snyderman and Rothman, accounts in major national newspapers, newsmagazines, and television reports have painted a portrait of expert opinion that leaves the impression that "the majority of experts in the field believe it is impossible to adequately define intelligence, that intelligence tests do not measure anything that is relevant to life performance, and that they are biased against minorities, primarily blacks and Hispanics, as well as against the poor." However, say the authors, the survey of experts revealed quite the opposite: On the whole, scholars with any expertise in the area of intelligence and intelligence testing ... share a common view of [what constitute] the most important components of intelligence, and are convinced that [intelligence] can be measured with some degree of accuracy. An overwhelming majority also believe that individual genetic inheritance contributes to variations in IQ within the white community, and a smaller majority express the same view about the black-white and

SES [socioeconomic] differences in IQ.

Unfortunately, such wholesale misrepresentation of expert opinion is not limited to the field of intelligence, as Rothman has shown in parallel studies of other policy-related fields such as nuclear energy or environmental cancer research. However, the study of IQ experts revealed something quite surprising. Most experts' private opinions mirrored the conclusions of psychologist Arthur Jensen, whom the media have consistently painted as extreme and marginal for holding precisely those views. As Snyderman and Rothman point out, the experts disclosed their agreement with this "controversial" and putatively marginal position only under cover of anonymity. No one, not even Jensen himself, had any inkling that his views now defined the mainstream of expert belief. Although Jensen regularly received private expressions of agreement, he and others had been, as Snyderman and Rothman note, widely castigated by the expert community for expressing some of those views.

Several decades ago, most experts, among them even Jensen, believed many of the views that the media now wrongly describe as mainstream - for example, that cultural bias accounts for the large black-white differences in mental test scores. While the private consensus among IQ experts has shifted to meet Jensen's "controversial" views, the public impression of their views has not moved at all. Indeed, the now-refuted claim that tests are hopelessly biased is treated as a truism in public life today. The shift in private, if not public, beliefs among IQ experts is undoubtedly a response to the overwhelming weight of evidence which has accumulated in recent decades on the reality and practical importance of racial-ethnic differences in intelligence. This shift is by all indications a begrudging one, and certainly no flight into "racism."

Snyderman and Rothman found that as many IQ experts as journalists and science editors (two out of three) agreed with the statement that "strong affirmative action measures should be used in hiring to assure black representation." Fully 63 percent of the IQ experts described themselves as liberal politically, 17 percent as middle of the road, and 20 percent as conservative - not much different than the results for journalists (respectively, 64, 21, and 16 percent). Moreover, as Snyderman and Rothman suggest (and as is consistent with personal accounts by Jensen and others), many of the surveyed experts, while agreeing with Jensen's conclusions, may disapprove of his expressing these conclusions openly. Consistent with this, when queried about their respect for the work of fourteen individuals who have written about intelligence or intelligence testing, the IQ experts rated Jensen only above the widely but apparently unjustly vilified Cyril Burt. Despite the fact that most agreed with Jensen, they rated him far lower than often like-minded psychometricians who had generally stayed clear of the fray. Jensen even received significantly lower ratings than his vocal critics, such as psychologist Leon Kamin, whose scientific views are marginal by the experts' own conclusions. By contrast, the experts in environmental cancer research behaved as one would expect; they gave higher reputational ratings to peers who are closer to the mainstream than to high-profile critics. Snyderman's and Rothman's findings therefore suggest that a high proportion of experts are

misrepresenting their beliefs or are keeping silent in the face of a public falsehood. It is no wonder that the public remains misinformed on this issue.

Living Within a Lie

IQ experts feel enormous pressure to "live within a lie," to use a phrase by Czech writer and leader Vaclav Havel characterizing daily life under communist rule in Eastern Europe. Havel argued, in *The Power of the Powerless*, that, by living a lie, ordinary citizens were complicit in their own tyranny. Every greengrocer, every clerk who agreed to display official slogans not reflecting his own beliefs, or who voted in elections known to be farcical, or who feigned agreement at political meetings, normalized falsification and tightened the regime's grip on thought. Each individual who lived the lie, who capitulated to "ideological pseudo-reality," became a petty instrument of the regime. As many commentators have noted, Americans may not speak certain truths about racial matters today. To adapt a phrase, there is a "structured silence."

Social scientists had already begun subordinating scientific norms to political preferences and creating much of our current pseudo-reality on race by the mid-1960s. Sociologist Eleanor Wolf, in a 1972 article in *Race*, for example, detailed her distress at how fellow social scientists were misusing research data to support particular positions on civil rights policy: presenting inconclusive data as if it were decisive; lacking candor about "touchy" subjects (such as the undesirable behavior of lower-class students); blurring or shaping definitions (segregation, discrimination, racism) to suit "propagandistic" purposes; making exaggerated claims about the success of favored policies (compensatory education and school integration) while minimizing or ignoring contrary evidence. As a result, social science and social policy are now dominated by the theory that discrimination accounts for all racial disparities in achievements and well-being. This theory collapses, however, if deprived of the egalitarian fiction, as does the credibility of much current social policy. Neither could survive intact if their central premise were scrutinized.

No wonder, then, that IQ researchers find themselves under great professional and institutional pressure to avoid not only engaging in such scrutiny but even appearing to countenance it. The scrutiny itself must be discredited; the egalitarian fiction must be raised above serious scientific question. Scientists must at least appear to believe the dogma. As was the case in Havel's communist-dominated Eastern Europe, in American academe feigned belief in the official version of reality is maintained largely by routine obeisance of academics as they pursue their own ambitions.

Scholars realize their scholarly ambitions primarily through other scholars. Peer recognition is the currency of academic and scientific life. It is crucial to a scholarly reputation and all the steps toward status and success - publications, professional invitations and awards, promotion, tenure, grants, fellowships, election to professional office, appointment to prestigious panels.

One's ability even to carry out certain kinds of research, funded or not, may be contingent upon peer recognition and respect - for instance, getting collaborators, subjects, or cooperation from potential research sites. Just as in personal life, a high professional reputation depends upon a sustained history of "appropriate" behavior, and it may be irreparably damaged by hints of scandal or impropriety. Similarly, the reputations of scientists and their organizations are enhanced or degraded by those for whom they show regard and approval. Associating oneself with highly regarded individuals or ideas enhances, even if slightly, one's own status.

Awarding an honor to a luminary can enhance the reputation of one's own organization, especially if the recipient accepts the honor with genuine appreciation. By the same token, one risks "staining" one's reputation by associating with, honoring, defending, or even failing to condemn the "wrong" sort of individual or idea. In short, how one gives or withholds one's regard is important for one's professional reputation because it affects the regard one receives. Such a social system enhances the integrity of science and is furthered by personal ambition when the members of the community base their regard on scholarly norms, such as competence, creativity, and intellectual rigor. However, such a system breeds intellectual corruption when members systematically subordinate scientific norms to other considerations - money, politics, religion, fear. This is what appears to be happening today in the social sciences on matters of race and intelligence. As sociologist Robert Gordon argues, social science has become "one-party science."

Democrat or Republican, liberal or conservative, virtually all American intellectuals publicly adhere to, if not espouse, the egalitarian fiction. And many demonstrate their party loyalty by enforcing the fiction in myriad small ways in their academic routine, say, by off-handedly dismissing racial differences in intelligence as "a racist claim, of course," criticizing authors for "blaming the victim," or discouraging students and colleagues from doing "sensitive" research. One can feel the gradient of collective alarm and disapproval like a deepening chill as one approaches the forbidden area. Researchers who cross the line occasionally face overt censorship, or calls for it. For example, one prominent (neoconservative) editor rejected an author's paper, despite finding it scientifically sound, because there are social "considerations" which "overweigh the claims of social science." Another eminent editor, after asking an author to soften the discussion in his article, recently published the revised paper with an editorial postscript admonishing scientists in the field to find a "balance" between the need for free exchange of research results on intelligence and the (presumably comparable) "need" that "no segment of our society. . .feel threatened" by it.

Covert and Overt Censorship

Whether motivated by a sincere concern over supposedly "dangerous" ideas or by a desire to distance themselves publicly from unpopular ideas, editors who use such non-academic standards discourage candor and stifle debate. They deaden social science by choking off one source of the genuine differences of opinion that are its lifeblood. Overt censorship of research

is uncommon, probably because it is an obvious affront to academic norms. Less striking forms of censorship directly affect many more academics, however, and so may be more important. Easier to practice without detection and to disguise as "academic judgment," they serve to keep scholars from pursuing ideas that might undermine the egalitarian dogma.

A less obvious form of censorship, which has become somewhat common recently, is indirect censorship. It is accomplished when academic or scientific organizations approve some views but repudiate or burden others on ideological grounds. Sometimes the ideological grounds are explicit. Campus speech codes are a well-known example which, had they been upheld in the courts, would have made repudiation of the egalitarian fiction a punishable offense on some campuses. The earlier (unsuccessful) attempt to include possible "offense to minority communities" as grounds for refusing human subjects approval is another example.

Gordon reports yet others, including the National Institutes of Health's new extra layer of review for politically "sensitive" grant proposals and the University of Delaware's recent policy (reversed by a national arbitrator) of banning a particular funding source because, so the university claimed, it supports research on race which "conflicts with the university's mission to promote racial and cultural diversity." Gordon also outlines in detail - as political scientist Jan Blits has done - the covert application of ideological standards to facilitate expression of some views but burden others. This form of indirect censorship, also falling under the rubric of "political correctness," occurs when university administrators, faculty, or officers of professional associations disguise as "professional judgment" an ideological bias in their enforcing of organizational rules, extending faculty privileges, protecting faculty rights, and weighing evidence in faculty promotions and grievances.

Recently, some American universities have invoked "professional judgment" as a pretext for reclassifying "controversial" scholarly publications in their annual merit reviews as "non-research," to misrepresent outside peer reviews in evaluating controversial professionals up for promotion, and to limit student access to these professors. Such thinly veiled bias publicly demonstrates the officials' own adherence to the prescribed institutional attitudes and their willingness to enforce them, not only protecting those officials from protest but also encouraging fellow members of the institution to toe the line.

Covert censorship is far more common than overt or indirect censorship. It consists of bias in the application of scientific norms when reviewers evaluate their peers' work for funding, publication, presentation, or dissemination. Individual ideological biases are found in all fields, of course, but the hope is that such biases remain small and will cancel each other out over the long run-hence the importance of a free and open exchange of data, theories, and results. What I have in mind is systematic bias and a pervasive double standard which impedes one line of research and accords another undeserved hegemony. In one-party science, the disfavored line of work is subjected to intense scrutiny and nearly impossible standards, while the favored line of work is held to lax standards in which flaws are overlooked (called "oversight bias" in the

psychological literature). Similarly, the disfavored idea is rejected unless it is "balanced" by including proponents of the favored view (even if that view is the equivalent of "flat-earth theory"), where the favored line of work is readily accepted for publication or presentation, even when it totally ignores the opposing literature. Getting a controversial paper accepted under such circumstances often becomes a test of endurance between the editor and reviewers (in coming up with criticisms) and the author (in rebutting them). Submitting IQ research or grant proposals outside the narrowest professional confines exposes intelligence researchers to yet other biases, usually of the kind to which reviewers of the proposals will accept no rebuttal.

The broader circle of critics in the social sciences often implicitly dismisses the legitimacy of research on intelligence itself by arguing that "intelligence" is undefinable or unmeasurable - as if the critics' own favored constructs (social class, culture, self-concept, anxiety, and so on) were as well validated and operationalized. Others now also seek to deny IQ researchers (but not themselves) use of the concept "race" because, they assert, race is not a biological condition, but is socially constructed. The double standards can even ricochet back and forth, depending on the particular question being considered. Gordon recalls how sociologists failed to criticize sociologist James Coleman for omitting student ability from his analyses of school integration (which led to overstating the impact of integrated schools on black achievement-for sociologists a favorable outcome), but how they criticized him roundly for the very same omission in analyses of private versus public schools,(which led to overstating the impact of private schools on black achievement - an unfavorable outcome). In short, in one-party science, scientific regard flows like political patronage to loyal and active party members, who can demonstrate their loyalty by being alert to hints of dissidence. Like all one-party political systems, one-party science becomes intellectually corrupt and arrogant as it gains confidence in its power.

The most insidious corruption to which one-party science leads is pervasive self-censorship, what involved researchers generally prefer to regard as "prudence" or "avoiding unnecessary trouble." Coleman has drawn particular attention to the problem of "self-suppression "the impulse not to ask the crucial question" - in research on race. In an example from his own research for the influential "Coleman Report," he describes his failure to conduct important analyses that might have produced embarrassing findings about the abilities of black teachers. Another way of avoiding unwanted results is to ignore certain data, subjects, or variables. Or unwanted results can be omitted, buried in footnotes, explained away, or simply ignored in one's conclusions. The most subtle form of self-censorship is deliberate avoidance of making crucial connections, or denying them. Psychologist Richard Herrnstein has noted that it was his drawing out the implications of one such connection, namely, that some portion of (white) social class differences in intelligence is genetic, that sparked his public excoriation in the 1970s.

Normally, scholars are eager to explicate illuminating connections between subspecialties. They are reluctant to do so, however, when these connections put in question the egalitarian dogma on race. Virtually all sociologists and economists ignore the literature on intelligence despite its

central importance to core issues in their disciplines, such as inequalities in occupation and income. Researchers in the various subfields of intelligence obviously cannot ignore the literature with impunity. Yet they, too, often prefer to stay strictly within the confines of their specialties rather than making crucial, but unpopular, connections, or they use language that obscures what otherwise would be quite obvious.

Many psychometricians, especially those working for large testing organizations, avoid referring to "intelligence" and often seem reluctant to say much about the practical or theoretical meaning of the racial differences they observe on unbiased tests. But even remaining within one's subfield is often not enough, for the field of intelligence itself is widely suspect. Hence some scholars explicitly disavow unpopular connections that critics might attribute to them. For example, they will argue in favor of the importance of intelligence for scholastic performance but then assure their readers, over-optimistically, that the racial gap "seems to be closing rapidly." The tenor of these preemptive disclaimers is clear. While researchers in any field may lightly dismiss the credibility of key connections regarding race and intelligence, no one ever lightly endorses their credibility with impunity. Even those of us committed to candor are exceedingly cautious when expressing informed opinions on certain topics, especially the genetics of race. Thus, publicly stated opinions of researchers about matters outside their subfields tend in one direction - to dispute or undercut the facts necessary for toppling the egalitarian fiction. What may be tolerable behavior at the individual level becomes intolerable bias at the aggregate level. Censorship - even self-censorship - requires justification, or at least apparent justification.

On the whole, those who would squelch open inquiry of the egalitarian fiction base their justification on two assertions: 1) Research on racial differences in intelligence has already been scientifically "discredited." 2) Inquiry into racial differences is immoral.

Point one asserts that the egalitarian premise is absolute truth and hence beyond scientific scrutiny. Point two is indifferent to its truth. Both counsel outrage at the very thought of the research. The claim that the research has been discredited rests largely on extensive misrepresentation that is often embarrassingly crude or casual - for example, contradicting arguments an author never made, while ignoring what was actually stated; attributing policy preferences to an author which are opposite of what the author actually expressed; or simply alleging fraud or gross incompetence without any substantiation whatsoever. The claim that the research is immoral rests squarely on the view that, regardless of the truth, the study itself can only be harmful. In fact, some critics assert (mostly privately) that the greater the truth, the greater the danger it poses to lower-scoring groups, and thus the greater the need to suppress it.

Despite their differences, both justifications for censorship often take the form of demonizing open inquiry by labeling it (and the people who practice it) as "dangerous," "fascist," "ideological," or "racist." The study of race and intelligence is something, they tell us, that no decent person - let alone a serious scientist - would ever do and that every decent person and

serious researcher would oppose. Thus, in a kind of Orwellian inversion, marked by what Gordon calls "high talk and low blows," the suppression of science presents itself as science itself. Intellectual dishonesty becomes the handmaiden of social conscience, and ideology is declared knowledge while knowledge is dismissed as mere ideology. Neither social policy, nor science, nor society itself is served well by scientific silence on racial differences in intelligence.

Enforcement of the egalitarian fiction has tragic consequences, especially for blacks. The outcomes are even worse than researchers of intelligence predicted two decades ago. The falsehood, because it tries to defy a reality that has conspicuous repercussions in daily life, is doing precisely what it was meant to avoid: producing pejorative racial stereotypes, fostering racial tensions, stripping members of lower-scoring groups of their dignity and incentives to achieve, and creating permanent social inequalities between the races. Enforcement of the lie is gradually distorting and degrading all institutions and processes where intelligence is at least somewhat important (which is practically everywhere) but especially where it is most important (in public schools, higher education, the professions, and high-level executive work). The falsehood requires that there be racial preferences and that their use be disguised, wherever intelligence has at least moderate importance. Society is thus being shaped to meet the dictates of a collective fraud. The fiction is aiding and abetting bigots to a far greater degree than any truth ever could, because its specific side-effects - racial preferences, official mendacity, free-wielding accusations of racism, and falling standards - are creating deep cynicism and broad resentment against minorities, blacks in particular, among the citizenry.

Enforcement of the egalitarian fiction is not a moral or scientific imperative; it is merely political. It is terribly short-sighted, for it corrupts both science and society. However, just as the fiction is sustained by small untruths, so can it be broken down by many small acts of scientific integrity. This requires no particular heroism. All that is required is for scientists to act like scientists-to demand, clearly and consistently, respect for truth and for free inquiry in their own settings, and to resist the temptation to win easy approval by endorsing a comfortable lie.

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Cranial Capacity and IQ

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As was the case in much of his other research, Sir Francis Galton (1888) was the first to report a quantitative relationship between human cranial capacity and mental ability. Galton's subjects were 1095 Cambridge undergraduates. The statistical techniques available to him in 1888 did not include Pearson's correlation coefficient nor an objective Binet-type measure of intelligence. Galton computed head capacity simply by multiplying head length by breadth by height. No adjustment was made for thickness of the skull. Mental ability was estimated from average college marks. He found the relationship to be low and insignificant. Years later when Galton's 1888 data were reworked the correlation between head capacity and college marks was found to be in the range of r s reported by Pearson (1902, 1906, 1926), Pearl (1906) and many others.

From Galton's early paper to Lynn's series of studies in 1989-1990 there were at least 38 published investigations of the relationship of human head measurements to mental ability but only about one in four used cranial capacity as a head measurement despite the fact that in 1901 Dr. Alice Lee had developed a formula for determining cranial capacity which corrected for thickness of the skull. In the present study, which correlates mental ability with head capacity, Lee's formula was applied to head measurements of 476 subjects from the Georgia Twin Study (Osborne 1980). At the suggestion of Richard Lynn (personal communication) two additional correlations were computed, mental ability r s. head circumference and mental ability vs. cranial capacity with height and weight controlled.

The Georgia Twin Study database contains 127 measures of physical, mental and personal characteristics for 238 pairs of twins. In this analysis only the following variables will be used; age, race, sex, height, weight, head length, head width, head circumference, and IQ obtained from the average of the twelve mental tests of the Basic Battery of the twin study. The 476 subjects ranged in age from 12 to 18 but 2 subjects age 12 were placed in the 13-year-old group and 26 age 18 were combined with 70 subjects age 17 to yield a total of 96 for the oldest age group. There were 100 subjects age 16, 96 age 15, 116 age 14, and 68 in the 13-year-old group, including the two 12-year-olds who were assigned to the group. Of the 476 subjects 106 were white males, 84 black males, 118 white females and 168 black females. It should be mentioned here that in the total group of 476 subjects there are 50 pairs of unlike-sexed twins. For this reason the number of subjects in an age-sex analysis does not always yield an even number as would be the case if all the twins were like-sexed. For example, there are five subjects in the 13-year group of white males. At least one of these subjects has his twin in the white female group. In addition to the 50 pairs of unlike sexed twins, 20 pairs of white males were DZ, 21 MZ; 11 pairs of black males were DZ, 18 MZ. Of the white females 21 pairs were DZ, 26 MZ. Twenty eight pairs of black females were DZ, 43 MZ. The complete break-down by age, race and sex is

given in Table 1.

Head capacity was determined by Lee's formula which requires head height. Since this measure was not one of the 127 twin-study variables, head height was estimated from a table prepared by Berry and Porteus (1920) and reproduced by Penrose as Appendix 2 (Penrose 1963).

From Table 1 it is seen that in the first phase of the analysis correlations were computed by age, for four race-sex groups. Because of the small numbers in some of the categories little credence can be placed in the r s. However, the correlations for the total race-sex groups compare favorably with recent studies of head measurements as they relate to mental ability. Among the mostly positive r s the insignificant and even negative r s at the 16-year level stand out. These subjects are all age 16; this is not a collapsed age bracket as we have at ages 13 and 17. The 16-year-old white males, black males and black females show this deviation in r s from adjacent ages. All the correlations in the table for white females are positive and compare favorably with the total r s by sex. Since the subjects' ages were not determined until after the tests were administered there is no way some 16-year-olds could have been singled out for special or different treatment from 15-year-olds or 17-year-olds. In the case of black males the small number of cases might have been a factor but not in the case of black females nor white. Since Galton's 1888 study there have been at least 21 published studies examining the quantitative relationship between head measurements and mental ability. The first significant correlational study was Pearson's 1902 Royal Society paper, which he published again in 1926 in *Annals of Eugenics*. Results of studies before 1902 for the most part here reported as differences in means.

There has been little agreement among investigators as to which cranial measurements yielded the best estimate of cranial capacity. They varied from simple head width to brain weight/spinal cord weight ratio. Head circumference was the most frequently used head measurement. Correlations ranged from .02 in one of Lynn's studies (1989) to .41 (Wienberg 1974). Cephalic index consistently produced a very low or negative correlation with mental ability. Galton estimated cranial capacity by multiplying head length by head height by head breadth but he had no method of estimating the relationship between the variables except to show mean differences. Since Galton's Cambridge study numerous other investigators have used cranial capacity to compute head measurements-mental ability correlations. The range of r s for these studies was from .08 (Reed, 1923) to .14 (Passingham 1979).

In Table 1 correlations between head capacity and mental ability and head circumference and IQ are shown by age for four different sex-race groups and for the total group by sex. Also given for the five groups are the r s between IQ and head capacity with height and weight partialled out. From the table a trend of consistent age differences in correlations is not apparent unless it would be that of the white females who show slightly decreasing r s with increasing age. When only total groups are considered; i.e., all white males, black males, white females and black females, the r s between IQ and head capacity are higher than any reported in the

literature. When the two races are compared, rs for females are significantly higher than those for males. The pattern does not hold when comparing total group rs for head circumference and IQ. Black males rs > than black females and white females rs > than white males. As would be expected when partial r's are computed between head capacity and IQ with height and weight partialled out the rs are attenuated when compared with those between head capacity and IQ alone.

While the database for this study was the 238 sets of twins from the Georgia Twin Study (Osborne 1980) intraclass correlations or other twin statistics were not computed. Each member of a twin pair was treated as an individual for our analysis. Positive correlations were found between head size as measured by head capacity and IQ and by head circumference and IQ. The rs were significant when the subjects were grouped by race and by sex. When the subjects were analyzed by age, race and sex the groups were too small to yield a pattern of meaningful correlations.

This article supports the recent studies of Lynn (1989, 1990) and Broman (1987) which found a positive association between human head size and intelligence. Lynn interprets this finding as an explanation for the rapid evolution of brain size in hominids during the last 2 million years. Our finding that head capacity-IQ correlations rs hold up equally for males and females and for both blacks and whites is the unique contribution of this paper.

TABLE 1

Correlations between Mental Ability, Head Capacity and Head Circumference by Age, Race and Sex
Correlation between IQ and AGE Number Head Measurements

(a.) (b.) (c.)

White Males 135.451-.072-.345

1425.334.112.371

1523.150.351.144

1626.042.113-.033

1727.162.042.208

Total 106.278.161.217

Black Males 1320.106.228.071

1429.319-.030.398

1512.211.536.323

1612-.252.137-.299

1711.396.646.811

Total84.296.340.250

White Females1311.716.632.484

1423.312.311.286

1523.340.295.366

1630.237.356.286

1731.167.015.122

Total118.387.231.367

Black Females1332.045-.245.086

1439.509.496.555

1538.417.261.369

1632.061-.051-.003

1727.521.236.292

Total168.325.126.307

Total Group By Sex

Male190.447.163.300

Female286.295.019.292

(a.) Pearson r (IQ vs. Head Capacity)

(b.) Pearson r (IQ vs. Head Circumference)

(c.) Partial r s (IQ vs. Head Capacity) Ht. and Wgt. partialled out.

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Concerning Scientific Creativity: Hermann J. Muller and Germinal Repositories

By J. W. Jamieson, Institute for the Study of Man, Washington D.C. Vol. 33, Mankind Quarterly, 06-01-1993,pp

All life forms have acquired their present characteristics by descent from individuals who survived previous environmental hazards and successfully produced offspring. But if fitness to survive in a prevailing ecological niche leads, as it so often does, to extreme adaptation to a specific set of conditions this may itself lead to the extinction of the species in the event that the environment changes drastically and too rapidly to permit the further evolutionary adaptation necessitated by the new environment. Thus, while passive evolutionary adaptation to a myriad of environmental niches has created a rich biological kaleidoscope of diverse fauna and flora, evolution has also taken a second direction among the more advanced life forms, with mankind as the prime example of this latter class. This second class does not rely entirely upon passive adaptation to prevailing environmental circumstances; its members have developed complex nervous systems which enhance their survival chances by facilitating suitably varied responses to unexpected changes in the environment.

Among unicellular life forms, for example, phototropism is an elementary form of survival-oriented response to changes in the environment. Among higher life forms, and particularly birds and mammals, this variability to respond to environmental challenges has led to the development of what we call "intelligence." Psychologists have proposed various narrow definitions of intelligence narrow because they are trying to define what it is that "intelligence tests" actually test. Generally, psychologists agree that intelligence involves the speed with which a living organism is able to effectively analyze data provided to it by its sensory organs. But to examine the concept of intelligence in a broader, evolutionary-related sense (while not contradicting the cautious definitions of psychologists) we may depict the evolutionary explanation for the appearance of intelligence in terms of the role that intelligence plays in facilitating survival among the more complex life forms that grace the world today.

Intelligence in an evolutionary context is the ability to analyze data about the surrounding environment, relate this to the past experience of the organism (and perhaps even of the species), and to promote reactive behavior which will promote the survival chances of the organism or its progeny, possibly also other members of its group. Intelligence is of particular utility in the case of mobile animals whose environment is likely to offer frequent and often sudden threats to survival. Most such animals have also evolved "built-in" reactions, such as alertness to unexpected noises or movements, but intelligence can lead them to react in far more sophisticated ways, including devising tools to assist in securing nourishment or protecting themselves and their offspring.[1]

Modern man in contemporary technologically-advanced societies, alone among all the forms of life currently known to exist in the universe, has become particularly dependent upon intelligence for survival. Proto-humans early specialized at the primate level in the use of intelligence to achieve survival above all other qualities (other than the need to develop resistance to disease common to all complex life forms). As a species, hominids have moved away from prime dependence upon physical adaptations such as powerful jaws and fangs, arboreal nimbleness, athletic ability, muscular and skeletal strength, etc. , to ensure survival, even though we still prize physical abilities such as these in certain occupations and in our recreations, e.g. boxing, athletics and ball games. Physical prowess still gives us joy and pleasure, but what we depend upon increasingly for survival is our ability to problem-solve. Over a million or more years our ancestors evolved a more powerful brain, as evidenced by the palaeontological research. Probably with especial speed during the past fifty or so millennia, human intelligence advanced to reach its present varied levels. The peak may actually have been attained by some human populations as much as 35,000 years ago (e.g. the Cro-Magnons of Western Eurasia), certainly by four or five thousand years ago (as, for example, in ancient Sumeria or ancient Greece), but the distribution of intelligence is still not uniform around the world today, either between races, or even within races. But it is important to remember that evolution is not a one-way street. Evolutionary advancement is not inevitable. Devolution can occur within populations, and when it does, this is likely to lead to their ultimate extinction. No sub-species or species is guaranteed survival in the evolutionary sweepstake. Although our modern technology-based civilization depends on high intelligence and high creativity, there is no guarantee that our breeding trends and now culturally-influenced selective forces will ensure the survival of a sufficient number of highly intelligent and creative individuals into future populations to preserve, let alone advance, our present culture.

Eugenics

Eugenics is a modern ideal, developed only a hundred years or so ago, which has become a reality in modern medicine as medical science traces so many diseases, and the ability to resist diseases, to genetic factors. The predominantly genetic basis of intelligence is now widely accepted,[2] despite opposition from some who are dedicated to egalitarian values and who profess their belief in the absurd notion of the biological equality of individuals and races. Only identical twins can be biologically equal in their propensities.

To the extent that some societies have benefited from a high proportion of intelligent and creative individuals among their ancestors, advanced cultures have risen in different parts of the world at different times, and those of today have become totally dependent on high intelligence and technological sophistication. Thus, some of the inhabitants of our modern Western cities, whose forebears were quite capable of hunting animals, hoeing fields, picking crops and other simple levels of agrarian activity, now have difficulty in achieving subsistence because their intelligence level is inadequate for the demands of the technologically advanced economy on which our society depends.

In consequence, many conscientious scholars have come to favor the introduction of some form of eugenic measure to ensure that future generations will be endowed with adequate intelligence and creativity to maintain, or possibly even advance, our present level of technologically-based subsistence. Some have argued that we need to devise ways and means of discouraging high rates of reproduction-among those of unduly low intelligence. We have no argument with those who hold this position, provided only that it be achieved by painless and not degrading inducements and is not forcibly imposed. The renowned Professor William Shockley, Nobel prizewinner and co-inventor of the transistor, suggested as a thinking exercise that financial inducements might be offered to those of very low IQ, who were unable or barely able to look after themselves, to voluntarily choose to be sterilized so that they could indulge their desire for sex without burdening the rest of the population with the need to care for their offspring -- who with statistical certainty would most likely be of similarly low intelligence.[3]

Then there are others, like Dr. William Andrews, a frequent contributor to this journal, who argue that we should seek humane ways of raising the average intelligence level of the entire population - including that of all the diverse ethnic groups within our multiethnic society, so that the disparities between the intelligence of the diverse ethnic groups should not be accentuated beyond the already embarrassing levels of inequality. This he sees as a necessity for the basic maintenance of civilization as it presently stands. We would not choose to argue with him either.

By contrast, however, we firmly believe that Mankind faces an even more serious need. As science and technology continue to advance, the level of intelligence needed to become a competent scientist and to maintain a technologically-sophisticated society is steadily rising. So also is the need for creative people- people of high intelligence who also have the ability to innovate. We must therefore be prepared to develop inducements to ensure that future generations will continue to produce a high enough ratio of truly intelligent and truly creative individuals if posterity is to be able to continue the further march of science. And Mankind will surely need further scientific research to solve the problems of environmental deterioration that it has created, and to meet the other problems, including health threats, which are rapidly becoming more acute as a result of the ongoing population explosion originating in the Third World.

In short, we believe that greater consideration must be given not merely to the need to dissuade those of abnormally low intelligence from reproducing, and not merely to efforts to protect the overall level of human intelligence among the diverse ethnic groups and populations that make up Mankind, but to the need to ensure an adequate rate of reproduction among those who are especially gifted.

Creativity

True creativity is not evenly equated to intelligence. As Berkeley Professor Arthur R. Jensen has pointed out:

. . . one should never equate IQ with genius. Very few high-IQ persons ever become geniuses in the genuine sense of making contributions recognized by the intellectual, scientific, and artistic world as extraordinarily outstanding. Yet most of the world's geniuses come from the upper part of the IQ distribution, virtually without exception.

Superior intelligence is a necessary but far from sufficient condition for extraordinary intellectual achievement. The concept of "genius" has no authentic meaning except in terms of achievement. Shakespeare's genius is in his plays. Beethoven's genius is in his symphonies.

One often hears unfounded claims about "low" IQs of persons with extraordinary [intellectual, scientific or cultural] accomplishments . . . But the claims are sheer nonsense. Whenever such persons have been tested, they are never found to have low IQs; they almost never score average IQs; by far the most of them score above the top 1 or 2 percent of the general population.[4]

True creativity - bringing into being something which has not previously existed - is the attribute of Mankind in which we most resemble the Creator himself. If we do not fully understand this very special faculty, at least we can recognize it when it manifests itself. It will be useful to cite some examples of true scientific creativity and the ways in which it has greatly lengthened and enriched our lives.

Creativity and Science: The Contribution of Caucasoids and Mongoloids

Consider how much Mankind owes to truly creative people, to geniuses. Creativity gave us lenses of power. These were probably first produced by Meissner. With the lenses in Galileo's telescope the science of astronomy was born. This replaced the old concept of Earth as the center of the universe.

In recent times Caucasoid Westerners have transformed the world. They have freed Man from slow transportation by horse and sail by producing first the railroad, then the powered ship, and then the automobile, the airplane, and more recently space craft. They have provided an understanding of evolution (Darwin) and an understanding of genetics (Mendel; Watson). Westerners have developed health science, lowered the death rate, doubled life expectancy and trebled the population of the world. They have produced one of the most creative periods in human history.

For microscopes we owe thanks to Janssen. Later, under Van Leuwenhoek, they revealed the existence of germs. This began the science of bacteriology, leading to subsequent control of infections, including cholera, typhus, bubonic plague and yellow fever. To this conquest Pasteur contributed significantly. Jenner freed us from smallpox and founded immunology. With

Fleming and his penicillin we began antibiotic control of bacterial disease. With Salk we began the conquest of polio.

For almost 500 years our society has replaced the conjectures of the ancients with controlled experiments so as to determine reality. Francis Bacon inaugurated this scientific method.

We profit from Newton's understanding of gravity as a basic force in the universe. Einstein contributed significant refinement to this understanding, especially as applied to vast distances and enormous masses.

Gutenberg gave us movable type and the printing of books. Watt's steam engine began the industrial revolution. This development changed the face of our world more drastically than any other activity since the introduction of agriculture.

Benz gave us the automobile.

Marconi gave us radio. DeForest gave us triode tube electronics. Then Shockley's junction transistor powered the whole silicon valley development and its electronic marvels: computers, (v. Bush), television (Zworykin), radar (Watson-Watt).

Nuclear reaction -- elemental transmutation -- began with Rutherford and led to nuclear fission (Hahn) and to nuclear fusion (Cockcroft and Walton).

The Wright brothers originated heavier-than-air flight.

There were others: Faraday, inventor of the original electric generator; Henry, inventor of the electric motor; and Edison, inventor of the incandescent light.

Bell gave us the telephone; Lenoir gave us the internal combustion engine; Whittle the jet. Goddard and his rockets led to escape from earth's gravity and to interstellar flight. There are other examples by the hundreds: the bicycle, sewing machine, typewriter, portland cement and reinforced concrete, motion pictures, propellers, friction matches, the reaper, photography, vulcanized rubber, elevators, dynamite, X-rays. Each had its own identified creator.

One could continue in awe to list the multitude of technical accomplishments created by Western civilization. Indeed, science and its technology are the glory of our civilization.

No matter how incomplete this list or imperfect its attributions, as one studies this outpouring of scientific creativity a remarkable correlation appears: it is remarkable that every one of these creative individuals mentioned above is or was a Europoid Caucasoid. Although not exclusively linked to Europoids, throughout history, creativity has been primarily found among Caucasoids

and, to a somewhat lesser extent, among those East Asians known broadly as Mongoloids. The capacity to create is a rare gift and unfortunately it is not universal.[5]

Because -- in part at least -- of outmigration and genetic admixture, creativity has not been exclusively linked to Europoids or Mongoloids. It is not solely a "Western" or East Asian phenomenon. But it has been almost exclusively linked to the Europoid and Mongoloid peoples or their migrant descendants. Some of the latter are itemized below. Though these comprise a respectable number, their total would appear to stand in striking contrast to the thousands of Europoid creators of Caucasoid civilization from the first appearance of the Upper Paleolithic culture of Europe -much of which was eventually transmitted across the Asian steppe-lands to be picked up and adapted by Mongoloids, with some reverse flow of East Eurasian invention to West Eurasia. [6] Even the culture of the intelligent Mongoloid Eskimos originated among the Cro-Magnons and their Europoid descendants in Western Eurasia during the Upper Paleolithic and Mesolithic periods.

The Mongoloid Chinese and Japanese civilizations are well known to have achieved high levels of technology and refinement. The Chinese invented gunpowder, printing, and a diverse variety of things including even the wheelbarrow. The Mongoloid Japanese are today showing us their technological ability to copy and then to innovate and improve. The Caucasoid West seems now be suffering from centuries of dysgenic behavior, in which the leadership elements have been destroyed in bloody revolutions, overseas adventures and internecine wars (e.g. the French revolution, the Russian revolution, and the selectively dysgenic impact of World Wars I and II, probably unparalleled in the history of man for their disastrous genetic impact on the participant nations. Indeed, dysgenics and the concomitant decline of creativity in the West has recently become so pronounced that, what with disparate labor costs, political and financial mismanagement, with commercial espionage, and ideological confusion weakening the still predominantly Caucasoid West, the more purely Mongoloid of the East Asian countries are today rapidly overtaking the weakened (and increasingly hybridized) Caucasoid stock in many areas of creativity.

But as we have already observed, because of the former triumphant outward migration by the descendants of the Cro-Magnons, from the Mesolithic onwards, Middle Easterners and a high proportion of South Asians are either exclusively or primarily Caucasoid in their ancestry. [7] Classical Greek and Roman Europoid civilizations were clearly Caucasoid, direct descendants of the fabulously creative Cro-Magnon Caucasoids. But the ancient Mesopotamians were also Caucasoids, as seemingly were also the creators of the related Indus Valley civilization in the Indian subcontinent. The ancient Egyptians were initially Caucasoid Hamites; Caucasoid Asian Semites have through history contributed much to science and the arts; Caucasoid Semites were largely responsible for our Western alphabet; and Caucasoid Arab Semites produced the present numbering system, superior to that of the Romans. They invented the ship's rudder, replacing the steering oar. Caucasoid Aryans brought the rich Vedic literary and philosophical tradition into India, which was subsequently renowned for its mathematics and other achievements,

including even the spinning wheel.[8] Through history there has been considerable genetic expansion from the temperate zones into the more tropical areas, with resultant admixture of Homo sapiens genes with those of the older stocks inhabiting those areas. But the highest levels of achievement and creativity seem always to have been linked with those populations, Caucasoid and Mongoloid, which evolved during the past fifty or more thousand years under severe selective pressures in the harsher environment of northern Eurasia, and retained their racial integrity by remaining close to those areas.

Tomorrow's Need for Creative Individuals

The science of genetics, unknown two centuries ago, has made major strides during the past half century. In another generation or two, eugenics (already being applied in medicine) will be far more perfect than it is today. But we know enough to assert that the really creative are likely to be the children of parents of high intelligence and parents who have themselves proved to be at least modestly creative. It follows that it would be good to have more highly creative peoples such as these so that they and their society may continue to progress into the future.

Yet when we consider Western society today, what do we find?

Since 1914 it has selectively pruned out those who were of proven ability, by warfare between nations (the high death rate among air crew, for example), and, in revolutions, by warfare between classes.

Even more sinister, at a time when the Third World population is exploding, the Caucasoid peoples are voluntarily committing autogenocide. Their birth rate averages 1.8 children per couple, when 2.1 children per couple are necessary just for replacement. Contrast this with Africa, for example, where women in general average six live births. Also, contrast this with conditions in Benjamin Franklin's time. Writing about the American colonists, Franklin commented that: "Our people must be at least doubled every 20 years." Now, at a time of Third World population explosion, the West is not merely failing to replace itself, generation by generation, but its numbers have diminished to 15% of the total world population, and it is losing ground every year. What is more, its homelands, its racial breeding grounds, are being invaded in increasing numbers by the surplus population from the Third World, which is not only promoting hybridization but could in the course of time eventually swamp the declining population of indigenous Caucasoids.

What Can be Done?

As a result of scientific advances, we are fast reaching a stage where society -- and civilization itself-- will depend for its future on the continued supply of an increasing number of highly intelligent and highly creative people. The Caucasoid West seems to be already facing a decline in the prevalence of such people among its present generation. American universities are

drawing heavily from the brighter Mongoloids and the more talented of the Indian Caucasoids of South Asia. But what happens if the supply also begins to run low through a failure there among the more intelligent and more creative peoples to breed as rapidly as the less capable? How can the West, or any peoples, produce more intelligent and creative-type individuals? Herman J. Muller, the Nobel Prize-winning geneticist from Texas University, recognized this problem, just as he recognized the problem of the spread of deleterious genes throughout modern populations as a result of modern man's changed breeding habits.[9] Others have since then also given their attention to this problem.

A more favorable attitude toward having children could be restored to educated, intelligent people in general. Today the media and entertainment industry both emphasize to literates the cost and encumbrance which the birth of children represents to parents. They too seldom mention that children enrich the parents' lives beyond all else. The printed media could stop discouraging the birth of future readers.

Higher education should be accomplished without interfering with normal childbearing. Today, the best years for reproduction are often spent instead in higher education. As Mark Twain put it: "Education is not so sudden as a massacre, but is equally deadly in the long run." If a people would support its truly educable young couples well enough so that they could combine abundant childbearing with the simultaneous acquisition of higher learning, this would raise the genetic quality of the nation's posterity. No others could match it unless they were to do likewise.

But there is a project, which though minuscule today, serves as an example that needs to be emulated many times over. It has demonstrated what can be done. It is not just another proposal; it is a project that is working. It gives children the best possible start in life. If its principles were employed on a national, or even international, scale it could materially increase the number of potentially creative individuals for posterity.

This latter was the brainchild of the Nobel laureate Hermann J. Muller. Muller was no snob, but he valued quality. Once a Communist party member, he broke with Marxism when it condemned the science of genetics and, most particularly, eugenics. Seeing the danger to future generations of Man, if intelligence and especially creativity declined, Muller discerned a way voluntarily to increase the distribution of genes for high intelligence, creativity and other favorable qualities without impinging on the mores of our society.

There are many married couples of high intelligence and inherent ability, he perceived, where the wife is healthy and intelligent, but cannot give birth to offspring because of the infertility of her husband. If germinal repositories containing sperm from healthy, intelligent and creative males were available for their use, those couples who wished to have a child could ensure that the donated sperm would be of high quality. Such germinal repositories would make available to the parents all relevant facts about the health, physical qualities, achievements and intelligence

of the donor male. They would be "repositories for germinal choice." Muller often rated his idea that such repositories should be established as being the most important that he had offered Mankind in the entire course of his life. He ranked it as more significant than the research on mutations for which he received his Nobel prize. Repositories can turn the current increase in male infertility into an opportunity for the betterment of posterity.

The Repository for Germinal Choice in Escondido

The first repository for the propagation of intelligence and creativity began to function in 1980. To date it has engendered 187 infants (and 19 more are on the way). All are remarkably bright, healthy and happy youngsters. Their vocabularies are large, in some instances more than twice the expected. All who have been examined are above average in development and some are at least gifted. It remains to be seen how many will be significantly creative adults, but biographical research has found that notably creative persons have typically shown a constellation of traits when they were children that now are appearing in a number of children who have resulted from the repository. The Repository serves as a pioneering example of what can be accomplished by constructive concern for the genetic component of offspring. It is best understood from the viewpoint of the recipients of the repository's services.

Recipients are married couples who want children but cannot have them because of the infertility of the husband. The Repository can supply under liquid nitrogen the germinal material which enables the wife to become a mother. The couple are provided with detailed information about a number of germinal donors and may choose from this the one they would prefer as the biological father of their child (hence the term: germinal choice). Since the offspring will spend a lifetime profoundly influenced by the genes of the donor (as well as those of the mother), the repository undertakes to supply genes from the most intellectually creative and productive donors to be found. It goes to Nobelists and younger healthy, creative men who, though unpaid, are willing to increase the distribution of genes which helped to make them outstanding. Some of these are men whose accomplishments are widely recognized. Some have resolved problems which were previously unresolved. The world can have more creative human assets such as these. The system enables the mothers to have the most intellectually promising children possible for them. With bright mothers and genius fathers the probability of bright, healthy and creative children is maximized. Even if none of these children turn out to be significantly creative, they still will enrich the human gene pool through a wider distribution of genes for high intelligence and creativity than would have taken place otherwise.

More than 100 of the repository children are the offspring of leading scientists. These are in addition to the scientists' own families. Without the Repository, these fortunate children would not have been born, and the outlook for the future prospects of Mankind would be even poorer than it is now.

Conclusion

If there were hundreds of repositories, at least one in each city of size, this could result in thousands more of bright, useful citizens, some of them potentially creative.

In this century, the new science of genetics has powerfully reinforced man's ability to transcend himself and thus to reach new heights of competence. For the first time a living species has both the understanding and the ability to improve itself. Man may increase his competence until he manages himself and his globe far more wisely than today. Amid the justified concern about diminishing natural resources, he can increase his ultimate and most inexhaustible resource: human intelligence. And high intelligence, when specially empowered by a deeply-felt need or a penetrating curiosity, sometimes results in that rare and wonderful flowering which we call human creativity.

1 Mankind must also rely on intelligence to avoid extinction in life-threatening ecological disasters, and even for the development of techniques to repair ecological damage already done.

2 See *The IQ Controversy: The Media and Public Policy* by Mark Snyderman and Stanley Roth, Transaction Books, 1988. Indeed, if intelligence were not primarily genetic, evolution could never have produced any form of intelligence.

3 See *Shockley on Eugenics and Race*, (Ed., Roger Pearson) 1992, Washington D.C.: Scott-Townsend Publishers.

4 Arthur R. Jensen, in *Straight Talk About Menial Tests*, 1981, New York: The Free Press. P.247.

5 In a number of areas, East Asian scientists have produced scientific innovations in technical areas initiated or enhanced by Caucasoids. For purely illustrative purposes, consider the following instances of Mongoloid creativity compared with concomitant Caucasoid contributors: Fermi - weak interaction theory, Yukawa - strong interaction theory; Kendall - cortisone, Li -ACTH, MSH and ribonuclease; Cronin and Fitch -CPT symmetry, Lee and Yang - refinement of parity; Hull - magnetodes, Esaki - tunnel diodes; Wilson - cloud chamber, Fukui and Miyamoto -spark chamber.

6 For a summary of the theory of early migration by the descendants of Cro-Magnon (early Caucasoids) into other lands, and thought-provoking ideas relating to the history of high intelligence among Caucasoids and Mongoloids and amongst other populations containing some degree of genetic admixture of these more highly intelligent races, see " *The Upper Paleolithic Revolution*" by David de Laubenfels, pp 61-83, in *Evolution, Creative Intelligence and Intergroup Competition* (Ed. Alan McGregor) 1986, Mankind Quarterly Monograph No. 3.

7 Ibid.

8 Recently, Caucasoid Indian scholars have made substantial contributions in various scientific areas. As with the East Asian Mongoloids, we can see how their achievements match up against those of Europoids by the following sample list: Fermi - Dirac statistics, Bose -Einstein statistics; Heisenberg - matrix mechanics, Raman - spectra; Nirenberg - genetic code contributions, Khorana - the same area; Glashow - electroweak interaction, Salam - the same; Weinberg; Schwarzschild -black holes, Chandrasekhar - the same; Feynman - quantum electrodynamics, Ramanujan - number theory.

9 See Herman J. Muller, *Out of the Night.' A Biologist's View of the Future*, (London: Victor Gollancz, 1936).

Sources of Human Psychological Differences

Sources of human psychological differences: the Minnesota study of twins reared apart.

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Since 1979, a continuing study of monozygotic and dizygotic twins, separated in infancy and reared apart, has subjected more than 100 sets of reared-apart twins or triplets to a week of intensive psychological and physiological assessment. Like the prior, smaller studies of monozygotic twins reared apart, about 70% of the variance in IQ was found to be associated with genetic variation. On multiple measures of personality and temperament, occupational and leisure-time interests, and social attitudes, monozygotic twins reared apart are about as similar as are monozygotic twins reared together. These findings extend and support those from numerous other twin, family, and adoption studies. It is a plausible hypothesis that genetic differences affect psychological differences largely indirectly, by influencing the effective environment of the developing child. This evidence for the strong heritability of most psychological traits, sensibly construed, does not detract from the value or importance of parenting, education, and other propaedeutic interventions.

Monozygotic and dizygotic twins who were separated early in life and reared apart (MZA and DZA twin pairs) are a fascinating experiment of nature. They also provide the simplest and most powerful method for disentangling the influence of environmental and genetic factors on human characteristics. The rarity of twins reared apart explains why only three previous studies of modest scope are available in the literature [1-4].

More than 100 sets of reared-apart twins or triplets from across the United States and the United Kingdom have participated in the Minnesota Study of Twins Reared Apart since it began in 1979. Participants have also come from Australia, Canada, China, New Zealand, Sweden, and West Germany. The study of these reared-apart twins has led to two general and seemingly remarkable conclusions concerning the sources of the psychological differences - behavioral variation - between people: (i) generic factors exert a pronounced and pervasive influence on behavioral variability, and (ii) the effect of being reared in the same home is negligible for many psychological traits. These conclusions will not come as revelations to the many behavioral geneticists who have observed similar results and drawn similar conclusions [5]. This study and the broader behavioral genetic literature, nevertheless, challenge prevailing psychological theories on the origins of individual differences in ability, personality, interests,

and social attitudes [6]. Here we summarize our procedures and review our results and interpretations of them.

Participants complete approximately 50 hours of medical and psychological assessment. Two or more test instruments are used in each major domain of psychological assessment to ensure adequate coverage (for example, four personality trait inventories, three occupational interest inventories, and two mental ability batteries). A systematic assessment of aspects of the twin's rearing environments that might have had causal roles in their psychological development is also carried out. Separate examiners administer the IQ test, life history interview, psychiatric interview, and sexual life history interview. A comprehensive mental ability battery is administered as a group test. The twins also complete questionnaires independently, under the constant supervision of a staff member.

Reared-apart twins have been ascertained in several ways, such as: (i) friends, relatives, or the reunited twins themselves, having learned of the project, contact the Minnesota Center for Twin and Adoption Research (MICTAR); (ii) members of the adoption movement, social workers, and other professionals who encounter reared-apart twins serve as intermediaries; (iii) twins who are, or become aware of, a separated co-twin solicit assistance from the MICTAR staff in locating this individual. Selection on the basis of similarity is minimized by vigorously recruiting all reared-apart twins, regardless of known or presumed zygosity and similarity. We have been unable to recruit to the study six pairs of twins reared apart whom we believe to be monozygotic.

Zygosity diagnosis is based on extensive serological comparisons, fingerprint ridge count, and anthropometric measurements. The probability of misclassification is less than 0.001 [7]. Where appropriate, our data are corrected for age and sex effects [8]. Due to space limitations and the smaller size of the DZA sample (30 sets), in this article we focus on the MZA data (56 sets). The results reported here are, for the most part, based on previously reported findings, so that the sample sizes do not include the most recently assessed pairs and vary depending on when in the course of this ongoing study the analyses were conducted.

As shown in Table 1, the sample consists of adult twins, separated very early in life, reared apart during their formative years, and reunited as adults. Circumstances of adoption were sometimes informal, and the adoptive parents, in comparison to parents who volunteer to participate in most adoption studies, have a lower level of education (mean equals 2 years of high school), and are quite heterogeneous in educational attainment and socioeconomic status (SES). Because our sample includes no subjects with IQs in the retardate range ([is less than or equal to] 70), the mean IQ is higher and the standard deviation lower than for the general population.

[Tabular Data Omitted]

Components of Phenotypic Variance

If genetic and environmental factors are uncorrelated and combine additively (points we return to later), the total observed variance, $[V.sub.t]$, of a trait within a population can be expressed as

$$[V.sub.t] = [[V.sub.g] + [V.sub.e] + [V.sub.m]$$

where $[V.sub.g]$ is variance due to genetic differences among people, $[V.sub.e]$ is variance due to environmental or experiential factors, and $[V.sub.m]$ is variance due to measurement error and unsystematic temporal fluctuations. For measures of psychological traits, $[V.sub.m]$ ranges from approximately 10% (of $[V.sub.t]$) for the most reliably measured and stable of traits (for example, IQ) to as high as 50 to 60% for traits that are less reliable or that show considerable secular instability (for example, some social attitudes). The environmental component, $[V.sub.e]$, can be divided into variance due to experiences that are shared, $[V.sub.es]$, and experiences that are unshared, $[V.sub.eu]$. Shared events may be experienced differently by two siblings (for example, a roller coaster ride or a family vacation), in which case they contribute to the $[V.sub.eu]$ component. If the total variance, $[V.sub.t]$, is set at unity, the correlation between MZ twins, $[R.sub.mz]$, equals $[V.sub.g] + [V.sub.es]$. The heritability of a trait equals $[V.sub.g]$; the heritability of the stable component of a trait (for example, the mean value around which one's aggressiveness varies) equals $[V.sub.g]/([V.sub.t] - [V.sub.m])$. $[V.sub.t]$ and $[V.sub.m]$ can be estimated from studies singletons, but $[V.sub.g]$ is more elusive: for monozygotic twins reared together (MZT), some of the within-pair correlation might be due to effects of shared experience, $[V.sub.es]$. The power of the MZA design is that for twins reared apart from early infancy and randomly placed for adoption, $[V.sub.es]$ is negligible, so that $[V.sub.g]$ can be directly estimated from the MZA correlation.

Similarity in the IQ of MZA Twins

The study of IQ is paradigmatic of human behavior genetic research. There are more than 100 relevant twin, adoptee, and family studies of IQ, and IQ has been at the center of the nature-nurture debate [9]. The analysis of IQ is also paradigmatic of the approach taken by this study. It illustrates our use of replicated measures, evaluation of rearing environmental effects, and analysis of environmental similarity. We obtain three independent measures of IQ: (i) the Wechsler Adult Intelligence Scale (WAIS); (ii) a Raven, Mill-Hill composite; and (iii) the first principal component (PC) of two multiple abilities batteries.

The WAIS consists of a set of six verbal and five performance subtests that are individually administered, requiring about 1.5 hours, and that yield an age-corrected estimate of IQ [10]. To avoid examiner bias, we administer the WAIS simultaneously to the twins in different rooms by professional psychometrists. The Raven Progressive Matrices (Standard Set) is a widely used nonverbal measure of problem-solving ability often paired with the Mill-Hill Vocabulary Test, a multiple-choice word knowledge test [11]. In this study, the Raven and Mill-Hill are both

administered and scored by computer. The two age- and sex-corrected scores are transformed to have a mean equal to 50 and a standard deviation of 10. The sum of these transformed scores (which intercorrelate about 0.57) provides a separate estimate of IQ. The first major ability battery included in our assessment is an expanded version of the battery used in the Hawaii Family Study of Cognition [12]. The second major ability battery is the Comprehensive Ability Battery [13]. Detailed results from analysis of both tests are reported elsewhere [14].

In each of the three prior studies of MZA twins, two independent estimates of intelligence were obtained. The sample sizes and intraclass correlations for all four studies are compared in Table 2. The table illustrates the remarkable consistency of the MZA correlations on IQ across measurement instrument, country of origin, and time period. These correlations vary within a narrow range (0.64 to 0.74) and suggest, under the assumption of no environmental similarity, that genetic factors account for approximately 70% of the variance in IQ.

This estimate of the broad heritability of IQ is higher than the recent estimates (0.47 to 0.58) based on a review of the literature that includes all kinship pairings [9, 15]. Virtually the entire literature on IQ similarity in twins and siblings is limited, however, to studies of children and adolescents. It has been demonstrated [16] that heritability of cognitive ability increases with age. A heritability estimate of approximately 70% from these four studies of mainly middle-aged adults is not inconsistent with the previous literature.

Do Environmental Similarities in Rearing

Environments Explain MZA IQ Similarity?

Such marked behavioral similarities between reared-apart MZ twins raise the question of correlated placement: were the twins' adoptive homes selected to be similar in trait-relevant features which, in turn, induced psychological similarity? If so, given that the total variance equals 1.0, then $[V_{\text{sub.es}}]$ will equal at least $[R_{\text{sub.ff}}] \times [r_{\text{sub.ft}}^2]$, where $[R_{\text{sub.ff}}]$ is the within-pair correlation for a given feature, f , of the adoptive homes (the placement coefficient), and $[r_{\text{sub.ft}}]$ is the product-moment correlation between the feature and the trait in question, t .

A checklist of available household facilities (for example, power tools, sailboat, telescope, unabridged dictionary, and original artwork) provides an index of the cultural and intellectual resources in the adoptive home [17]. Each twin completes the Moos Family Environment Scale (FES), a widely used instrument with scales describing the individual's retrospective impression of treatment and rearing provided by the adoptive parents during childhood and adolescence [18]. The age- and sex-corrected placement coefficients for these and other measures are shown in Table 3, together with the correlations between twins' IQ and the environmental measure ($[r_{\text{sub.ft}}]$) and the total estimated contribution to MZA twin similarity. The maximum contribution to MZA trait correlations that could be explained by measured similarity of the

adoptive rearing environments on a single variable is about 0.03(19). The absence of any significant effect due to SES or other environmental measures on the IQ scores of these adult adopted twins is consistent with the findings of other investigators [20]. Rearing SES effects on IQ in adoption studies have been found for young children but not in adult samples [21], suggesting that although parents may be able to affect their children's rate of cognitive skill acquisition, they may have relatively little influence on the ultimate level attained.

[Tabular Data Omitted]

Has Pre- and Post-Reunion Contact Contributed to MZA Twin Similarity in IQ?

MZA twins share prenatal and perinatal environments, but except for effects of actual trauma, such as fetal alcohol syndrome, there is little evidence that early shared environment significantly contributes to the variance of psychological traits. Twins are especially vulnerable to prenatal and perinatal trauma, but these effects are most likely to decrease, rather than increase, within-pair similarity [22]. There is evidence that twins who maintain closer contact with each other later in life tend to be more similar in some respects than twins who engage in infrequent contact [23]. It appears, however, that it is the similarity that leads to increased contact, rather than the other way around [24]. MZA twins in this study vary widely in the amount of contact they have had prior to assessment. All twin pairs spend their formative years apart. Some had their first adult reunion at the time of assessment, whereas others met as much as 20 years earlier and had experienced varying degrees of contact. A small number of the pair actually met at intervals during childhood. As shown in Table 1, total contact time for the MZA twins ranges from 1 to 1233 weeks. In the one case of 1223 weeks of contact, the twins met as teenagers and lived near each other until assessment when they were adults. Since they met on a regular basis, most of this time was coded as contact time. Degree of social contact between two members of a reared-apart twin pair accounts for virtually none of their similarity. The correlations with the within-pair absolute WAIS IQ difference are 0.06 [+ or -] 0.15 for time together prior to separation, 0.08 [+ or -] 0.15 for time apart to first reunion, -0.14 [+ or -] 0.15 for total contact time, and 0.17 [+ or -] 0.15 for percentage of lifetime spent apart(25).

The absolute within-pair difference in WAIS IQ of co-twins as a function of degree of contact are plotted in Fig. 1. Also shown are the expected absolute IQ differences between randomly paired individuals and between two testings of the same individual(26). Although the MZA average difference approximates the absolute difference expected between two testings of a single individual, we do observe a wide range of differences. It is not that we have found no evidence of environmental influence; in individual cases environmental factors have been highly significant (for example, the 29 IQ point difference in Fig. 1). Rather, we find little support for the types of environmental influences on which psychologists have traditionally focused [27].

Similarity of MZA Twins on a Variety of Dimensions

Table 4 [28] gives the MZA correlations, most previously published, on variables ranging from anthropometry and psychophysiology, to aptitudes, personality and temperament, leisure-time and vocational interests, to social attitudes. Correlations for MZT twins and retest stability coefficients are also provided for comparison. Stable, reliably measured variables like fingerprint ridge count and stature show the highest correlations. Brain wave spectra are highly reproducible [29] and are strongly correlated in both MZA and MZT twins. Most other psychophysiological variables (for example, blood pressure and electrodermal response) vary considerably across time so that the retest correlations between repeated measurements on the same persons range from 0.5 to 0.8(30). These retest correlations set the upper limit of similarity that might be found between MZ co-twins. The retest stability of aptitude measures, such as IQ, is rather better, ranging from 0.8 to 0.9 [10], whereas stability of personality and interest measures ranges from 0.6 to 0.7.

[Tabular Data Omitted]

With these upper limits in mind, the findings in Table 4 demonstrate remarkable similarity between MZA twins. In terms of standardized tests and measures, the MZA twin similarities are often nearly equal to those for MZT twins (last column) and constitute a substantial portion of the reliable variance (column 5) of each trait.

The Minimal Effect of Being Reared Together

Some of the MZA twins have had considerable contact as adults, but all of them were reared apart throughout the formative periods of childhood and adolescence. If being reared together enhances similarity in twins, within-pair correlations for MZA twins are expected to be smaller than those for MZT twins. For example, the mean MZT correlation for IQ, based on 34 studies of primarily children or adolescents, is 0.86 [9] as compared to 0.72 for all, primarily adult, MZA twins. If the mean MZT correlation were maintained into adulthood, its difference from the MZA correlation would suggest that common rearing increases the similarity of IQ in twins (and siblings). However, the MZT correlation apparently declines with age (for example, as a result of the accumulation of nonshared environmental effects) [16], in which even the small MZT-MZA correlation difference would suggest little influence of common rearing on adult IQ. In any case, a significant contribution of shared environment is found for the personality trait of social closeness(31), and possibly religious interests and values (32).

As illustrated in Table 4, however, adult MZ twins are about equally similar on most physiological and psychological traits, regardless of rearing status. This finding and the failure to find significant [r.sub.ft] effects for cognitive abilities [17] or personality (31), together with findings from numerous studies of MZT and DZT twins, sibs, and foster sibs, implies that common rearing enhances familial resemblance during adulthood only slightly and on relatively few behavioral dimensions. This conclusion is given detail discussion by Plomin and Daniels

[5].

[Tabular Data Omitted]

Why Are MZA Twins So Similar?

It is well known to naturalists and to animal breeders that there are wide and heritable differences in behavior within other species, but there is a curious reluctance among some scientists [33] to acknowledge the contribution of genetic variation to psychological differences within the human species. Our findings support and extend those from many family, twin, and adoption studies [15], a broad consensus of findings leading to the following generalization: For almost every behavioral trait so far investigated, from reaction time to religiosity, an important fraction of the variation among people turns out to be associated with genetic variation. This fact need no longer be subject to debate [34]; rather, it is time instead to consider its implications. We suggest the following:

1. General intelligence or IQ is strongly affected by genetic factors. The IQs of the adult MZA twins assessed with various instruments in four independent studies correlate about 0.70, indicating that about 70% of the observed variation in IQ in this population can be attributed to genetic variation. Since only a few of these MZA twins were reared in real poverty or by illiterate parents and none were retarded, this heritability estimate should not be extrapolated to the extremes of environmental disadvantage still encountered in society. Moreover, these findings do not imply that traits like IQ cannot be enhanced. Flynn [35], in a survey covering 14 countries, has shown that the average IQ test score has significantly increased in recent years. This increase may be limited to that part of the population with low IQs [36]. The present findings, therefore, do not define or limit what might be conceivably achieved in an optimal environment. They do indicate that, in the current environments of the broad middle-class, in industrialized societies, two-thirds of the observed variance of IQ can be traced to genetic variation.
2. The institutions and practices of modern Western society do not greatly constrain the development of individual differences in psychological traits. The heritability of a psychological trait reveals as much about the culture as it does about human nature. Heritability must increase as $[V_{sub.e}]$, the variance affected by the environment, decreases. Where the culture's influence is relatively homogeneous and efficacious, $[V_{sub.e}]$ will decrease and heritability will increase; most American boys, for example, have similar opportunities to play baseball, so that one expects heritability of baseball skill in American young men to be high. Where culture is efficacious, but heterogeneous, $[V_{sub.e}]$ (and total phenotypic variance) will increase; thus, one would expect the heritability of specific linguistic or religious behaviors in the United States or in the Soviet Union to be low. Individuals in Western societies are heterogeneous with respect to personality traits, interests, and attitudes, yet the heritabilities of these traits are relatively high. We infer that the diverse cultural agents of our society, in particular most parents, are less effective in imprinting their distinctive stamp on the children developing within their spheres of influence - or are less inclined to do so - than has been

supposed.

Psychologists have been surprised by the evidence that being reared by the same parents in the same physical environment does not, on average, make siblings more alike as adults than they would have been if reared separately in adoptive homes. It is obvious that parents can produce shared effects if they grossly deprive or mistreat all their children. It seems reasonable that charismatic, dedicated parents, determined to make all their children share certain personal qualities, interests, or values, may sometimes succeed. Our findings, and those of others [37], do not imply that parenting is without lasting effects. The remarkable similarity in MZA twins in social attitudes (for example, traditionalism and religiosity) does not show that parents cannot influence those traits, but simply that this does not tend to happen in most families.

3. MZA twins are so similar in psychological traits because their identical genomes make it probable that their effective environments are similar. Specific mechanisms by which genetic differences in human behavior are expressed in phenotypic differences are largely unknown. It is a plausible conjecture that a key mechanism by which the genes affect the mind is indirect, and that genetic differences have an important role in determining the effective psychological environment of the developing child [38].

Infants with different temperaments elicit different parenting responses. Toddlers who are active and adventurous undergo different experiences than their more sedentary or timid siblings. In addition, children and adolescents seek out environments that they find congenial. These are forms of gene-environment covariance, [C.sub.ge]. Moreover, different individuals pay different attention to or respond differently to the same objective experience, or both. These are forms of gene-environment interaction, [V.sub.ge]. From infancy onwards, genetic individually helps to steer the developing organism through the multitude of possible experiences and choices. That is, Eq. 1 must be elaborated to include these indirect and modifiable ways in which the genome exerts its influence

$$[V.sub.t] = [V.sub.g] + [V.sub.e] + [C.sub.ge] + [V.sub.ge] + [V.sub.m]$$

The proximal cause of most psychological variance probably involves learning through experience, just as radical environmentalists have always believed. The effective experience, however, to an important extent are self-selected, and that selection is guided by the steady pressure of the genome (a more distal cause). We agree with Martin et al. [39] who see "humans as exploring organisms whose innate abilities and predispositions help them select what is relevant and adaptive from the range of opportunities and stimuli presented in the environment. The effects of mobility and learning, therefore, augment rather than eradicate the effects of the genotype on behavior" (p. 4368).

In this view is correct, the development experiences MZ twins are more similar than those of DZ twins, again and environmentalist critics of twin research have contended. However, even

MZA twins tend to elicit, select, seek out or create very similar effective environments and, to that extent, the impact of these experiences is counted as a genetic influence. Finally, if the genome impresses itself on the psyche largely by influencing the character, selection, and impact of experiences during development - if the correct formula is nature via nurture - then intervention is not precluded even for highly heritable traits, but should be the more effective when tailored to each specific child's talents and inclinations. Relevance to Evolutionary Psychology and Sociobiology

This research focuses on individual differences, but like other animals we share certain species-specific tendencies by virtue of our being human. Whereas behavioral geneticists study variations within a species, evolutionary psychologists or sociobiologists attempt to delineate species-typical proclivities or instincts and to understand the relevant evolutionary developments that took place in the Pleistocene epoch and were adaptive in the lives of tribal hunter-gatherers. The genes sing a prehistoric song that today should sometimes be resisted but which it would be foolish to ignore.'

At the interface of behavioral genetics and sociobiology is the question of the origin and function, if any, of the within-species variability we have been discussing. One view is that it represents evolutionary debris [40], unimportant to fitness and perhaps not expressed in prehistoric environments. Another view is that variability has an adaptive function and has been selected for. Whether sociobiologists can make evolutionary sense of the varieties of human genetic variation we have discussed here remains to be seen [41].

Whatever the ancient origins and functions of genetic variability, its repercussions in contemporary society are pervasive and important. A human species whose members did not vary genetically with respect to significant cognitive and motivational attributes, and who were uniformly average by current standards, would have created a very different society than the one we know. Modern society not only augments the influence of genotype on behavioral variability as we have suggested, but permits this variability to reciprocally contribute to the rapid pace of cultural change. If genetic variation was evolutionary debris at the end of the Pleistocene, it is now a salient and essential feature of the human condition.

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Heredity or Environment ? An excerpt from David Duke's book "My Awakening: A Path to Racial Understanding"

Ch. 7: Heredity or Environment?

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There are many studies of twins, including a comprehensive study at the University of Minnesota by Dr. Thomas J. Bouchard Jr. that received worldwide attention. The study showed that the IQs of identical twins raised apart were much closer than random adopted children, and that they were even closer than for fraternal twins who were raised in the same home, and who attended the same schools. Not a single twin study has ever contradicted these results.

Let me emphasize this important point --identical twins growing up in completely different environments --with different parents, different schools, different diets, different political and religious persuasions --have IQs closer together than those of fraternal twins raised in the same family. If intelligence is primarily created by environmental factors, certainly the fraternal twins raised together in the same familial, social, and educational environment should obviously have much closer IQs than twins who were raised apart.

I looked up and read more studies demonstrating the power of heredity in intelligence and found that even those focusing on identical and fraternal twins raised together yielded additional strong evidence. Because fraternal and identical twins are born only minutes apart and usually grow up in the same environment, they provide a way to measure the impact of heredity, while environmental factors are held steady.

Identical twins' IQs are much more strongly correlated than are those of fraternal twins. Correlations generally run about .85 for identical twins raised together as compared to .60 for fraternal twins. Psychologists Bouchard and McGue reviewed over 100 studies comprising 40,000 kinship pairs, almost all of that type of cognitive study reported in the scientific literature.

In all the studies comparing identical and fraternal twins -- it is found that separated identical twins raised apart scored closer in IQ than fraternal twins raised together! Other sources of excellent data are found in studies of adopted children. Adopted children are closer to their genetic parents' IQs rather than with their foster parents who they grow up with.

The scientific research on intelligence has silenced all but the most belligerent egalitarians. Unfortunately the mass media in America are still promoting the unscientific and discredited environmentalist views of fringe neo-Marxist and far-left elements such as R. C. Lewontin, Steven Rose, Stephen Jay Gould, and Leon Kamin. The media almost always fail to mention

these men's political affiliations, such as Kamin's former position as New England editor of the U.S. Communist Party's weekly newspaper. Similarly ignored is Lewontin's pivotal role in the pro-Marxist, Vietnam era "Science for the People," and Gould's smug recounting of learning his Marxism on his father's knee. Much of the public is still largely unaware of the overwhelming scientific evidence showing the prominent role of genetics in determining human intelligence, but the scientific community has become aware of it. Snyderman and Rothman did extensive surveys of those scientists involved in psychological research and found that by the middle of the 1980s the vast majority believed that IQ was profoundly affected by heredity.

The Brain and Intelligence

Learning that IQ is primarily inherited made me ask the question, What precisely is inherited? Sophomoric as the answer seems; it is of course, the genes that construct the architecture and chemistry of the brain, along with all its overt and subtle variances. To accept the zero-heredity-impact argument of the Marxist Lamarckians, one is required to believe that, unlike any other human organ, the brain is not a product of the genes.

Scientists think that almost one-third of a human's genes are devoted to the brain, and those genes naturally vary. Intelligence is ultimately as physical as the structure that enables one to run with a football or shoot a basketball. It is rooted in the magnificent architecture and gray matter called the brain.

It is hard to imagine our minds as physically-rooted entities. After all, thoughts have no physicalness; we can't taste, touch, smell, see or hear them except in the confines of our own minds. Yet our brains are just as physical as the muscles in our arms and legs. Their construction and wiring is crucial to everything from our intelligence to our personality. Even our thoughts come from physical processes, both chemical and electrical, in our brains. The context of our mental abilities is dictated entirely by the structure, form, dimensions, density and chemical composition of the brain. If the structure of the brain were not important then we could teach any dog to read Dostoyevsky or any orangutan to understand organic chemistry. The more primitive structure and limited size of their animal brains prevent them from having high intelligence.

Because of the structure of some people's brains, not every human can be taught to read and write, much less understand the fundamentals of organic chemistry.

There are dramatic differences between the brain of the human and that of the dog, or for that matter, the orangutan -- that account for the differences in intellect between them. Even the dog and the orangutan have broad differences in their physical brains, and every zoologist would rate the orangutan as more intelligent than the dog. In fact, dog trainers report that there are sharp differences in intelligence between the different dog breeds, as well as distinctions in the breeds' temperaments and other aspects of personality.

When first faced with this information about intelligence in dogs, I wondered what difference between the breeds could account for the mental differences? Only one explanation seemed feasible to me: Different genetic heritages result in physically different brains.

Just because the human brain is larger and more complex than that of the dog or even the higher primates does not make it any less subject to the same laws of genetics. Each human brain is as unique as a fingerprint. In fact, brains are vastly more complex and diverse than fingerprints. Neuroanatomist Paul Glees, in his classic textbook *The Human Brain* states that the brain is the "signature of a genetically unique person." Most scientists agree that brains in higher primates and humans evolved larger over time because more voluminous and complex brains enabled problem-solving and learning skills. There is obviously a relation to the fact that a monkey has a large brain and is considered a more intelligent animal than a smaller-brained frog.

Even Charles Darwin cited numerous studies in support of his contention that "The belief that there exists in man some close relation between the size of the brain and the development of the intellectual faculties is supported by the comparison of the skulls of savage and civilized races, of ancient and modern people, and by the analogy of the whole vertebrate series."

What do the media gurus say about this? Years after I read my first article on brain size and intelligence, I read *The Mismeasure of Man*. Its author is an avowed Marxist, Stephen Jay Gould. He analyzed and tried to invalidate brain-size research data from the 19th century and therefore disputed the relationship between head size and intelligence. He ignored more recent -- and more scientifically precise -- studies of human brains by researchers such as Todd, Vint, Simmons and Connolly. There have been numerous studies since Gould's book that show a strong correlation between brain size and intelligence.

With modern MRI (magnetic resonance imaging) capabilities, extremely accurate measurements of the brains of living human beings can now be made. In a groundbreaking experiment at the University of Texas, 40 students were divided into two groups -- one with IQs above 130 and another with IQs below 103. Since that time numerous similar studies have been done. A remarkably clear correlation of .35 was found between brain size and intelligence, a correlation actually higher than most traditional studies that compared head measurements and IQ. It became obvious to me that intelligence was primarily hereditary simply because it was determined by the specific characteristics of the human brain

Ego and IQ

The biggest obstacle in discussing the genetic nature of intelligence is our own egoism. Even though human beings universally blame outside forces for their failures, we consistently take credit for our successes. We don't want to think that we are limited in our horizons because of the inherent limitations of our genes, and we certainly don't want to give too much credit to our

genes (something over which we have no control) for our achievements. We don't want to acknowledge that somebody else is truly smarter than we are. We can readily accept an athletic star's physical size and superiority but are reluctant to acknowledge mental superiority. Sure, many people can acknowledge an intellectual rival's educational level or experience, but most people are not as inclined to accept that a competitor has a superior mental ability. Yet hundreds of serious research studies continue to add to the evidence of genetic differences in intellectual ability. Indeed, general intelligence is one of the most highly heritable of all human traits.

As I read the studies of IQ and understood its great impact on our lives, I realized why the IQ issue was so important among racial egalitarians. Most people -- not just rural White "racists," but the leading egalitarians themselves -- readily equate human worth with high intelligence. If one brings up the argument that one race is more intelligent than another, the egalitarian instantly equates that position to be saying that the Black race is "inferior." It is odd that liberals who dismiss IQ tests as meaningless somehow equate low IQ with blanket inferiority.

How less assuming it is to see intelligence as part, albeit an important part, of the whole picture. IQ is only one of the characteristics that make up the human being, for a person can possess exceptional abilities and still not have an exceptional IQ. The way a person lives his life -- his responsibility, industriousness, honesty, courage, morality, and a thousand other qualities -- is also vital in evaluating his worth. To say that the Black race is inferior to the White race because the average IQ is lower among Blacks is much like saying that Whites are inferior to Blacks because the average Black is faster in the 100-yard dash.

Whatever their intelligence level, Black people were genetically well suited for their historical environment in Africa. To say that their inherited capacity to adapt to that environment rather than the environment of computers and aerospace engineering makes them "inferior" human beings is a totally subjective concept. They would be inferior to what we value, perhaps, but inferior to what they naturally value, no.

At the same time I came to understand all this, I also realized that Western civilization runs on a high IQ. It is the high-octane genetically-created fuel of our culture and of our technology. I concluded that if there is a significant difference between Black and White IQs, it will have a profound impact on our society. As I read more about IQ, I found out that the real political opposition to it erupted because of the racial implications. Now that I had a firm grasp of the relationship among intelligence, heredity and environment, I began to plow deeply into the subject of racial equality with a thirst for the truth.

As for myself, it has always been easy for me to accept my own mental inferiority in relation to many brilliant human beings. I have a respectable IQ, but when I read about and consider the special genius of men like Thomas Edison, Francis Galton, Isaac Newton and William Shockley, it is hard to be egotistical. Every human being is going to be inferior or superior at some endeavor. I am philosophical about it, for it doesn't diminish my own sense of self-worth

to know that there are many men and women born smarter than I am or physically Stronger than I am.

Nor does it boost my self-worth to know that there are innumerable cretins on this planet. I decided at an early age to simply seek the truth, not only because it was valuable for its own sake, but also because I believed that in the unvarnished truth we can find solutions to the monumental problems facing this nation and the Earth.

All of this afforded me a useful starting point: Once I came to accept the power of genes and the validity of IQ as an important measure of mental stature, I felt that I was ready to take on the more emotionally charged question of whether or not there are significant differences in Black and White intelligence and behavior.

Thomas Jefferson's words inspired me as I delved into the most controversial subject in America. "There is not a truth existing which I fear, or would wish unknown to the whole world."

About IQ and the 'g' Factor - an excerpt from David Duke's book "My Awakening: A Path to Racial Understanding"

Ch. 6: A Question of Intelligence

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In 1912 the German psychologist Wilhelm Stern proposed dividing the mental age of a child by his chronological age to establish an overall indicator of intelligence. In 1916 American psychologist Lewis Terman introduced the IQ as the scale of scoring for his hugely successful Stanford Revision of the Binet Scales, the famous "Stanford Binet." David Wechsler later developed the IQ tests most widely used today. He dropped the "mental age" concept and used instead the relation of an individual's IQ score to the average IQ score for his age -- calling it "deviation IQ."

The critics of IQ testing were quick to point out that IQ is an abstract concept that may have no bearing on the real world. They quoted Dr. Edward Boring of Harvard, who wrote in 1923, "Intelligence as a measurable capacity must at the start be defined as the capacity to do well in an intelligence test. Intelligence is what the tests test."

The statement is fundamentally true, but the same could be said of all tests. After all, a driver's license test determines only how well an individual does on the test, not necessarily how well he drives. However, no one would seriously argue that people who fail the driving test, on average, drive as well as those who have perfect scores.

Arthur R. Jensen, professor of Educational Psychology at the University of California at Berkeley, in expanding the work of pioneering English psychologist Charles Edward Spearman, substantiated the fact that all tests of mental ability have positive correlation with each other.²² If a person scores below average in one type of mental-abilities test, he is likely to score below average in another type. Conversely, if he is above average in one, he is likely to score similarly high in another. Those who do well in reading, for instance, usually do well in math. The concept of the importance of general intelligence, or "g" intelligence as it is known academically, is accepted by a large majority of scholars and authorities in psychology.

The best way to determine whether IQ testing measures an important factor in relation to achievement is to compare large numbers of individuals' test scores with their later achievements in school and career, comparing how they match up.

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The Bell Curve also shows that IQ has a strong correlation with a number of educational and

societal factors, including grades in school, educational level attained, income, business success, and even social factors such as tendencies toward criminality, illegitimacy, and welfare dependence.

Another famous study examined the careers of similarly educated brothers who grew up together in Kalamazoo, Michigan. Kalamazoo has been testing all of its public school students since 1924 and offers a wealth of information. The studies showed that for brothers who had the same education and same family life, the young brothers, with an IQ difference of 15 points between them, averaged a 14 percent difference in income at middle age, with the high-IQ brother having the higher income.

Job performance and productivity correlate with IQ the same way that personal success and income do. In the December 1986 *Journal of Vocational Behavior*, John E. Hunter, an industrial psychologist at Michigan State University, disclosed that high-complexity job performance correlated .58 with IQ scores. Even in low-skill jobs, intelligence correlated to overall job performance by .23. [Correlation measures how closely two properties are connected. A correlation of +1 means perfect association and 0 means they are completely independent. When the correlation is -1 that means that when one increases, the other always falls.]

Hunter argues that in all jobs intelligence predicts performance, but the factor is even more important in high-complexity occupations. From the classic studies mentioned above, to the latest research of the '90s, the results are overwhelmingly consistent, intelligence does matter.

For all the high-minded language used by the egalitarian politicians and the U.S. Government, the commanders of the United States military readily accept the link between intelligence and later performance. Military authorities give every recruit what it calls an Armed Forces Qualification Test (AFQT). They don't call it an IQ test, but it does measure mental ability and is, in essence, an IQ test. Linda Gottfredson has pointed out that the military is prohibited by law (except under a declaration of war) from enlisting recruits below the 10th percentile level.

That law was enacted because of the extraordinary high training costs and high rates of failure among such men during the mobilization of forces in World War II. A U.S. Department of Defense report states, "People with high AFQT scores are likely to achieve skill proficiency earlier in their first enlistment than those with low scores."

An example of how powerfully IQ affects different areas of society can be seen in automobile accident rates. Australian psychologist Brian O'Toole showed a powerful inverse correlation between IQs and accident mortality rates. In a study of 46,166 men who previously served in the Australian armed forces, he found that those who had scores in the Army General Classification Test correlated to IQs of between 80-85, had almost three times the death rate due to motor vehicle accidents than those who scored in the 100-115 range. The mortality figures may be even more extreme for even lower IQ levels, but those who scored lower than an

equivalent IQ of 80 were rejected from service, so there were no records for them. O'Toole wrote: "[P]eople with lower intelligence may have a poorer ability to assess risks and, consequently, may take more poor risks in their driving than do more intelligent people."

As I delved deeper into the IQ issue in the mid-'60s, I was amazed at the difference between the media discussion of the IQ controversy and the scientific literature on the subject. I began reading the papers of a number of psychologists who argued quite persuasively for the importance of IQ, but it seemed that these scientists and their studies received very little coverage in the popular media. Instead the media repeatedly suggested that IQ really did not mean anything. The popular media also suggested that only "racists" believe in a strong link between intelligence and heredity. There is a wealth of information on the important role of genetics in intelligence, but the media for the most part still ignores it, and repeatedly parrots the line that "there is no scientific evidence showing that intelligence is inherited." A more untrue statement has never been spoken.

About racial differences - An excerpt from David Duke's book "My Awakening: A Path to Racial Understanding"

Ch. 8: RACE AND INTELLIGENCE

It was easy for me to understand why the egalitarians were opposed to the studies showing that IQ is mostly hereditary, for it turns out that Blacks usually do very poorly on IQ tests. The natural inference is that if IQ is primarily inherited, and Blacks have dramatically lower IQs, then the differences between the races are likely to be genetic.

I found that there are hundreds of studies documenting the IQ differences between Blacks and Whites. Dr. Audrey Shuey, in her comprehensive work *The Testing of Negro Intelligence*, compiled more than 300 different IQ studies comparing Black and White intelligence. They found that average Black IQ scores are between 15 and 20 points lower than White averages -- in scientific terms, they vary between one and one and one-half standard deviations [SD] below Whites.

The fact that dramatic IQ differences exist between Blacks and Whites can also be illustrated by the fact that Black activist groups have outlawed ability grouping in many schools, claiming that it "resegregates the schools." In California it is even forbidden to use IQ tests to aid in the selection of students who would benefit from special classes for the educable mentally retarded. A courageous Black mother sued the state in an attempt to overturn the law so that her retarded child could get the remedial help she needed. In the *Larry P. v. Wilson Riles* case, the judge ruled that the tests were biased simply because more Blacks attained very low scores. Thus in the State of California it became official policy that the tests, along with ability grouping in education, are "racist" and forbidden merely because Black performance is substantially lower than that of Whites. The case affords an excellent example of how efforts to artificially "equalize" the races can harm both Whites and Blacks.

I must stress that comparisons between White and Black scores are of averages of the groups. Because Blacks as a group score lower in IQ than Whites does not mean there are not some individual Blacks who score in the highest category and some Whites who score in the lowest. However, when one contrasts the overlapping bell-shaped curves of IQ performance by race and looks at the Black-White difference at different levels, it becomes obvious that the race difference becomes more pronounced at the high and low extremes of the distribution. For instance, One-half of all Blacks score in the lowest one-quarter of Whites.

On the high end of the scale, an IQ of at least 115 is considered necessary for excellent college work or for the top managerial and professional jobs in America. Only about 2.5 percent of Blacks score that high as compared to about 16 percent of Whites. About 20 times more Whites than Blacks per capita have IQs over 130, and somewhere between 50 and 100 more Whites are

in the above 140 IQ range. This is the IQ group that many psychologists believe is responsible for most of the greatest achievements of civilization.

Black representation at the low-scoring end of the IQ scale has even stronger implications for society. At least 25 percent of Blacks are below 75 in IQ, and an IQ in the 70-75 range is classified as "borderline retarded" by most psychologists. Practically no one in that IQ range will graduate from high school or even learn much of elementary school basics; none will qualify for the armed forces, and few will be able to find good employment.

After learning the truth about racial differences in IQ and going public with it, for years I faced media condemnation as a "racist" for daring to say that 20 percent of Blacks had IQs below 75. In October 1994, many years after my first statements on the matter, Newsweek magazine did a cover story on the release of *The Bell Curve*, the groundbreaking book on IQ and racial differences. Newsweek matter-of-factly stated that 25 percent (rather than 20 percent) of Blacks fell into that lowest category. It took 24 years, but I had been eclipsed in my radical racial opinions by Newsweek.

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"At the undergraduate college level, the equation for white students has usually been found to result either in predicted grades for blacks that tend to be about equal to the grades they actually achieve or. . .somewhat better than the grades they actually achieve. . . . The results do not support the notion that the traditional use of scores in a prediction equation yields predictions for blacks that systematically underestimate their actual performance. If anything, there is some indication of the converse. . . ."

Finding that the tests are biased against Whites, albeit modestly, illustrates once again that the truth of the matter is exactly opposite what the popular mass media regularly tells Americans. The Black-White IQ difference is not a result of the tests' cultural bias or discrimination, it is real.

Black IQ Is Markedly Lower, But. . .

As the studies of marked IQ differences between races increasingly mounted in the scientific community, racial egalitarians retreated to new ground. Many of them abandoned the "IQ is meaningless" and "tests are biased" arguments. They suggested that if Blacks had lower IQs than Whites (which had become patently undeniable), that it was simply because they grew up in "deprived" environments. The egalitarians blamed socioeconomic factors such as poverty and low parental education levels for low Black IQ scores.

However, many studies of Blacks and Whites take socioeconomic factors into account. They consistently find that even those Blacks who come from high income and well-educated

families still have markedly lower IQs than Whites.

SAT scores correlate very highly with IQ and the testing service has gathered information on the parental income, education, and race of its test-takers. It finds that Black students with a household income of more than \$70,000 a year and who have at least one parent who is a college graduate -- score lower on the SAT than Whites from households that make less than \$20,000 annually and in which both parents are high-school dropouts. The most environmentally disadvantaged group of Whites who take the SAT -- score higher than the most environmentally advantaged group of Blacks.

The psychological data for genetic explanations for poor Black performance in IQ are extensive and powerful. IQ studies including Blacks, Whites, and Asians have extensively correlated many socioeconomic factors, including family income, parental education level and occupation status, and school quality. Groups of low-income Whites with low parental education levels and low parental occupation statuses consistently score higher in IQ than Blacks from families of high income, high education levels and high occupation status.

The Harm of Ignoring Racial Differences

The argument that environmental conditions cause the difference in IQ levels between the races, admits that a real difference exists. If there is a real difference in the IQs of Black and White children --for whatever reason --it certainly suggests the ending of school integration, for it is far better for children to group them in line with their natural abilities.

A good example of the harm caused by ignoring IQ differences could be found in a classroom that has very bright and very slow-learning children side by side. The instruction is bound to be too challenging for the mentally slower child, who cannot keep up and thus becomes utterly lost and frustrated. On the other hand, the teaching will be too slow to challenge the bright child whose potential goes untapped. If such mental differences in the classroom fall along racial lines, one can imagine how tensions and ill-will can develop between the diverse groups.

Even though the races are clearly different in learning ability, the government operates on the false premise of equality. When California outlawed affirmative action in its college entrance programs, there was a dramatic decline in Black and Mexican acceptance in the best academic schools. Egalitarians bewailed the results as unfair to Blacks and Mexicans. But what the lower minority numbers actually prove is that better-qualified Whites had been grievously discriminated against.

It has been more than 80 years since the first IQ studies were conducted involving both Whites and Blacks. In the 1990s Blacks score the same IQ in relation to Whites as they did in the 1920s, about 15 to 20 points lower. For 70 years, standards of living education, and employment opportunities have dramatically improved for Blacks, and they have been accompanied by

massive school and social integration. Yet dramatic socioeconomic improvement has not raised Black IQ scores in relation to those of Whites.

The evidence is also clear that the IQ gap has not been narrowed by increasing educational stimulation in the Black child's early years, or by publicly-integrated schooling. If there is any effect at all, it has only widened the gap. The multibillion dollar Head Start preschool environmental-enrichment program, maintained primarily to help Blacks compete educationally, has resulted in no gains by Black students but a little gain by Whites. An extensive and excellent study was done by J. Currie and D. Thomas showing Head Start's abject failure. Head Start is the most expensive and widespread program to raise the educational performance of disadvantaged youths.

The Scarr Study

Genetic origins of lower Black intelligence can also be seen in a number of studies that chart proportional Black ancestry. One of the first major studies was done as early as 1916 in Virginia. Large groups of Black school children were divided in groups determined by the number of White and Black grandparents. All the Black subjects, pure or partially Black, were raised in the Black community's environment. The Blacks with four Black grandparents scored the lowest in IQ. Blacks with three Black grandparents and one White --a bit higher; Blacks with two White grandparents --higher still; and Blacks with three White grandparents scored highest in IQ among the Black children. The most recent studies of the 1990s show precisely the same results.

One of the most powerful direct studies of race and environment was conducted by psychologists Sandra Scarr, Richard Weinberg and I. D. Waldman. All three are quite well known for their environmentalist opinions. The study analyzed White, Black and mixed-race adopted children in more than 100 White families in Minnesota. The study was an egalitarian's dream, because the children's adoptive parents had prestigious levels of income and education and were antiracist enough to adopt a Black child into their own family. Scarr is a strong defender of racial equality and maintained that environment played an almost exclusive role in IQ differences between the races. Scarr supports the importance of heredity in causing individual differences within a race, but she has argued that the between-race differences are mostly environmental.

The children in the study included adopted Whites, Blacks, and Mulattos as well as the biological children of the White adoptive couples. At the age of 7, the children were tested for IQ and all of the groups, including the Blacks and Mulattos, scored above average in IQ. Scarr and Weinberg published a paper claiming to have proven the almost exclusive power of environment over race in IQ, even though they had to admit that the White children, whether adopted or not, scored well above the Black and Mulatto children and that the Mulatto children scored above the Blacks.

A decade later, when the children reached the average age 17, a follow-up study was conducted that again included IQ measurements. As they matured, Black children had dropped back to an average of 89 in IQ, which is the average IQ for Blacks in the region of the United States where the study was done. The White adopted children scored an average of 106 in IQ, 17 points higher than the Black children, which is consistent with traditional studies of Black and White IQ differences. In line with genetic theory, the half-White, half-Black Mulatto adopted children scored almost exactly between the adopted Whites and Blacks.

Scarr and Weinberg reluctantly published their data from the follow-up survey, but they waited close to four years to do so, almost as if they were embarrassed by what they had found. Through a tortured reasoning process, they still argued that environment played a dominant role in IQ. But in their follow-up survey, unlike their first paper, they also admitted that genes had an important impact as well. Both Richard Lynn and Michael Levin effectively showed in their reanalyses of Scarr's own data, that genes clearly comprise the dominant role in intelligence levels of those adopted children.

African IQ Studies

Genetic tests indicate that almost all American Blacks have some White genes, while only one percent of Whites have Black genes. This probably occurred because American society classified every person with any degree of Black blood as a Negro and strictly segregated them. IQ scores in Africa (where they are presumably more purely Black) are even lower. As American Blacks are one standard deviation below Whites in IQ (about 85), pure blacks in Africa of equal schooling with Whites -- average about two standard deviations below Whites (below 75) .

Professor Richard Lynn compiled studies in 1991 of IQ in Africa, where there is far less White genetic addition to the Black gene pool than in the United States. He found that sub-Saharan Africa Blacks have an IQ of below 75, which is almost two Standard Deviations below the White norm. By European standards, these figures mean that approximately 50 percent of Black Africans would be classified as borderline mentally retarded or below (almost twice the rate of Blacks in the United States). Since Lynn's review in 1991, three newer studies have confirmed his work. They used Raven Progressive Matrices, a noncultural-specific test that is an accurate measure of the nonverbal part of general intelligence. A Black Zimbabwean, Fred Zindi, conducted one of the studies which compared 204 Zimbabwean 12 to 14 year olds and matched them to 202 English students for sex, educational level, and class background.

Ch. 9: Roots of Racial Difference

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Thinking back on these things, I tried to reduce what I knew to the simplest form. Why does a dog bark and a cat meow? I asked myself. I answered my own inquiry: Because the dog's brain is constructed in a way that makes him bark and behave like a dog, and a cat's brain is built in a form that makes it meow and behave like a cat.

Wanting to expand my theory, I called a friend of mine from school whose family owned a dog kennel and had bred dogs for more than 30 years. He explained to me that different breeds of dogs had distinctly different personalities. Violence, aggression, passivity, loyalty, stoicism, excitability, intelligence --all these things sharply varied in the many breeds of dogs. For example, he explained that the Chihuahua is extremely excitable and hyperactive by nature, whereas the Saint Bernard is stable and stoic. He talked about the natural violent aggression of the pit bull as compared to the naturally friendly disposition of the Golden Retriever. My friend explained why parents of small children often chose a Golden Retriever as their pet because the breed is exceptionally friendly and protective of children. Even when children torment the Golden Retriever, he told me, the breed will rarely respond violently toward them.

I also picked up an interesting little book on the history of dog breeding and found that not only did dogs have distinct personalities according to their breed, but that they were bred by man precisely for those personalities as well as for physical characteristics such as size and color. Any dog trainer would laugh if told that the only difference in breeds of dog is the color of their coats. If a dog's distinct personality characteristics are not created solely by its training, the tendencies must be carried in the structure of its brain.

Armed with my newly gained knowledge, I asked my biology teacher how the classifications of breeds of dogs compared to the classifications of the races of mankind. Taken aback, she told me that she had never been asked that question by any student before, but she said breed and race are essentially two words for the same biological classification: subspecies. All dogs are members of the species *Canis familiaris*, of which there are at least 140 different breeds (subspecies or races). She repeated what I already knew -- that the commonly accepted test for whether two groups were different species or subspecies of the same species was whether they could interbreed. The various breeds of dogs, just as the various races of humans, can interbreed in spite of obvious inherent differences.

Even though she taught biology, which included human biology, she became very uncomfortable equating differences in human races as compared with breeds of horses or dogs. It was as though I had trespassed on forbidden ground, but I saw nothing heretical about the inquiry. To understand those distinctions that separated man from the other species, and to

comprehend the differences in mankind seemed important. How could we begin to understand the world around us without having an understanding of what makes us the way we are?

By then I knew that no fewer than a thousand scientific studies had demonstrated that there was a significant difference in IQ between the White and Black races, that IQ differences have a major impact on individual socioeconomic success, and that ample evidence showed that heredity rather than environment was the major source of this difference.

Black and White Brains: The Facts

Books and articles on IQ led me to other studies revealing that significant differences existed between the brains of Blacks and Whites. In fact, the data on the racial differences in brain structure were even more cut and dried than those based on psychological testing. I found that Negro and White brains have been weighed, compared, and analyzed for decades, and the results have consistently shown Black brains to be smaller than White and Asian brains. As an illustration of the marked difference, even though Blacks are physically far larger than Asians, the latter have physically larger brains.

In *The Mismeasure of Man*, a popular media-touted egalitarian book, Stephen Jay Gould claimed that 19th century researchers used false methodology in comparing White and Black brains, and implied there are no differences. Gould, however, carefully left out many more recent studies that document intrinsic brain differences between Blacks and Whites. In fact, ten years before the publication of Gould's book, *The Mind of Man in Africa* by John C. Caruthers showed that there had been five major studies using a modern methodological basis on Black and White brain differences, by Todd, Pearl, Vint, Simmons, and Connolly. Gould carefully avoided mentioning these more recent studies, except for two brief sentences about Pearl, whom he praised for saying that nutrition might explain the racial difference in brain sizes. Gould conveniently left out Pearl's data on Brain differences. Caruthers points out that a number of scientific studies show that Black brains are on average 2.6 percent to 7.9 percent smaller than White brains.

Simultaneous with Gould's work, a 1980 study of brain weight that included data on Black and White brains showed that Black babies' brains were on average 8 percent smaller and lighter than White brains. In the 1980s and '90s additional studies by Broman, et al, and Osborne have consistently shown significant differences between White and Black brain sizes.

In the 1950s, direct studies comparing White and Black brains came to an end for a while, it being considered impolite, insensitive, and politically incorrect to contemplate such differences. After a long hiatus, a number of more recent studies of brain physiology show the same evidence of differences in brain sizes between Blacks and Whites as was first reported in the last century.

Perhaps the most extensive research of all was done by the National Collaborative Perinatal Project, which studied more than 14,000 mothers and children. The project was national in scope and studied mothers and their children from the time of conception through birth and early childhood. The objective of the study was to discover the main correlates of infant mortality, health, and intelligence and other aspects of child development. Subjects were tested for IQ at ages 4 and 7. Extensive body and head measurements were taken at birth and at 8 months, 1 year, 4 years, and 7 years.

Dr. Arthur Jensen analyzed the massive data from the study and found some startling things. Even within families, the higher-IQ sibling usually had the largest head size. The study also bore out numerous previous studies that had shown Blacks to have smaller heads, on average, than Whites, and corresponding lower intelligence. As a striking confirmation of the correlation between head size and intelligence, the study found that Black and White children who matched closely for IQ had, on average, little difference in head size. 140 If the size of the physical brain correlates with IQ, it makes good sense that intelligence is based on the physical structure of the Brain itself and thus has an inherited component.

Much earlier studies had shown differences in the Supra Granular Region of the brain, differences in the amount of frontal lobe area, and differences in the sulcification and fissionation of the brain between Blacks and Whites. In 1950 Connolly wrote: "The Negro brain is on the average relatively longer, narrower, and flatter than the brain of Whites. The frontal region, . . . larger in male Whites than in Negroes, while the parietal is larger in Negroes than in Whites. . . It can be said that the pattern of the frontal lobes in the White brains of our series is more regular, more uniform than in the Negro brain . . . The White series is perhaps more fissurated and there is more anastomosing of the sulci. . . ."

The importance of the brain's frontal lobes to its owner's personality was highlighted in the films *One Flew Over the Cuckoo's Nest* and also in Jessica Lange's movie on Frances Farmer called *Frances*.

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The Retreat of Racial Egalitarianism

In the racial egalitarian line of defense they have argued that:

1) Blacks are really not less intelligent -- a common popular argument. But when critics point out that hundreds of studies show a consistent and dramatic lower IQ scores for Blacks they allege that:

2) Differences in IQ are the result of racially biased tests. But when proven that they are not racially or culturally biased, they then argue that:

3) Lower average Black IQs are simply the result of socioeconomic factors. But when the differences show up even when socioeconomic factors for Whites and Blacks are matched, they retreat to saying that:

4) Environmental stimulation of young Blacks in programs such as Head Start will bring up the Black children to the White IQ level. But when shown that Head Start resulted in absolutely no increase in Black IQ, they postulate that:

5) IQ really does not mean anything anyway. But when shown that hundreds of social scientists proved that IQ has a tremendous impact on educational and socioeconomic success -- they finally retreat to an egalitarian defense that accepts the biological determination of intelligence: they allege that poor nutrition is responsible for the differences in mental development of Blacks and Whites.

The final egalitarian defense is interesting in that it accepts that intelligence is important and is rooted in the biology and formation of the brain itself. Instead of trying to dispute the natural role of genes in the architecture and development of the brain, the egalitarians simply argue that nutrition and other biological factors of the mother and of the young child dramatically affect the brain's development. They argue that Blacks, because they are poorer than Whites, are nutritionally deprived and thus held back in the development of their brains.

European children who grew up in the starvation of central Europe, during the stress and starvation at the end and right after the Second World War, show no ill effects in lower IQ. Their IQ average compares favorably with both the period before and after the conflict.

The scientific studies of nutrition show that there is little difference between the nutrition of Black and White children Robert Rector showed in a survey by the U.S. Department of Agriculture that Black preschool children actually consume more protein than do average White children. Children in families 75 percent below the poverty line actually consume as much of the major vitamins as children 300 percent above the poverty line.

The argument that the brains of young Blacks are malnourished is almost laughable when one looks at the absolute Black domination of track and field, basketball and football. It is hard to imagine that the same nutrition that enables Blacks to develop nutritionally healthy bodies that help make them 15 times per capita more represented than Whites in these major sports, has during the same time period--starved their brains!

Racial differences also are obvious in the physical realm. In the 1960s Blacks dominated the male sprinting events of the Olympics and, with integration of sports, they were rapidly increasing their numbers in professional basketball and football. At this writing Blacks now make up approximately 80 percent of the National Basketball Association, 66 percent of the

National Football League, and 100 percent of the top 50 male sprinters in the world who compete in professional and Olympic 100- and 200-meter dashes. This is true although well-organized track and field is much more prevalent in White nations than Black ones and although there are far more White high-school athletes.

Some have suggested that Black overrepresentation in basketball comes from greater desire on the part of Blacks as compared to Whites. Certainly, there are just as many young Whites who desire the multimillion-dollar income and popularity of the professional basketball player, but a Black person is 29 times more likely to be in the NBA than is a White. It seems logical that the differing performance of Whites and Blacks has an anatomical and physiological basis. Scientists who have investigated the issue say precisely that.

There are numerous physical distinctions between the White and Black race. Blacks have greater proportions of muscle types that favor quick bursts of speed than Whites do. They also have less body fat, smaller body cavities, longer arms in relation to their height, and numerous other differences that contribute to their excelling in sports that favor quick bursts of speed as well as jumping ability. They are favored in sports where those traits are the most important and have a disadvantage where strength and other characteristics are favored. Whites and Asians dominate the strength sports of weightlifting and gymnastics and the higher density in Blacks' bones results in less buoyancy and a distinct disadvantage in swimming and other water sports.

Ch. 10: The Evolution of Race

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One interesting publication I read was the Psychological Bulletin I found a couple of articles from the early '60s that discussed how Blacks tend to be more impulsive and unrestrained than Whites. Dreger and Miller called some of the Black personality traits "estrangement and impulse ridden fantasies."

In later years, numerous articles detailed other Black personality differences. An extreme liberal, Thomas Kochman, noted clear racial distinctions in personality between Blacks and Whites, and he expressed his preference for black characteristics. He argued that Black males perceive being ignored as the highest insult and recommends that White women should react to Black sexual aggression with sassy rejoinders just as Black women do. He even went so far as to suggest the typical non-black behavior style of White women caused violent Black male attacks.

Kochman also noted that blacks have "intense and spontaneous emotional behavior" and that the Black "rhythmic way of walking" is "a response to impulses coming from within." He criticized White debating techniques as "low-keyed, dispassionate, impersonal and non-challenging. . .cool, quiet, and without affect," while he describes the Black approach to argument as

"animated, confrontational,. . ."heated [and] loud..." and that Blacks argue not simply the idea but the "person debating the idea."

After personally experiencing the Black style of argument on many occasions, I had to agree with Kochman's evaluation. However, I dispute his notion that such primitive and emotional behavior enriches our culture. After I read Kochman, I noticed the frequent news reports of Black males who argue in precisely the way he described, "heated, confrontational and loud," leading them to impulsively use their Saturday Night Specials. Our public hospitals are full of the victims of such heated and unrestrained Black styles of argument.

Many studies showed the greater levels of impulsiveness, aggression and emotionalism in Blacks as compared to Whites. A study that took place in Trinidad compared Blacks and Caucasian immigrants from India. Walter Mischel conducted a study of children in Trinidad in which he gave White and Black children the choice between a candy bar immediately or a larger one a week later. Blacks almost always chose the immediate gratification while Whites usually chose to wait for the bigger reward. The inability of the blacks to delay gratification was so great in comparison with Whites, that Mischel stated that measuring it seemed "superfluous." Mischel also tried to compare the familial patterns of the blacks who almost always had female-headed households to the East Indian households, but he could not find enough East-Indian households with absent fathers to constitute a statistically meaningful study.

Other books such as *The Unheavenly City Revisited* by Edward Ban-field noted that inner cities' inhabitants, that include many Blacks, have less tendency to defer gratification, and an extreme orientation to the present. 168 169 Most of the men who noted these psychological differences between the races took for granted their cultural origins, but many new studies reveal that such tendencies had hereditary implications.

One of the more interesting aspects of the study of criminal behavior I learned about was its links with testosterone. Researchers have long noted that males are about ten times more often found guilty of violent crimes than are women, and high crime rates coincide with high levels of testosterone in adolescence. Criminal youths are also found to have higher average levels of testosterone than non-criminals of the same age. Interestingly enough, young Negroes are found to have significantly higher levels of testosterone than do young Whites. The Black crime rate is about 300 percent higher than that of Whites on a world-wide basis.

Higher levels of testosterone could contribute to greater sexual aggression as well, contributing both to rape and assault of women as well as instability in relationships. It is also easy to see how it could damage the family. In my reading, I learned that in Africa as well as in every New World Black society, illegitimacy and promiscuity is far more common than in European societies. In the United States, for instance, the African-American illegitimacy rate is fast approaching 75 percent of all newborns.

The chronic social problem of absent Black fathers in America is found repeated on a world-wide scale. In a research paper on African marriage systems, Patricia Draper describes the parenting role of Negro fathers in Africa and the Americas: "The psychological, social, and spatial distance of husbands/fathers, together with their freedom from direct economic responsibility relieves them of most aspects of the parental role as Westerners understand the term."

I wanted to understand the reasons why the Black differences existed. That meant a look into the evolutionary aspects of the formations of the major races. But, before I did that, I had to answer a more pertinent question Ashley Montagu maintained in his books and articles that Race is simply a cultural myth. In recent times this view has been parroted frequently in the media. Is race real, or is it a socially-contrived invention?

The Reality of Race

Ashley Montagu's, *Man's Most Dangerous Myth: the Fallacy of Race* had impressed me before I began my look into the other side of the scientific studies on race. The "myth of race" position is essentially that skin color, hair type and other traits that influence racial classification are completely arbitrary traits of mankind and are as unimportant as are different types of fingerprint designs.

After almost thirty years of the media proclaiming the "myth of race," race-critic Jared Diamond refined the argument in the 1994 issue of the very popular *Discover* magazine. Diamond chose a few traits such as lactose intolerance and fingerprint patterns that varied geographically among human populations and suggested by those traits alone, Swedes could be put in the same "racial category as the Ainu of Japan or the Xhosa of Africa. He asserted, therefore, that racial classification was nonsensical. Another media-popular disclaimer of race is Cavalli-Sforza, who in the preface of his major work, *The History and Geography of Human Genes*, gave lip-service to the argument of Diamond and Montagu. Interestingly enough, when one looks at Cavalli-Sforza's world gene-distribution maps in his book, they show the same geographic boundaries that reflect the traditional racial groupings.

I had realized back in the 1960s that the "myth of race" argument is perfectly analogous to saying that the dozens of different breeds of dogs is a myth because one can find some specific traits that exist in varying breeds. I thought about the question long and hard, and I asked myself, "Because some similar traits are found in different breeds of dogs, does that mean that there are no St. Bernards or Chihuahuas?"

If Ashley Montagu were attacked by a dog, I think it might matter to him if the dog were a Doberman Pinscher or a Toy Poodle. As the Doberman began to chow down on him, would he still insist that the differences among the breeds of the canines don't exist? Even Montagu could predict that a Doberman offers a great deal more potential danger than a toy Poodle. If Diamond

wants to be technical about it, many human traits and sets of traits, can be found that exist in other mammals. In fact, humans share 98.5 percent of their genes with Chimpanzees. If one follows Diamond's rationale, there is no difference between humans and Chimpanzees because we can find sets of selected genetic traits we share.

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In Africa, although there could be advantages for a woman if the male helped provide for her, it was not nearly as important to her survival. Surveys of Blacks worldwide show that Black males and females begin sexual relations earlier, have more sexual partners, more frequent sexual relations, more absent fathers, more polygamy, higher testosterone levels in males, more prominent secondary sexual characteristics, and much higher rates of sexually transmitted diseases. For instance, even in the United States, African-Americans are 50 times more likely to have syphilis, and in some areas, an incredible 100 times greater likelihood of gonorrhea. Blacks are 14 times more likely to have AIDS than are non-Hispanic Whites. "I don't think there is any question that the epidemic in this country is becoming increasingly an epidemic of color," said Surgeon General David Satcher.

Physical Manifestations

In colder climates, strength and endurance became the deciding physical factors for survival rather than speed. Men had to be strong enough to build complex and heavy structures of wood or stone, or sometimes even of ice. It made more evolutionary sense for the European to have a bit more insulating body fat and a larger body cavity than Africans, as such helps protect the body from times of intense cold. Africans having a lower percentage of body fat, arms and legs proportionately larger to body size, smaller body cavities, and smaller heads --helps make them more efficient in running, jumping and fighting.

In the modern world, Black domination of boxing illustrates the physical differences created by the differing evolution of the races. Soon after Blacks were permitted to participate freely in the organized sport, they quickly asserted their superiority in it. Black athletes have muscle types that can provide quick bursts of speed, while Whites tend to dominate sports that require maximum strength and endurance. Weightlifting, for example, is overwhelmingly dominated by Europeans and Asians.

When I was looking into the evolutionary questions, one of the most heavily-promoted sporting events in history was the Mohammed Ali, Chuck Wepner fight. I remember the statistical differences to this day. Wepner stood six foot six inches in height, but interestingly, Ali, who stood three inches shorter, had a reach that was six inches longer. Wepner however, was much stronger and could lift dramatically heavier weights than Ali. It became obvious in the fight that although Wepner had a tremendously powerful blow, Ali's speed allowed him to simply strike, bob, weave and dance around his slower European-American opponent. Despite Ali's

evolutionary advantage, in a courageous effort, Wepner lasted 15 rounds with Ali, and inspired the Rocky movie series based on his character. I was probably the only one in the neighborhood who thought about the evolutionary racial differences between Ali and Wepner as the replay of the fight came on TV.

The Roots of Higher Intelligence

In an extremely cold and inhospitable natural environment higher human intelligence is dramatically favored. Europe demanded a higher technology for survival. If a society depends almost wholly on hunting, development of advanced weapons, traps and sophisticated strategies can be critically important when there is scarce game. Effective hunting, fishing and trapping in such an environment can demand well-developed cognitive skills. The invention and rigging of ingenious traps can demand high intelligence. The skills and the tools necessary to make a fire, no easy task in a cold wet environment, can mean the difference between life and death. If a heavy shelter constructed to keep out winter collapses on its occupants because of poor design, they could well die. In equatorial Africa, if the leaves or straw huts blow away in a rainstorm, the occupants can just build another one tomorrow. If a native gets lost in the rain forests of Africa, he can live on the fauna and flora while he finds his way back, while if the European gets lost in winter he could freeze to death.

A number of writers on European prehistory believe that navigating on long winter hunts with nondescript landscapes, favored

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In Europe, the prehistoric economy found dependence on several primary animals. Probably the most important were the mastodon and the various breeds of deer and reindeer. Now extinct, the mastodon was the largest animal ever to walk the Earth contemporaneous to man. A great hairy beast adapted to the cold temperatures of Europe and Northern Asia, it stood about twice the size of the great African Elephant, had huge tusks and was easily strong enough to lift weight equivalent to a small automobile. To hunt such creatures demanded technologically-effective weapons, as well as effective teamwork and planning. Much of the prehistoric economy of Europe found its base in products harvested from the Mastodon. Meat and fat, thick skins for clothing, shoes and shelter, bone and sinew for weapons and tools, oil for their lamps, organs used for thread and containers --the Mastodon provided all these products and more. Obviously, it was hunted exclusively by males. The same was true for deer and other game.

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The Evolution of Races

To understand the evolution of the races, I found it instructive to understand the genetic

development of dogs. All dog breeds are members of the same species, *Canis familiaris*, just as all humans are members of the same species *Homo sapiens*. We call the different varieties of dogs breeds, and we call the different varieties of humans, races, although breed can also describe human varieties. The only difference in the two terms is that breed usually denotes genetic selection by humans, while races denote genetic selection by the forces of the geographic environment.

Selective breeding from a single species created the spectacular variety of dog breeds over a relatively short period of time, perhaps only five or six thousand years. Humans selected dogs for certain physical and personality traits, segregated them from other dogs and created the vast differences in dog breeds we see today. Before the c of the Black and White race as we know it, mankind's remote ancestors fanned out around the globe. The populations encountered vastly differing environments that selected for many characteristics, the most readily recognizable being the physical traits of skin color, hair texture and color, and eye color.

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In Africa, numerous kinds of edible vegetation existed, as well as small rodents and insects and other varied and abundant food sources. By contrast, the ground in Europe was a frozen sea of snow and ice for many months each year and even many trees had no leaves. In the mildest of months, the inhabitants had to prepare for the harsh periods by deferring gratification and putting aside stores of food and supplies. In such cold climates, hunting large game rather than gathering edibles became the chief source of food and supplies. Because hunting provided most resources, females and children became dependent on male provisioning, leading to a strong bond between men and their immediate family. In both Europe and Asia men had to provide for their mates and children if they were to survive.

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As the years passed, egalitarianism became the dogma of our times. Not only did many of the evolutionary anthropologists become egalitarians, but so did many creationists. Today, a common attitude among creationists is that God made us all the same. In reality, though, the creationist viewpoint shows God is the architect of race. For if one maintains that God made Nature and humanity as it is, then it must be conceded that he created the distinct races; gave them different features, behavioral tendencies and mental abilities. Furthermore, he segregated them from each other on different continents. From a thoughtful creationist viewpoint, to deny the reality of race and racial difference is a denial of God's own handiwork.

The reality of race is also reinforced by the Holy Bible. If the creationist uses the Old Testament as his guide to creation and as his guide to God's view of race, it is quickly apparent that the Old Testament is in fact a testament of race. It is a history of one people: the Israelites, in continuous conflict with the differing racial groups of the Middle East region. It emphasizes their own

genealogy and the repeated commands not to mix their seed (an equivalent of the scientific concept of genes) with others. I have much more on this in the Race and Christianity chapter, but whether one takes the evolutionary or the creationist view, both support the reality of race.

I found it amazing to see how the mass media was able to convert both the scientific community -- which espoused evolution and the fundamentally opposed creationist community -- into spouting almost an identical egalitarian dogma. Their victory was complete by the time I graduated from high school.

The intellectual, secular community branded anyone who dared to publicly promote the idea of racial differences -- as unscientific. Anyone in the religious community who dared to tell the truth of race was accused of being against God himself. Egalitarianism had become a de facto religion, incorporated under both the name of science and religion. Simple recognition of racial differences became a moral sin equivalent with adultery or perhaps even murder. But the racial heretics have not gone away quietly, and with each passing day more evidence emerges of the dramatic, genetically-borne, physical and psychological differences between the races. The same is true of the differences between the sexes. Today, the idea of ingrained psychological, brain-originated differences between men and women has become widely accepted among society. (See the Sex Differences chapter.) Tomorrow, the same will be true of race.

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Aside from considerations of evolutionary fitness, it is natural for all races to prefer the company and aesthetics of their own race. I love the look and the spirit of my people, in our fair-skinned, light featured, esthetic prop we find our own concept of beauty. Whether it is the Norse-like God and Adam of the Sistine Chapel or the perennial blonde, angel-like prototype of beauty revered the world over, our race needs no justification to seek its own survival. For that matter, no race does.

The way that evolutionary fitness is ultimately decided is in evolutionary success. Right now our people seem hell bent on letting their genotype be extinguished from the planet, even in our own homelands. . . . Race suicide could also be hastened when a race allows massive immigration of an alien race into its society and the loss of genetic survival through racial intermixture. In promoting the idea of my own racial survival, I understand that all races share that same goal. If I were an African, I doubt that I would care about evolutionary gradations and where my people would rank on the charts. I'd love my own and everything that is unique about my own. An African can only be inferior in things that he is not good at, and he can always be superior in what he is born to do. If the destiny of the Black race is to live closer to the natural world, so be it. Whatever fate he seeks, it would be a destiny he would carve for himself by his own hand.

Fear of Extinction to Dreams of the Heavens

Once I had the idea that our race was vital to the evolutionary progress of mankind, a whole new perspective dawned on me. The appreciation of ecology that I gained as a very young man in the swamps and forests of south Louisiana, now helped me to fully understand how mankind is an integral part of that ecology. Understanding race is simply an understanding of what Garrett Hardin calls, "human ecology."

Not only is it not immoral to recognize the realities of race, there is no higher morality existing, than to work for the survival of your own kind. Is it not ridiculous for some of our people to work hard to preserve the unique breeds of Whales around the world while they denounce those who seek the preservation of the unique breeds of humanity? Furthermore, I realized that the high moral qualities that inspire the egalitarians were in fact created by the same race that they are so intent on dissolving into interracial soup. Do not the high morals that they tout come from the highest ideals of civilization and culture, ideals created by the European people?

Breeders of thoroughbred racehorses would be horrified to see the lines so carefully matched for speed over centuries to be randomly interbred out-of-existence with horses who could only run half as fast. Imagine if there was only one last pair of thoroughbreds on Earth. Wouldn't people do everything they could to preserve that magnificent breed of horse? Our people have been the thoroughbreds of civilization; do we really want to destroy our genetic distinctiveness, the unique heritage that has produced so much beauty on the Earth?

The opponents of racial awareness constantly parrot the idea that it is hateful and barbaric to be racially conscious, and for a White person it is said to be downright evil to desire the preservation of our own racial integrity. But, how morally supreme is the racially-mixed Black and Brown world as compared to the European World. What areas of the globe have the most brutal crime including rape, assault, robbery and murder? Which races have more concern for human rights and justice? Which races more frequently have political freedom, and among which races is despotism more prevalent? Which have better medical care for the sick and afflicted and had more concern for them? Which have more educational opportunity for their children? Which have more opportunity and fairer treatment of women? Which race leads our adventures into space? Where is the compelling evidence that the demise of the White race is really going to produce more humanitarianism, more love, brotherhood and all the catchwords of the egalitarians? Do the six thousand murders a year in racially amorphous Rio De Janeiro somehow represent a moral example to the rare murders in the more racially homogenous Tokyo, Japan or Berlin, Germany?

The racial egalitarian arguments remind me of how I had learned the Communists promised freedom and equality to the Russians and other Eastern Europeans, but instead created great slave nations. I came to believe by the tender age of 15 that if I truly wanted a society capable of the love and decency that the egalitarians so value, that I had to preserve my genotype. It also became apparent that our people's right to preserve our heritage and people is perhaps the most

basic right of all, the right to live.

Since I was a small boy, the media had pounded in my mind that the most terrible act of the 20th century was said to be the attempted destruction of the Jewish people during the Second World War. An attempt to wipe out a race would be an execrable crime in anyone's mind. In fact, commentators said that what made the atrocities against the Jews so terrible was not the murder of such great numbers per se, because there had been bigger slaughters in Russia and China, but the fact that there was an alleged attempt to wipe out the Jewish people. Yet, why is not the eventual destruction of our European genotype, the genocide of our race, any less terrible than that which was said to be attempted against the Jews? The ultimate result is the same.

As I recognized the genetic crisis we faced, I also became inspired with the possibilities for our people. If the genetic improvement of our race created by the ice ages, produced such great achievements, then nurturing our genetic quality offered great hope for the future. The environmentalists, whether they be Capitalists or Communists, Democrats or Totalitarians say that the way to better the world was through better mechanisms of society. In fact, all of man's

history has been about man's progress through the tools he created. The crucible of the ice ages created a genetically brilliant people that in spite of having no written language, no schools, no domesticated animals, no complex architecture, eventually created these things out of nothing. If the behavioral environmentalists were right, prehistoric man could have never built the first civilization, for his environment was far too primitive and uneducated to have ever afforded such an opportunity. Our heritage created civilization from nothing but the genetic powers carried inside of them. The achievements of the European people can be contrasted to the centuries the African race has not even been able to copy successfully what Europeans originated. The great treasure our people possessed has always been in our genes rather than our gold or our gadgets.

The Great Paradox

While still in high school I read Elmer Pendell's classic book *Sex Versus Civilization*. Pendell was a population expert who had written many books on the perils of overpopulation. He pointed out that you couldn't properly deal with the human quantity problem without addressing the human quality issue. He also made clear the strange interaction of human evolution with civilization, which I call the Great Paradox. He said that the ice ages produced the magnificent intellectual powers of what we call modern or "Cro-Magnon man," the prototype of the modern European. As the ice ages receded and the climate became less harsh, those genetically accumulated abilities flowered in the world's first great civilizations. Over time, intellect combined with accumulated learning brought on the highest cultural and technological achievements. Ironically, at the same time civilization makes advancements, it fosters a dysgenic selection that in many ways is opposite to the eugenic effect of the prehistoric period.

The same sharing and social justice that helped the small hunting bands of high quality to survive, applied indiscriminately to a larger society, leads to degeneration. The least intelligent and fit reproduce faster than the best. As the most intelligent found their pleasure in their business, religious, governmental activities, as well as the arts or the various pleasures that could be purchased with affluence, they had smaller families. The poorest continued to find their greatest pleasures in the sexual acts that also increased their numbers.

The organization of civilization also meant a change in the conduct of wars. In more primitive societies, warfare could wipe away the whole gene pool and replace it with more intelligent and efficient groups. Civilization's wars tended to leave the physical and mental defectives at home, while impressing the healthiest, and fittest, who by virtue of their youth had often not yet had children. Through a succession of wars, the best and bravest traditionally led their troops and suffered the highest casualties.

As civilizations increased in power, they ranged in conquest far beyond the original boundaries of the people who built them, they sometimes brought back slaves of the conquered peoples, such as the Egyptian transport of Nubians into the heart of Egypt. Often, the genes of those non-civilized populations were slowly absorbed into the conqueror's gene pool.

Unwanted Births and Dysgenic Reproduction in The United States

by Marian Van Court

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Most people are surprised to discover the prevalence of unwanted births in this country and the extent to which they are inversely related to intelligence and educational level. Approximately one-fifth of the births between 1960-1965 in a U.S. sample were said by the parents to have resulted from unplanned, unwanted pregnancies; two-fifths of the remainder were also accidental, but claimed to have been intended for some future time (Bumpass and Westoff, 1970). These figures tend to underestimate the total percentage of unwanted births because there is "considerable rationalization" in parents' reporting, and because illegitimate births are not counted.

In this same study, the incidence of unwanted births was negatively related to both educational level and income. The proportion was twice as high among wives with less than a high school education compared to that of wives with at least some college (26% vs. 13%). The proportion was twice as high for families with incomes under \$3000 than for families with incomes over \$10,000. For every category of education and income, the percentage was higher for blacks than for whites. For blacks as a whole, more than one-third of the births to married couples were unwanted (Bumpass and Westoff, 1970).

During the 1970's, there was a dramatic increase in usage of the most effective birth control methods-"the pill", the IUD and sterilization (Westoff & Ryder, 1977). In 1976, unwanted marital fertility had declined to 12% (USDHEW, 1980). But the rate of illegitimate births (most of which could be presumed to be unwanted) had more than tripled since the early '60's. By 1979, 9% of white births and 49% of black and "other" births were out-of-wedlock (Bureau of the Census, 1979). Significant differences by education and income remained. Part of the problem is that those of low educational level are less likely to use contraception. Yet even among a sample of women using the same highly-effective methods, those with lower IQs were found to have much higher failure rates. Percentages having unwanted births during a three-year interval were 3%, 8% and 11% for high, medium and low IQ women, respectively. For those not using one of these methods, the percentages were 15%, 23 and 31% (Udry, 1978). After an unwanted pregnancy has occurred, higher IQ couples are more likely to obtain abortions (Cohen, 1978). Unmarried teenage girls who become pregnant are more likely to carry and deliver a baby than to have an abortion if they are doing poorly in school (Olson, 1980). Thus each factor--from initially employing some form of contraception, to successful implementation of the method, to termination of an accidental pregnancy when it occurs--involves selection against intelligence.

A pathbreaking study by Vining (1982) has reported a negative correlation between fertility and intelligence for a large, representative sample in the U.S. aged 24-35 as of the late 1970's. My own research (Van Court, manuscript in preparation) has replicated Vining's results on a broader age range. Unwanted births undoubtedly make a contribution to this dysgenic trend, although no study (to my knowledge) has yet precisely quantified their impact.

Fertility studies usually include information about socio-economic status and educational level, which can be used as proxies for IQ, but are not ideal measures. As mentioned above, there are problems with reluctance of parents to admit to contraceptive failures, which introduce unreliability into calculations of unwanted births. Perhaps the main impediment has been the environmentalist milieu of the past several decades which has relegated vital research questions such as these to a not-entirely-benign neglect.

Despite the unfortunate lack of exact figures on the effect of unwanted births on the dysgenic trend in the U.S., inferences can be drawn from various data which indicate the impact is substantial. Several studies which reported the usual negative correlation between number of children and educational level and income found zero correlation, or even a tiny positive correlation, when only planned families were analyzed (Kiser and Whelpton, 1953; Freedman and Slesinger, 1961).

As an aside, it should be mentioned that while a great deal of attention has been paid to "excess fertility" and its implications for the problem of overpopulation, very little attention has been paid to the opposite problem of "deficit fertility". It was first analyzed by Weller and Chi (1973), and again on a larger sample by Weller (1974), who found that 18% of American women said they desire more children than they expect to have. Highly educated women were more likely to fall into the "deficit fertility" category. The reasons for this definitely warrant closer examination. Weller also found the usual negative relationship between the wives education and unwanted births.

Prevention of unwanted births could well be considered a worthwhile humanitarian goal in itself, aside from its important eugenic consequences. A great deal of individual human misery could be alleviated for parents and for children if only planned births occurred. Unwanted children are reported to be more often subjected to neglect and physical abuse, and to suffer more frequently from emotional problems (Lebensohn, 1973). Prevention of unwanted births would yield collective economic benefits as well--the number one cause of dependence upon Aid to Families With Dependent Children (AFDC, the largest category of welfare) is accidental, unwanted births (Bogue, 1975; "Unplanned Pregnancy...", 1981). For many people, a major reluctance to confronting the crucial question of the current direction of human evolution stems from an uncomfortable suspicion that it might well be unfavorable, and from the allied conviction that if indeed the evidence proves we are deteriorating genetically, no morally and socially acceptable solutions exist. An almost primitive fatalism and superstition underly the assumption that as a society we are utterly powerless to alter our course, however disastrous a

legacy we may be leaving future generations through our negligence, and the irrational fear that if we dare attempt to guide it (or even if we think about it too much!) we run a grave risk of being suddenly forced against our wills through some mysterious, outrageously implausible yet inexorable sequence of events culminating in genocide and World War III. I am pleased to report that this need not be the case!

The fact that some substantial portion of current dysgenic reproduction is attributable to unwanted births points squarely to a set of remedies which would be acceptable to most people, both morally and socially: 1. greater efforts in the area of sex education for adolescents, 2. increased availability of permanent birth control methods for couples who have achieved their desired family size, and 3. most important, more equal access to abortion as a safety net when other methods fail. "More equal access" necessarily means liberalization of abortion laws and government support for those who want abortions but can't afford to pay for them. It seems most improbable that the vociferous "Pro-Life" faction will ever succeed in totally banning all abortions against the desires of the majority of Americans. Therefore, abortions must be equally obtained by all segments of society unless they are to act as a selective agent. At present, abortions are more readily obtained by those with money, education, intelligence and initiative. Thus the effect is to decrease our genetic potential for these and associated positive traits. Ideally abortions would act automatically as a selective agent in a eugenic rather than a dysgenic way. Since women of low IQ fail more often with birth control and thus have more unwanted pregnancies, if all women with unwanted pregnancies had abortions, this would neutralize the dysgenic effect of birth control failure. Few political conservatives (or liberals, for that matter) are actively searching for more government programs on which to spend taxpayers' dollars. But the alternative in this case--even viewed solely from a short-term standpoint--is even worse. It is obviously far more expensive for a woman on welfare to deliver a baby than to have an abortion, not to mention the costs of supporting the child for 18 years.

In Japan, where eugenic considerations are written into law, abortions are easily obtained and are very inexpensive (Muramatsu, 1967). As a consequence, obtaining one does not present an insurmountable obstacle to the unintelligent, the uneducated, the extremely passive or the indigent. If this became the situation in the United States, if the slogan "Every child a planned child" became a reality, it could go a long way towards eliminating the unhealthy negative relationship between intelligence and fertility which now exists.

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Dysgenics: Genetic Deterioration in Modern Populations - A Review

by Richard Lynn - Praeger, 1996 237pp., \$59.95 1-800-225-5800 (for 20% off mention F238)
reviewed by Marian Van Court

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Countless volumes have been written about the past evolution of the human species, yet hardly any attention has been paid to the crucial question, "Where are we evolving now?" Richard Lynn, of the University of Ulster in Northern Ireland, courageously addresses this question in his controversial book *Dysgenics: Genetic Deterioration in Modern Populations*. Professor Lynn presents compelling evidence that much of the world is deteriorating in its genetic potential for intelligence, health, and conscientiousness (or good character). The word for this is "dysgenics," the opposite of "eugenics."

The Bell Curve devoted one chapter to the question of where we are evolving with regard to IQ (Herrnstein and Murray, 1994). *Dysgenics* picks up where *The Bell Curve* left off. Professor Lynn surveys studies from all over the world, and everywhere finds the least intelligent people having the most children. The only exception is sub-Saharan Africa where contraception is rarely used. Our genetic potential for intelligence has been declining in Europe and North America since the mid- 1800s, with a total loss of about 5-8 IQ points. Currently, we are losing almost one IQ point each generation.

The decline in genotypic intelligence coincided with the dissemination of information about contraception. For several centuries prior to 1800, married couples had natural fertility, essentially uninfluenced by efforts to limit it. During this period, there was a strong taboo against sex outside of marriage, and many people never had children because they were too poor to marry.

Illegitimacy was rare. Infant mortality was high, especially among the lower classes. Harsh though it may have been, natural selection operated to maintain a healthy population, and to keep intelligence gradually increasing.

Then in the early 1800s, several books on contraception were published. These ideas naturally affected the reading classes disproportionately. Goodyear perfected the vulcanization of rubber, making it an ideal material for the mass production of condoms and diaphragms. By the middle of the century, it was becoming apparent that educated people were having fewer children than the uneducated. Charles Darwin worried about the fact that "the scum" of society were so prolific, and expressed deep concern about the future of civilization because natural selection had ceased to operate. Darwin's cousin, Francis Galton, coined the term "eugenics," and was its

main proponent:

The chief result of these Inquiries has been to elicit the religious significance of the doctrine of evolution. It suggests an alteration in our mental attitude, and imposes a new moral duty. The new mental attitude is one of a greater sense of moral freedom, responsibility, and opportunity; the new duty . . . is an endeavour to further evolution, especially that of the human race.

Man is gifted with pity and other kindly feelings; he has also the power of preventing many kinds of suffering. I conceive it to fall well within his province to replace Natural Selection by other processes that are more merciful and not less effective. This is precisely the aim of eugenics. (Blacker, 1952). In the early decades of the 1900s, eugenics societies were being formed in Great Britain and the United States, and eugenics was advocated by leading thinkers along all points of the political spectrum. H.G. Wells summed up its common-sense appeal: "It seemed to me that to discourage the multiplication of people below a certain standard, and to encourage the multiplication of exceptionally superior people, was the only real and permanent way of mending the ills of the world. I think that still." Julian Huxley described eugenics as "of all outlets for altruism, that which is most comprehensive, and of longest range" (Van Court, 1982).

Eugenics made sense because few doubted that heredity was important. Life was more closely tied to the land, and farmers knew from experience that plants and animals vary widely depending on their inborn qualities. Common sense dictated that human beings, like all the rest of nature, are strongly influenced by heredity. In addition, most people had larger families back then. If a couple had many children, all of whom turned out good except one, it was perfectly reasonable to think that what accounted for the difference was inborn, especially if there were signs from early childhood. Since all the children grew up in the same house, with the same parents, eating the same food, it was just a matter of common sense.

Common Sense Confirmed by Science

Professor Lynn's major thesis in *Dysgenics* is that scientific evidence has proven the eugenicists were absolutely right in their concerns about genetic deterioration, and that we, as a society, have made a serious mistake by discounting them. Twin studies and adoption studies have established beyond any doubt the important role of heredity in determining IQ. Identical twins separated at birth have quite similar IQ's. When adopted children grow up, they resemble their biological parents more closely than their adoptive parents in IQ. Just as the eugenicists assumed, social mobility over centuries has produced a social class gradient for intelligence, and social class is determined partly by innate intelligence. One U.S. study found that in families with 2 or more brothers, the boys with higher IQ's tended to move up the SES ladder when they grew up, whereas those with lower IQ's tended to move down. Finally, the evidence shows we are deteriorating genetically because the most intelligent people are having the fewest children.

A number of recent studies point to contraceptive practices as the key to understanding dysgenics today. People with low IQ's, whether married or unmarried, are less likely to use any form of birth control. Among women using the same birth control methods, those with low IQ's have much higher failure rates. After an unwanted pregnancy has occurred, low IQ couples are less likely to obtain abortions. Thus each factor selects against intelligence. One minor contribution to dysgenics is the fact that high IQ women often end up not having as many children as they would have liked to have had. By the time a baby is "convenient," it may be too late. However, the major reason for the decline in our genetic potential for intelligence is greater birth control failure on the part of low IQ women. In the United States, women of all IQ levels report that they would like, on average, about 2.3 children. But low IQ women frequently have more children, often far more children, than they would ideally like to have. If all women had exactly the number of children they desired, there would be no dysgenics, and we would at least break even in our genetic potential for intelligence (Van Court, 1983).

The loss of a 5-8 IQ points may not be a tragedy for an individual, but when applied to a population, it has profound consequences. As readers of *The Bell Curve* may remember, small shifts in the average of a bell-shaped distribution produce large effects on the tails--in this case, the retarded and the gifted. For example, a decrease in the average IQ of just under 5 points doubles the number of retardates (IQ less than 70), and cuts in half the number of gifted (IQ over 130). Furthermore, Herrnstein and Murray found that when they moved the average IQ down statistically by just 3 points, from 100 to 97, all social problems were exacerbated: the number of women chronically dependent on welfare increased by 7%; illegitimacy increased by 8%; men interviewed in jail increased by 12%; and the number of permanent high school dropouts increased by nearly 15%.

One anomalous finding known as 'the Flynn effect' adds an element of mystery to this picture. James Flynn, political scientist from New Zealand, has reported "massive gains" in IQ in the U.S. and elsewhere. When IQ tests are standardized, people consistently find earlier versions of the tests easier, and score higher, than did the original test-takers. There's no consensus on whether this is due to actual increases in intelligence, or some sort of artifact. Certainly, enormous gains are difficult to reconcile with casual observation and declining SAT scores. Many people dismiss 'the Flynn effect' on the grounds that if the population had actually gained 3 points per decade since 1932 as claimed, "Our ancestors would have been morons." Flynn himself is not unsympathetic to this view. Christopher Brand makes a convincing case that people have merely become more savvy test-takers over the years (Brand, 1996). Professor Lynn believes the gains are real, and probably due to better nutrition, which is thought to be the cause of comparable increases in stature. He likens the situation to poorer quality seeds given ever greater quantities of fertilizer. But even if his optimistic view proves to be correct, there should soon be a limit to how much more benefit can be derived from nutrition, if the limit hasn't been reached already.

Decline in health and conscientiousness

Throughout our evolution, the weak and diseased died young and didn't pass on their genes. Now, because of modern medicine, people with numerous genetic diseases live long enough to reproduce and transmit defective genes to their children. (Examples: cystic fibrosis, hemophilia, diabetes, pyloric stenosis, various heart defects, thalassemia, phenylketonuria, and sickle cell anemia.) The incidence of many of these disorders is doubling or tripling each generation. No one would deny sufferers treatment, but it's important to realize that, as a result of it, our genetic potential for robust good health is declining. Life-long care will require ever-increasing expenditures. Furthermore, while sufferers are grateful for medical advances, most would nevertheless be quick to point out that the quality of their lives would be far better if they'd never inherited a disease in the first place.

Conscientiousness, traditionally known as "good character," consists of honesty, a strong work ethic, and concern for others. Since IQ is positively correlated to a number of desirable traits (such as altruism, anti-authoritarian attitudes, and middle-class values of hard work, thrift, and sacrifice), when IQ declines, so do these traits. People with low IQ's are far more likely to become criminals, so the fact that our genetic potential for intelligence is declining means our genetic potential for crime is increasing. Moreover, some evidence suggests that despite lengthy sojourns in jail, criminals still manage to procreate at a faster rate than the rest of us. Professor Lynn's research on London criminals found they had nearly twice as many offspring as non-criminals, and those figures are almost certainly underestimates. In demographic studies of fertility, the entire category of underclass males is frequently omitted because reliable data on their offspring simply can't be obtained--their sexual behavior is often promiscuous, and their relationships transient. Since twin studies and adoption studies have established that there is a substantial genetic component to criminality, the higher fertility of criminals significantly increases the genetic potential for criminality in the population.

What to do?

The solution to genetic deterioration in intelligence, health, and conscientiousness is not a matter of knowhow or resources. Rather, it's a matter of overcoming the pernicious association of eugenics with Nazi genocide. This association has made eugenics a taboo subject, and prevented most rational discussion of it for at least the past few decades. Previously I have addressed this issue:

An almost primitive fatalism and superstition underlie the assumption that as a society, we are utterly powerless to alter our course, however disastrous a legacy we may be leaving to future generations through our negligence, and the irrational fear that if we dare attempt to guide [our evolution] . . . we run a grave risk of being suddenly forced against our wills through some mysterious, outrageously implausible yet inexorable sequence of events culminating in genocide and World War III (Van Court, 1983).

The public has witnessed numerous grim and frightening stories about the Holocaust, along with Nazi propaganda on the creation of "a master race," so quite understandably, it has come to associate eugenics with Nazis and genocide. Who could ever forget the sight of bulldozers shoving mountains of emaciated bodies into mass graves? It's not surprising that the Nazi's strong and vocal support for eugenics has utterly destroyed it as a social movement, because nothing, no matter how inherently benevolent, could survive an association with such nightmarish images. But Germany is just one example of a country with a eugenics program--one very, very conspicuous example.

In the first half of the 20th century, a total of 29 countries passed eugenics laws, including Germany, The United States, Canada, Switzerland, Austria, Venezuela, Estonia, Argentina, Norway, Denmark, Sweden, Brazil, Italy, Greece, and Spain. History tells us that in one country, Germany, there was genocide; in the other 28, there was not (Saetz, 1985). Furthermore, numerous cases of genocide have been committed without so much as a mention of eugenics.

Communism--far and away history's biggest mass murderer--never advocated eugenics, and, in fact, held the opposite beliefs from the Nazis, that the environment causes everything, and heredity counts for nothing. So how can there possibly be a causal connection between eugenics and genocide? In order to prove causation, it's necessary minimally to show a true association. Put simply, one case out of 29 does not an association make.

Consider the following analogy: Imagine that the most salient historical event of all times was the Crusades, instead of the Holocaust, and that for the past 50 years, the Crusades had been the subject of highly sensational movies, documentaries, commemorative ceremonies, newspaper and magazine articles, books, lectures, museum exhibits, and so on. If we didn't know much about Christianity, it would be easy to conclude that it was a war-like religion, and quite reasonably, we'd be concerned that if we should ever convert to Christianity, we might wind up fighting and dying in some Crusade. The emotionally-charged association between "Christianity" and "war" would become indelibly imprinted in our consciousness after being paired thousands of times. It wouldn't be a true association, with predictive value--whenever there's Christianity, there's likely to be war (and vice versa), as would be the case if Christians had actually engaged in a disproportionate share of the wars throughout history--but in fact, it would be a false association, because it's based on just one event which is replayed again and again.

Ghost of Adolf Hitler

To say, "The Nazis believed in eugenics, and they did terrible things" just isn't good enough as a reason to reject eugenics forevermore. Before rejecting the only solution to dysgenics--a serious problem which isn't 'could be' or 'might be' but rather is--it must be firmly established that a eugenics program would actually cause more harm than genetic deterioration of the population.

In order to do that, it would have to be shown that genocide (or some other clearly-specified catastrophe) is, in fact, a very real danger of a eugenics program, and not merely hysteria and irrational anxiety resulting from a false association with Nazi's. The idea that there's an actual risk of genocide as a result of implementing a eugenics program is preposterous, and it has never been established flimsily, let alone firmly!

Draconian practices would be wholly unacceptable and unnecessary in a modern-day eugenics program. Professor Lynn offers no recommendations in *Dysgenics*, leaving that for his promised sequel, to be entitled *Eugenics*. But in light of the problems touched upon in this review, several possible eugenic measures come to mind. Since low-IQ women are much more likely to have unwanted children due to birth control failure, a reasonable first step might be to offer them free long-term and permanent contraception. (Prevention of unwanted births would be a worth-while humanitarian goal in itself, aside from eugenic benefits, because unwanted children are far more likely to be neglected and abused.) A second step might be to provide incentives to criminals (such as reduced sentences) to have vasectomies or tubal ligations. A third step might be to implement various measures to ease the burden of parenthood for college students. Such a program could go a long way toward halting dysgenics, or possibly even reversing it. Professor Lynn concludes *Dysgenics* with a word to his critics:

[W]e have considered the criticisms of the view that the genetic quality of modern populations is deteriorating. These are that there is no genetic determination of intelligence, conscientiousness, crime, educational attainment or socioeconomic status; that there can be an inverse association between intelligence and fertility without genetic deterioration occurring; that there are no genetic differences between the social classes; that there are no such things as bad genes; that the genes for genetic diseases should be preserved, especially in other people, because they make a positive contribution to creative achievement; and that all human types, including the mentally retarded, criminals and psychopaths, are equally valuable. All these arguments have been examined and found wanting. Only one verdict is possible concerning the critics of eugenics who have advanced these arguments, and that is that they have not taken the trouble to examine the research evidence. The eugenicists believed that modern populations were deteriorating genetically. The evidence set out in this book shows they were correct.

Perhaps Professor Lynn is being charitable to his critics by suggesting that they are merely ignorant. A decidedly less charitable view would be that--at least with regard to the high percentage of Marxists and nihilists among them--his critics have read the research, and know perfectly well that it's true, but publicly they insist it's utterly false (in a tone of moral indignation, no less) because it threatens their thinly-veiled political agenda. Like all important works on genetics and IQ of the past few decades, *Dysgenics* is bound to send Marxists/nihilists into apoplexies of agitation and rage. They respond to scientific facts which don't fit their egalitarian ideology by attempting to suppress them, branding scientists who report them "Nazis" and "racists," and publishing devoid-of-substance, pseudo-scientific "rebuttals," which--unlike the scholarly, substantive, straightforward works they line up en masse to rebut--are

welcomed with open arms by the politically-correct media. They can do all of these things, and they can pitch a fit 'till they rupture an artery in their collective, thoroughly repugnant, brain. But they cannot make these facts go away.

We are deteriorating genetically, and the only alternative to leaving future generations an increasingly chaotic, violent, degraded society is called "eugenics." What a dilemma! Have we no other choice than to bequeath to our children a poorer genetic legacy than the one we ourselves inherited? And what if they too live in terror of the ghost of Adolph Hitler? Where will it end? From every imaginable perspective--the economy, education, literacy, crime, welfare, government, the "misery quotient," advancing civilization, and science, to name just a few--human genetic deterioration in intelligence, conscientiousness, and health is a disaster. For the believers among us, add to these the religious implications of dysgenics: How could it be God's will for us to behave irresponsibly and cruelly to people who come after us? Would it not be a sacrilege to thoughtlessly squander God's most precious gifts--in fact, the very ones used to create us in His image?

In retrospect, it seems inevitable that at some point, the widespread knowledge and use of contraception would bring about dysgenics. Many people feel it's wrong for society to attempt to influence reproduction in any way. But it should be borne in mind that dysgenics came about as a result of society's 'meddling' with the natural order of things by introducing contraception, and it's clear some sort of 'compensatory meddling' will be required if we are ever going to set our evolution back on a healthy course.

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The New Enemies of Evolutionary Science

(Note: The following report by J. Philippe Rushton was originally published in Liberty, March, 1998, Vol. II, No. 4, pp. 31-35)

The decencies and pieties of the age are at war with the pursuit of truth.

On January 19, 1989, in the Sausalito Room of the San Francisco Hilton Hotel, my life changed forever. I stood before a lectern speaking to a symposium of scientists belonging to the American Association for the Advancement of Science (AAAS). The title of the brief paper I proceeded to present to the meeting was "Evolutionary Biology and Heritable Traits (With Reference to Oriental-White-Black Differences)."

I reviewed the international literature recently published in academic peer-reviewed journals. I summarized data about traits like brain size, temperament, speed of maturation, family structure, and reproductive variables. I tentatively concluded, roughly speaking, that East Asians, on average, were slower to mature, less fertile, less sexually active, with larger brains and higher IQ scores than Africans, who tended to the opposite in each of these areas. Whites, I found, fell between the other two groups.

I further contended that this orderly tri-level hierarchy of races in average tendency had its roots not only in economic, cultural, familial, and other environmental forces but also, to a far greater extent than mainstream social science would suggest, in ancient, gene-mediated evolutionary ones. Heredity, or nature - to use the term popularized by Francis Galton, Charles Darwin's younger cousin - was every bit as important as environment or nurture, often more so. To account for the racial pattern in brain size and the other "life-history variables," I proposed a gene-based life-history theory familiar to evolutionary biologists as the r-K scale of reproductive strategy. At one end of this scale are r strategies, which emphasize high reproductive rates, and, at the other K-strategies, which emphasize high levels of parental investment. This scale is generally used to compare the life histories of widely disparate species but I used it to describe the immensely smaller variations within the human species. I hypothesized that Mongoloid people are, on average, more K-selected than Caucasoids, who in turn are more K-selected than Negroids.

I also mapped this theory onto human evolution. Molecular genetic evidence shows that modern humans evolved in Africa sometime after 200,000 years ago, with an African/non-African split occurring about 110,000 years ago, and a Mongoloid/Caucasoid split about 41,000 years ago. The farther north the populations migrated, "out of Africa," the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children successfully during prolonged winters. As these populations evolved into present-day Europeans and East Asians, they did so by shifting toward larger brains, slower

rates of maturation, and lower levels of sex hormone with concomitant reductions in sexual potency and aggression and increases in family stability and longevity.

I did not claim to have established the truth of these hypotheses. They may never be established in their entirety. But if they, or any part of them, or even any parallel hypotheses were eventually confirmed, we would have an explanation of why the measured traits are statistically distributed among racial groups in the distinct patterns evident in the data I had examined. The theories provided testable hypotheses and consequently complied with two fundamental goals of any science: the search to provide causal explanations of phenomena, and the search to unify separate fields of thought. These powerful incentives pulled me forward.

I emphasized two caveats in my presentation before the AAAS. First, because there is enormous variability within each population and because the population distributions overlap, it is always problematic to generalize from a group average to any particular individual. Secondly, because genetic efforts are necessarily mediated by neurohormonal and psychosocial mechanisms, many opportunities exist for intervention and the alleviation of suffering. My hypothesis so stunned AAAS organizers that they quickly called a press conference to publicly dissociate themselves from my remarks. At the press conference, the president of the AAAS, Dr. Walter Massey, vice-president for research at the University of Chicago, told reporters that my credentials as a psychologist were good and that scholars participating in the conference were free to draw any conclusions they choose. Massey affirmed that the AAAS would never consider muzzling any scholar because the free expression of views was the essence of academic discussion. He went on to say that I had made "quite a leap of faith from the data to the conclusions" and that he found the paper "personally disturbing" and its conclusions "highly suspect." The scene was eerily reminiscent of the closing sequence of the film *Rosemary's Baby* with the media setting up to take pictures of the newborn devil, cloven hoofs and slit eyes, ready to raise hell on earth. I was about to become an academic pariah. By the time I returned from the conference to my home in London, Ontario, and my job as professor of psychology at the University of Western Ontario, the uproar was in full swing. "Canadian Professor Provokes Uproar With Racial Theories," proclaimed Canada's national newspaper, the venerable *Globe and Mail*. "Theory Racist: Prof Has Scholars Boiling," declared the influential *Toronto Star*. "UWO Professor Denies Study Was Racist," trumpeted the local *London Free Press*. Newspapers took my views to hostile social activist groups and got their predictably hostile opinion. They said I should be fired for promoting hatred. The press then took this idea to the president of the university who upheld the principle of academic freedom. The ongoing conflict was serialized for weeks. Student activist groups soon entered the fray, demanding that I meet with them in a public forum.

TV coverage of my theories juxtaposed photos of me with footage of Nazi storm troops. Editing and voiceovers removed any mention of my qualification that the race differences I had identified were often quite small and could not be generalized to individuals and didn't mention that like any decent human being I abhor Nazi racial policies. Newspapers caricatured me as

wearing a Ku Klux Klan hood or talking on the telephone to a delighted Adolf Hitler. The Toronto Star began a campaign to get me fired from my position, chastising my university and stating "This protection of a charlatan on grounds of academic freedom is preposterous." Later, the same paper linked me to the Holocaust saying, "[Thus] there emerged the perverted 'master race' psychology of the 20th century, and the horror of the Holocaust. Oddly, the discredited theories of eugenic racism still are heard, most recently from an academic at an Ontario university." I had no choice but to hire a prestigious law firm and issue notices under the Libel and Slander Act against the newspaper. This brought the media campaign against me to a halt.

Hate Crime Laws

In the U.S. there is a First Amendment to protect the right of every citizen to free speech and there is not much the government can do to silence unpopular ideas. In Canada and many Western European countries, however, there are laws against free speech, ostensibly enacted to inhibit "hate" and the spreading of "false news."

Two weeks after my AAAS presentation, the premier of Ontario denounced my theories. My work was "highly questionable and destructive" and "morally offensive to the way Ontario thinks," he said. It "destroys the kind of work we are trying to do, to bring together a society based on equality of opportunity." The premier told reporters he had telephoned the university president and found him in a dilemma about how to handle the case. The premier said that he understood and supported the concept of academic freedom, but in this particular case dismissal should occur "to send a signal" to society that such views are "highly offensive."

When the university failed to fire me, the premier asked the Ontario Provincial Police to investigate whether I had violated the federal Criminal Code of Canada, Chapter 46, Section 319, Paragraph 2, which specifies: "Everyone who, by communicating statements, other than private conversation, willfully promotes hatred against any identifiable group is guilty of an indictable offense and is liable to imprisonment for a term not exceeding two years."

The police questioned my colleagues and members of the administration and professors at other universities, demanded tapes of media interviews, and sent a questionnaire to my attorney to which I was obliged to reply in detail. (There's no Fifth Amendment in Canada either). After harassing me and dragging my name through the dirt for six months, the Attorney General of Ontario declined to prosecute me and dismissed my research as "loony, but not criminal."

This did not halt the legal action. Eighteen students, including seven Black students, lodged a formal complaint against me to the Ontario Human Rights Commission claiming that I had violated Sections, 1, 8, and 10 of the 1981 Ontario Human Rights Code guaranteeing equality of treatment to all citizens of the province. In particular, I was charged with "infecting the learning environment with academic racism." As remedy, the complainants requested that my employment at the university be terminated and that an order be made requiring the university

to "examine its curriculum so as to eliminate academic racism." I was outraged. A more flagrant attack on the right to freedom of expression was difficult to imagine in a supposedly free country. "Human rights" tribunals were becoming a menace - a direct threat to the very human rights and fundamental freedoms they were supposed to protect. The Ontario Human Rights Commission could no more change the truth about human races than could the Christian Inquisition about the solar system or the KGB about the genetics of wheat. I found it difficult to accept the increasingly obvious fact that in the post-Soviet world, an academic was freer to say what he believed about some things in Russia, than in Canada.

Four long years after the complaint was lodged, the Ontario Human Rights Commission abandoned its case against me claiming it could no longer find the complainants to testify.

Events at the University

In its relations with the outside world the university administration stood firmly for academic freedom. The president gave a press conference to state categorically that there would be no investigation of me, that I would not be suspended, and that I was free to pursue any line of research I chose.

Behind the scenes, however, I became the target of a witch hunt by some of the administrators. Dismayingly, my dean, a physical anthropologist, publicly declared that I had lost my scientific credibility and spearheaded an attack on me in the newspapers. She issued a series of preemptive statements making plain her negative opinion of me and my work. "What evidence is there for this ranked ordering of the evolution of the human races?" she wrote. "None." Claiming that her views represented only her academic opinion she emphasized that she was not speaking in any administrative capacity. Her letter was nonetheless widely interpreted in the media as a refutation by my "boss." Henceforth, in order to support me, a person would now have to go up against the dean in addition to prevailing opinion. Next, the chair of my department gave me an annual performance rating of "unsatisfactory" citing my "insensitivity." This was a remarkable turnaround because it occurred for the same year in which I had been made a Fellow of the prestigious John Simon Guggenheim Foundation. My previous twelve years of annual ratings had been "good" or "excellent." Indeed, my earlier non-controversial work had made me one of the most cited scholars in my university.

Because unsatisfactory ratings can lead to dismissal, even for a tenured professor like me, I contested the rating through various levels of grievance, wasting an enormous amount of time and emotional energy. The proceedings that followed were Kafkaesque, terrifying when they weren't simply funny. For example, the grievance procedures required that I first appeal the Chairman's negative assessment to the Dean. The Dean had already spoken out against me, so I asked the Dean to recuse herself from hearing the case. She refused. So I had to appear before her.

At my hearing, the Dean's folded arms and glowers of fury made her decision obvious, and six weeks later, she upheld the Department Chair's decision. In a seven-page letter justifying her decision, she cast aspersions at my "sensitivity," and my sense of "responsibility," and questioned whether there were, in fact, "any" papers that had ever been published that had supported my perspective other than those I had written myself.

I decided on a more drastic defense. I wrote to colleagues around the world and received over 50 strong letters of support, many endorsing the evidence I had presented. When the Dean found out about this she went absolutely ballistic, on one occasion screaming and spitting at me in fury.

I eventually won my appeal against the Dean and the Chair and two separate grievance committees chastised them for their actions against me. My annual performance ratings are back to receiving grades of "good" and "excellent." Some radical and Black students mobilized and held rallies, even bringing in a member of the African National Congress to denounce me. In one demonstration, a mob of 40 people stormed through the psychology department, banging on walls and doors, bellowing slogans through bull horns, drawing swastikas on the walls, and writing on my door "Racist Pig Live Here."

The administration responded by barring me from the classroom and ordering me to lecture by videotape on the pretext that they could not protect me from the lawlessness of students. Again I launched formal grievances. After a term of enforced teaching by videotape, I won the right to resume teaching in person, though then I was required to run a gauntlet of demonstrators shouting protests and threats. Only after several forced cancellations of my classes did the administration warn the demonstrators that further action would lead to suspension and legal action. That brought the protests to a halt.

De Facto Censorship and the Corruption of Scholarship

As a graduate student at the London School of Economics and Political Science in 1973, I witnessed a physical assault on Hans Eysenck, who was studying the biological basis of intelligence and had recently published his book *Race, Intelligence, and Education* (1971). The slogan of that day was "Fascists Have No Right To Speak," and Eysenck became a target for attack. No legal charges were brought for the widely witnessed assault because another popular slogan of the 1960's, for those who approved the message but disapproved the tactic, was "There are no Enemies on the Left." Stories of harassment and intimidation could be told by many others who have had the temerity to research topics that touch on the genetic or distributional basis of race differences.

Today, many campus radicals from the 1960's are the tenured radicals of the 1990's. They have become the chairs of departments, the deans, and the chancellors of the universities: senior political administrators in Congress and Houses of Parliament, and even the presidents and

prime ministers of countries. The 1960's mentality of peace, love, and above all, equality, now constitutes the intellectual dogma of the Western academic world. There are laws to prohibit platforms for those denounced as "fascists" and others deemed to be not politically correct.

In his book, *Kindly Inquisitors*, Jonathan Rauch showed that even in the U.S. with the First Amendment in place, many colleges and universities have set up "anti-harassment" rules prohibiting - and establishing punishments for - "speech or other expression" that is intended to "insult or stigmatize an individual or a small number of individuals in the basis of their sex, race, color, handicap, religion, sexual orientation or national and ethnic origin." (This is quoted from Stanford's policy, and is more or less typical.) One case at the University of Michigan became well known because it led a federal court to strike down the rule in question. A student claimed, in a classroom discussion, that he thought homosexuality was a disease treatable with therapy. He was formally disciplined by the university for violating the school's policy and victimizing people on the basis of sexual orientation.

In Canada and Western Europe, governments can and do prohibit speech on topics they consider obnoxious. In Denmark, a woman wrote a letter to a newspaper calling national domestic partner laws "ungodly" and homosexuality "the ugliest kind of adultery." She and the editor who published her letter were targeted for prosecution. In Great Britain, the Race Relations Act forbids speech that expresses racial hatred, "not only when it is likely to lead to violence, but generally, on the grounds that members of the minority races should be protected from racial insults." In some parts of the world you can be jailed, exiled, or even executed for expressing forbidden opinions.

Irrespective of religious background, or political affiliation, virtually all American intellectuals adhere to what has been called 'one-party science.' For example, only politically correct hypotheses centering on cultural disadvantage are postulated to explain the differential representation of minorities in science. Analyses of aptitude test scores and behavioral genetics are taboo. Cheap moralizing is so fierce that most people respect the taboo. This intellectual cowardice only encourages vicious attacks by activist groups on those who are engaged in legitimate scientific research showing that there is a genetic basis underlying individual and group differences.

The high-placed pervasiveness of the egalitarian orthodoxy is scary. Even more frightening than what happened to me is the experience of Christopher Brand, professor of psychology at Edinburgh University. On February 29, 1996, Brand's book on intelligence, *The g Factor*, was published in the United Kingdom by the British subsidiary of John Wiley & Sons, Ltd. On April 14, newspaper reports of interviews with him began to appear saying that he thought black people had a lower IQ than did whites and that these were probably partly genetic. On April 17, Wiley's company in New York denounced Brand's views as "repellent" and withdrew the book from bookstores. A blizzard of "refutations" of Brand appeared in the U.K. media under outraged headlines. Protests from members of Parliament, student boycotts of his lectures, and

calls for his resignation by faculty at the University of Edinburgh all predictably ensued. Brand's refusal to be silenced and his defense of free speech led him to be fired (on August 8, 1997) for bringing his university into disrepute. There but for the grace God, go I. In 1995, my monograph *Race, Evolution, and Behavior* was published by Transaction Publishers. Subsequently, the book was translated into Japanese (1996) and released as a softcover edition (1997) with an Afterword updating the science since the hardback went to press.

The book garnered a lead review in the *New York Times Book Review* (October 16, 1994) where Malcolm Browne, the *Times* science writer, discussed it along with Richard Herrnstein and Charles Murray's *The Bell Curve* and Seymour Itzkoff's *The Decline of Intelligence in America*. Browne concluded his analysis with the statement that "the government or society that persists in sweeping this topic under the rug will do so at its peril." Dozens of other journals, including the *National Review*, *Nature*, and *The Nation*, also reviewed it.

Its publication by an important academic press touched off a new round of hysteria. A lurid article screaming "Professors of HATE" (in five-inch letters!) appeared in *Rolling Stone* magazine (October 20, 1994). Taking up the entire next page was a photograph of my face, hideously darkened, twisted into a ghoulish image, and superimposed on a Gothic university tower. In another long propaganda piece entitled "The Mentality Bunker" which appeared in *Gentleman's Quarterly* (November 1994), I was misrepresented as an outmoded eugenicist and pseudoscientific racist. A photograph of me was published in brown tint reminiscent of vintage photos from the Hitler era.

Incredibly, Canada Customs seized and withheld copies of one shipment of the book for nine months while they tried to decide whether to condemn the book as "hate literature" and ban it from entering Canada. The fact that an academic book was even the subject of an investigation stunned my publisher: "I've never heard of such a thing," said Mary Curtis, Chairman of the Board of Transaction. "This is not supposed to happen in Canada. The last time the company had trouble shipping scholarly works was in the mid-1980's, when some books shipped to the Moscow Fair didn't make it."

Michel Cl  roux, a spokesman for Canada Customs, said Customs were just following orders by investigating possible hate propaganda. A departmental policy prohibiting hate propaganda includes this definition: "Goods alleging that an identifiable group is racially inferior and/or weakens other segments of society to the detriment of society as a whole." After an "investigation" lasting nine months, Canada Customs relented.

Harassment continued at another meeting of the American Association for the Advancement of Science. The AAAS routinely allows the militantly disruptive International Committee Against Racism (INCAR) and Progressive Labor Party (PLP) to have official "Exhibitor" status, along with a booth, at its annual meeting. At the February 1996 meeting in Baltimore, INCAR and PLP festooned their booth with posters of Karl Marx and signs taking credit for interfering with

the University of Maryland conference on "Genes and Crime" in September 1995. At the AAAS meeting, INCAR targeted my poster presenting a review of the literature on brain size and cognitive ability. When INCAR encountered me the day before the poster presentation, they yelled so many death threats that the AAAS called the Baltimore police, who dispatched an armed officer to stand by the presentation. Despite the guard, INCAR continued to utter threats. One demonstrator took photographs of me saying they were for a "Wanted: Dead or Alive" poster. "You won't be living much longer," he said. Incredibly, instead of cancelling the Exhibitor Status of organizations that threaten violence, the program director of the AAAS's annual meeting said, in an interview published in *The Scientist* (March 4, 1996), that AAAS would tighten up the screening process to make it more difficult for presentations like mine to get on the program! As Charles Murray has observed in the aftermath to *The Bell Curve*, social science is corrupt on the topic of race. Yet, the genetic hypothesis for the pervasiveness of the three-way racial pattern across so many traits, and which calls into question simple explanations based only on social factors like discrimination and poverty, needs to be discussed.

In his commencement address to the graduating class of 1997 at the University of California (San Diego), U.S. President Bill Clinton called for a new dialogue on race and for "deepening our understanding of human nature and human differences." But apparently there are some aspects of human nature and human differences he'd rather leave unexplored.

I've learned a great deal since that day in 1989 when I stood before that meeting of scientists and presented a summary of my research, thereby making myself the target of harassment by the politically correct and the object of intimidation by the government of Canada. Despite the vicious campaign against investigation of the possible genetic basis of group differences, my interest never wavered. Work on other topics seemed shallow by comparison. Spurred by attacks and aided by colleagues, I have sought out more definitive tests of the genetic hypothesis and continue to publish my research.

I've also learned how important freedom of inquiry is to science, which must always remain to pursue truth without regard for where that pursuit leads. I've learned to treasure such remnants of freedom of speech as I enjoy as a citizen of Canada, and remain more committed than ever to the search for truth. As Benjamin Franklin observed more than two centuries ago, "Without freedom of thought, there can be no such thing as wisdom, and no such thing as public liberty, without freedom of speech."

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Whatever Happened to Eugenics ?

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Review of:

Heredity and Humanity: Race, Eugenics and Modern Science Roger Pearson Scott-Townsend Publishers, Washington D.C., 1996 ISBN 1-878465-15-5 162 pps.

"Most of those who have sought to suppress human knowledge about heredity have done so with kindly intentions, but sound policies can never be constructed on bad science or unsound data. Any society that sets itself against the immutable causal laws of biology and evolution will ultimately bring about its own demise" (Pearson, p. 140).

Whatever happened to Eugenics? How is it that the prevention of human suffering came to be considered as the greater evil? In this delightful little book Roger Pearson takes us on an excursion through history, science and ideologies.

In so doing he illuminates the origins of great concepts and names the heroes and the villains in a saga that is not yet complete. In recommending this book to a Seminar in Evolutionary Psychology I told the graduate students that it is "an anti-PC, anti-egalitarian, historical polemic, well referenced and worth reading - this is not the story you got in cultural anthropology class." This is a story well-told that needs wide telling, and serious pondering by all who are concerned for the welfare of our civilization.

The opening chapter (The Concept of Heredity in the Ancient World) serves to remind the reader that heredity has been considered important since before the beginning of recorded history, and at least until earlier in the twentieth century. Unfortunately, these observations will be new to many students who have suffered a modern deconstructed education. Pearson announces his agenda in that the opening chapter "illustrates the deep belief in the importance of heredity and race which prevailed from the earliest times until roughly the end of the nineteenth century. Subsequent chapters document the rise of politically-motivated egalitarian ideology which, heavily supported by the media, eventually succeeded in making the idea of

biological inequality taboo. Despite the fact that there is today a rapidly developing body of scientific research which validates the age-old comprehension of the role of heredity in shaping human abilities, too many people are unaware of the mechanics behind the swing toward the notion of the biological equality of mankind" (p. 9).

The mechanics of the swing will be well understood by the readers of this book. Pearson reasonably speculates that an appreciation of heredity probably existed at least as early as the Neolithic origins of agriculture and animal husbandry. It is well documented with ample quotes (Plato, the Odyssey, Theognis, etc.) that the ancient Greeks had a keen appreciation of hereditary contributions to both physical and mental traits. Unlike the matrilineal and patrilineal clan systems of many other peoples, the ancient Germanic "kindred" acknowledged the actual degrees of genetic relatedness on both paternal and maternal sides. This Germanic kindred is the basic traditional approach to family shared today by most North Americans of European descent.

Multicultural egalitarianism reared its civilization - destroying head in the ancient world. Early on, freeborn Romans could only marry among certain stocks under the system of connubium. But with military and bureaucratic successes the empire grew to become a "multicultural giant", "ripe for the rise of egalitarian political ideologies" (p.13):

The coming of Christianity plunged logic and classical philosophy into centuries of near-oblivion and clashed with the established and ancient European belief in the inequality of men. Spreading first among the slaves and lowest classes of the Roman empire, Christianity came to teach that all men were equal in the eyes of a universal Creator God, an idea that was totally alien to older European thought which had recognized a hierarchy of competence among men - and even among the gods. Opposing the traditions of classical philosophy and scientific enquiry, Christianity introduced into Europe the concept of a single omnipotent 'God of History' who controlled all the phenomena of the universe - with men and women being creations of that God. Since all men and women were the 'children of God', all were equal before their Divine Maker! Faith in the church's interpretation of supposedly prophetic revelations became more important than scientific or philosophical enquiry; and to question the church's view of reality came to be perceived as sinful. Christianity carried the anti-intellectualism of the Middle Eastern prophets to its extreme (p. 14).

And the weakened, multicultural egalitarian Roman Empire soon fell "before the onslaught of the smaller, more homogeneous, Germanic nations, which still retained a sense of group identity" (p.13).

Across the centuries of church domination the notions of hereditary differences among men were discouraged in the service of Church power. The "divine right" to rule, given by God, became quite different from the earlier concept of hereditarily noble ruling lineages. Stripped by the Church of belief in the importance of human heredity and of the notion of the state as a

kinship unit - "a family writ large" (p.16), believing instead in the essential equality of all God's children, the stage was set for the development of egalitarian-espousing secular political movements:

Such was the case of the Levellers who fought alongside the Parliamentarians in seventeenth century Britain; of the Jacobins, who decimated the accomplished aristocracy of eighteenth century France; and of the Bolsheviks who wrought genocidal slaughter among the more successful members of Czarist Russian society In recent times, calls for political revolution have frequently invoked attacks on 'genetic determinism' in favor of the alternate, wildly illogical, philosophy of 'biological egalitarianism'.... The suggestion that one individual might be inherently more creative or productive than another was unlikely to fuel the feelings of resentment necessary to incite the masses to revolutionary action (p. 17).

After more than a thousand years of intellectual suppression, there eventually was a renaissance. By the eighteenth century thinking people were well aware of inherited differences among individuals and races. Thomas Jefferson certainly did not confuse rule of law [.... all men are created equal] and hereditary reality. In a letter to John Adams, Jefferson states that "I agree with you that there is a natural aristocracy among men. The grounds of this are virtue and talents. For experience proves, that the moral and physical qualities of man, whether good or evil, are transmissible in a certain degree from father to son" (Jefferson, at Monticello, October 28, 1813). Jefferson's view concerning the profound inherited differences between the black and white races are well known, and are documented in his "Notes on the State of Virginia" and elsewhere throughout his writings.

In the chapter "The Discovery of Evolution: Eugenics and the Pioneers of Modern Science" Roger Pearson presents the scientific heroes of early eugenics. The topmost trinity are Charles Darwin, Sir Francis Galton, and Karl Pearson. By all accounts a kind and gentle man, Charles Darwin delayed over twenty years between formulating his theory of evolution by natural selection and its publication (Desmond & Moore, 1991). His feeling for his wife's religious sensitivities, and a reluctance to be excoriated by correct society, contributed to the delay.

Were it not for Alfred Russel Wallace, Darwin may well have traveled the road of such luminaries as Copernicus and Descartes and not published until beyond the reach of disapprobation. However, Darwin received instant acclaim among important scientists when appeared in 1859 his masterpiece *The Origin of Species by Means of Natural Selection or The Preservation of Favoured Races in the Struggle for Life*.

Among those profoundly influenced was Darwin's half-cousin (same grandfather - Erasmus Darwin - different grandmother) Francis Galton. Already an eminent scientist, explorer, and inventor in his own right, Galton later wrote to Darwin:

I always think of you in the same way as converts from barbarism think of the teacher who first

relieved them from the intolerable burden of their superstition.the appearance of your Origin of Species formed a real crisis in my life; your book drove away the constraint of my old superstition as if it had been a nightmare and was the first to give me freedom of thought". (from Karl Pearson, 1924).

It was Galton who immediately took up the scientific study of human diversity, human ability, and the evolution of civilizational capacity. By 1865 Galton published two important articles which shared the title "Hereditary Talent and Character", in 1869 he published Hereditary Genius: An Inquiry into Its Laws and Consequences. From the beginning Galton's work on heredity combined science (which later developed as human genetics) with notions of applications for the benefit of humanity. Galton founded, and then in 1883 named, the new science, eugenics. The term was from the Greek eugenes ("well born"), and Roger Pearson tells us:

In Galton's own words, the purpose of genetic science was "to give the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable."(p. 19).

The humanitarian goal of eugenics was summarized by Galton in 1908:

Man is gifted with pity and other kindly feelings; he has also the power of preventing many kinds of suffering. I conceive it to fall well within his province to replace Natural Selection by other processes that are more merciful and not less effective. Natural Selection rests upon excessive production and wholesale destruction; Eugenics on bringing no more individuals into the world than can be properly cared for, and those only of the best stock. (Galton, 1908, p.323).

Heartened by Galton's applications of evolution to humanity, and by his investigations into the laws of heredity, Darwin was encouraged to prepare his own notes and thoughts concerning human evolution, and, in 1871 published The Descent of Man. In light of what came after it is important to emphasize that neither Galton nor Darwin, nor I dare say any competent scientist, doubted that the races differed profoundly in hereditary characteristics. As illustration Roger Pearson provides the following excerpt from chapter seven of The Descent of Man:

" the various races, when carefully compared and measured, differ much from each other - as in the texture of hair, the relative proportions of all parts of the body, the capacity of the lungs, the form and capacity of the skull, and even the convolutions of the brain. But it would be an endless task to specify the numerous points of difference. The races differ also in constitution, in acclimatization and in liability to certain diseases. Their mental characteristics are likewise very distinct; chiefly as it would appear in their emotion, but partly in their intellectual faculties. Everyone who has had the opportunity of comparison, must have been struck by the contrast between taciturn, even morose aborigines of S. America and the light-hearted talkative negroes (p. 20).

In order to study heredity Galton revolutionized methods, becoming "The Father" of modern statistics. The younger applied mathematician and social activist Karl Pearson [later to be Galton's major biographer] became an important colleague. Karl Pearson generalized the mathematical foundations of Galtonian statistical concepts, and further developed statistics in his quest of eugenical science. He was one of the most influential scientists at the turn-of-the-century, and emphasized eugenics in books with titles such as *National Life from the Standpoint of Science* (1901), and *Nature and Nurture: The Problem of the Future* (1910). Karl Pearson had deep concerns for the welfare of the British Empire, he feared that current conditions were having dysgenic consequences such that the quantity of qualified persons would be insufficient to maintain the Empire. Judging from the changes to the British Empire over the century from 1896 to 1996, there is certainly nothing apparent that contradicts his concerns. At one point he lamented "We have placed our money on environment, when heredity wins in a canter".

Roger Pearson makes abundantly clear with extensive documentation and fascinating text that the period up until approximately 1930 saw the flowering of eugenics in science, society and law. Many humanitarians of both the left and the right were united in an enthusiasm to improve human stock and prevent human suffering, rather than to only treat suffering after the fact. Eugenic ideals were embraced by such luminaries as George Bernard Shaw, H. G. Wells, Havelock Ellis, A. J. Balfour and Winston Churchill, to list but a few in Britain. In the United States such influential people as Henry Ford, Madison Grant, Margaret Sanger and Theodore Roosevelt were enthusiastic. The Carnegie Institute of Washington established, with Harriman family funds, the Cold Spring Harbor Eugenics Record Office under the leadership of the geneticist Charles Davenport.

Organizations such as The Galton Society and The Race Betterment Foundation were founded with ample scientific and social support. Writing for a majority (only one justice dissented) of the United States Supreme Court in 1927, Justice Oliver Wendell Holmes, Jr., noted:

It is better for all the world if instead of waiting to execute degenerate offspring for crime, or let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. Three generations of imbeciles is enough (*Buck v. Bell*, 1927).

With such widespread support eugenics might have continued to develop as a major component of progressive society. Alas, such was not to be. Within the movement, R. Pearson points out, there developed schisms between those interested in race betterment and those more interested in prevention of specific genetic diseases - a breach between positive and negative eugenics. At the same time the "eugenic ideal - the desire to engineer a healthy genetic heritage for future generations - came under increasing attack from those who were ideologically committed to egalitarianism. The latter refused to see the eugenic ideal in any light other than as an hierarchical concept implying superiority and inferiority - the precise pattern of thought they

sought to eliminate from social consciousness. They, too, sought to engage in social engineering, though engineering of a political nature which would have unanticipated dysgenic consequences, and the stage was set for the intense emotional struggle which today dominates both academia and the media, about the political correctness of permitting research into behavioral genetics, as well as the right to propagate information about the role of heredity in shaping the limits of human abilities and behavior." (pp. 52 - 53).

The arch villain on the academic front, instrumental in supplanting and then demonizing eugenics was Franz Boas, aided by a large entourage of students and fellow-travelers. One of the main take-home messages is that honest empirical science does not fare well, at least in the short run, when up against ideologically inspired polemics in which almost anything goes in the service of a greater good [the end justifies the means]. In Chapter V (Radical Egalitarianism Penetrates Academe), and the following few chapters, Roger Pearson exposes the players and the agenda promoting the egalitarian fallacy. It is a fascinating expose of names, dates, and events, too rich to be dealt with adequately in even a lengthy review. The reader is reminded of the Verona files, recently released documentation of the extensive infiltration of American government and society by communist agents. In very important respects Joe McCarthy was neither paranoid nor mistaken. Roger Pearson here makes clear that the academic and anthropological/psychobiological scientific fronts were not immune from the same intellectual infestations.

Born of a pair of politically radical socialists who were active in the 1870-71 wave of revolutionary movements across Europe, Franz Boas emigrated to the United States in 1886. In coming to America he was following Abraham Jacobi, an uncle by marriage, who came after being released from prison for armed violence in the Cologne revolution of 1848. Jacobi was active in the revolutionary socialist movement in the United States, and was in a good position to provide influential contacts for his kinsman. Boas "became the head of a department of anthropology established at Columbia University, where he trained and awarded doctoral degrees to numerous selected students. Equipped with the earliest American doctorates specifically designated as being in the field of anthropology, his students by default became the leaders and prime builders of academic anthropology in the United States, rapidly establishing themselves as the arbiters of anthropological research, publishing and teaching in American universities.

Interestingly, as late as 1911, in his book *The Mind of Primitive Man*, Boas had admitted that: "[d]ifferences of structure must be accompanied by differences of function, physiological as well as psychological; and, as we found clear evidence of differences of structure between races, so we must anticipate that differences in mental characteristics will be found."

However, Boas was shortly to reverse this position when he realized that the recognition of genetic forces conflicted with the goals of his egalitarian and internationalist ideology, which sought to demolish the unity and coherence of national units. Instead he began a massive

campaign to undermine national and ethnic consciousness and 'combat racism' in whatever form it might find expression. In particular, his [books] were devoted to downplaying the concept of heredity and undermining the eugenic ideal. The spread of Boasian doctrines was further facilitated by the position of world dominance then enjoyed by the Western nations. Spurred by an ethical desire to shoulder 'the white man's burden' in a shrinking world, many academics came to believe that Mankind should now abandon the Darwinian struggle and treat the diverse subspecies of mankind as members of a single, international gene pool. This was an ethical concept not shared by the non-Western nations, who adhered to more functional, self-promoting, competitive patterns of behavior. the desire that biological egalitarianism should be true gained strength as human altruism was redirected away from the immediate group ..[to].. an ideology which favored overall sapiens homogenization. The new radicals in U.S. social science found it convenient to downplay heritability; and Boas's earlier acknowledgment of human biological disparities was edited out of his 1938 edition Those to whom Boas awarded doctoral degrees in anthropology generally shared his ideologies and became prime disciples of egalitarian universalism" (pp. 57 - 59).

Among his many students were Margaret Mead, the "mother of American anthropology", eventually exposed as a hoaxster and communist propagandist, and Israel Ehrenburg (A.K.A. Ashley Montagu) whose "entire career was built around a bitter crusade against the work of respected scholars such as Carleton Coon, who recognized race as a vital product of human evolution" (p. 62). Others too numerous to even list are exposed in their infamy.

Many world events contributed to the growth of anti-eugenic egalitarianism, not least among which was the suffering associated with the world-wide depression which followed World War I. The growth of Nazism and the outcome of W.W.II provided an unfortunate boost to anti-eugenic sentiment. It was a propaganda coup of tremendous proportions to be able to paint eugenics with the tar brush of Nazi anti-Semitism. Never mind that it makes no more sense than to condemn all of pharmaceutical science or medical surgery because German science and applications were well developed in those fields. The propaganda damage was done, and it became unacceptable to even mention the possibility of race differences in behavior at the same time that Lysenkoism, condemning all genetics, was taking hold in the Soviet Union.

Biological egalitarianism became the only 'politically correct' doctrine among Marxists throughout the world, and permeated Western [universities] through the teachings of faculty members who were ideologically attracted to egalitarianism but were balefully ignorant of even elementary biology." (p. 71).

The Science for the People movement sprang up as part of the counter-culture protests in the era of the Vietnam War; "The political left-wing had now achieved ascendancy in the universities of the Western world. Indeed, many contemporary evolutionary scientists still seem to wish to be perceived as believing in equality, in a degree of malleability of human nature that does not exist. .. [Pee-Cee evolutionists focus] their writings on the 'panhuman' traits shared by all

living hominids" (p. 73). They attempt to deny any genetic diversity among living races. Indeed, some even deny the existence of races. A sickly accurate joke has it that "It takes a Ph.D. in biology from Harvard to not be able to discern any difference between an Eskimo and a Hottentot"!

The second half of the book deals in fascinating depth with essentially current happenings, both in eugenical science [genetics], and in ideological countermoves to empirical science. On the one hand, DNA fingerprinting can now establish, from a drop of saliva or dried blood, the race of origin to a probability of error of less than one-in-a-hundred-million. Incredibly, at the same time popular media and scientific publications stridently proclaim that biological [genetic] races do not exist. We are now in critical times, a race is occurring around us between humanitarian applications of modern genetic science (eugenics, that is) and the suppression of knowledge by PeeCee ideologues. The media, by-and-large trained by egalitarians, know no better than to attack as "racist", "repellent", or "repugnant" almost any admission of information concerning behavior and genetic diversity among human races. Yet at the same time the human genome project in combination with a wide variety of research in the neurosciences [brain science] and behavioral medicine and genetics in general, is quickly taking us beyond the point where race differences can be obfuscated or denied. So? It is ominous that there is a proliferation of 'hate crime' and 'hate speech' laws being considered or already in existence in various European countries, Australia, and Canada. While in the United States, under the umbrella of first amendment freedom-of-speech protection, academic tenure is under wide-spread attack and previously respectable academic publishers are censoring authors and censoring their book lists, even withdrawing from publication a title deemed "repellent" for including mention of race differences.

Whatever happened to eugenics? In China it is alive and well. The "Maternal and Infantile Health Care Law" went into effect on 1 June 1995. A media mention states "The official Xinhua News Agency reported that China currently has more than 10 million disabled people whose births could have been prevented if such a law had been in effect" (Tallahassee Democrat, 1994).

Meanwhile, in the West, eugenics continues to encounter politically motivated attempts to suppress. As the scientific advances continue at an accelerating pace, it remains to be seen if rational humanitarian applications of sound genetic knowledge can be implemented for the benefit of mankind, or if we will slip into another era of anti-intellectual totalitarianism. Anyone concerned for the future of mankind should carefully read this book. It is not the story you were told in cultural anthropology class.

... there is now no reasonable excuse for refusing to face the fact that nothing but eugenics
..... can save our civilization from the fate that has overtaken all previous civilizations" (p. 136).

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Foreword to David Duke's book "My Awakening: A Path to Racial Understanding", by Glayde Whitney

Over two hundred years ago, one of the most influential of the social critics that made the Enlightenment was Francois Marie Arouet. Even though Voltaire deemed it prudent to write anonymously under a pen name, still he was imprisoned for eleven months and spent years in exile. One of his most famous quotations became a central pillar of American freedom. It was in 1770 that Voltaire wrote, "Monsieur l'Abbe, I detest what you write, but I would give my life to make it possible for you to continue to write."

Now over two hundred and twenty five years later, with the great good fortune to be living in the "Land of the Free", under the protection of the First Amendment's guarantee of freedom of speech, and with the further umbrella of academic tenure -- an institution whose only purpose is to make possible the speaking of truth to power -- it is still with great trepidation that I pen this preface.

David Duke has the distinction of being the only American politician to be smeared more viciously than Patrick Buchanan. With the entire establishment against him: press, church and state, he won public office as a state representative. In a bid for Governor, he defeated in the first primary, the sitting republican Governor, and then lined up against a dubious democrat character with a reputation for graft and corruption. Vastly outspent, one of the prime slogans against Duke that appeared on bumper stickers throughout the state was "Vote for the Crook -- It's Important." The crook won. Corruption was preferable to political apostasy. Even so, Duke won a landslide of more than 60 percent of European-American voters in each of two statewide races.

Duke has endured an intense and unrelenting smear campaign for decades. Once you read this book you will know why he has been attacked by those of immense power. He challenges all the sacred cows of modern life, and he does so with intelligence and emotion.

Voltaire and David Duke are warriors in a conflict that is as old as civilization. The Harvard biologist, historian and philosopher of science Ernst Mayr suggested that as human populations evolve from savagery to civilization their approach to knowledge takes one or another of two paths. One approach leads to modern rationality, including the values of post-Enlightenment free societies and the questing after truth that forms the basis of modern science. The other approach leads to totalitarianism based in dogmatic authority. The direction toward freedom, traceable back to the philosophies of ancient Greece, is unique to Western European Civilization.

The direction toward rationality and science traces to the first recorded Western philosopher, Thales of Miletus (c.636 --c. 546 BC). Thales maintained that to gain knowledge and

understanding one should start with naturalistic observation, that is, descriptions of events as they exist in the real world. We should then seek natural explanations for natural phenomenon. A third major position was that it is acceptable, even encouraged, to question existing explanations, to entertain diverse viewpoints, to have the freedom to use criticism in order to improve knowledge and theories. These three principles, which trace to the beginnings of recorded Western thought, capture the essence of modern freedom and science. Alas, from Thales' time down to the David Duke of today, this approach has been a minority position under constant attack.

The road to dogma starts with assertions of knowledge based in authority. Marxian economics, Boasian egalitarianism, and Freudian psychoanalytic theory equally well illustrate dogmatic belief systems. Not only are criticism and questioning not encouraged, they are condemned. The questioner is shunned, outcast, outlawed and labeled a heretic, hater and evil sinner. David Duke is a questioner.

It is clear from David Duke's autobiography that he was an intelligent, indeed a precocious child, and much of a free-thinker from the beginning. An impartial clinical psychologist might detect elements of an oppositional personality in his self-description. An essential feature of such a child is a provocative opposition to authority figures. When told how things are, such a child asks "why" a bit more than is usual. If bright enough, the child might take great delight in checking the facts for himself. Rare is the student that digs in the library for the original sources. DSM-3, a now somewhat dated psychiatric diagnostic manual says, "The most striking feature is the persistence of the oppositional attitude even when it is destructive to the interests and well-being of the child or adolescent." Seekers of truth, shifters of paradigms, innovators in civilization, have shared such traits, and have often failed to outgrow them, whether they be Socrates, Thomas Aquinas, Martin Luther, Galileo Galilei, Isaac Newton, William Shockley or David Duke.

It is easy to imagine how a brilliant child from a traditional Christian background, but with oppositional tendencies, might be profoundly affected by growing up in a southern city through the turmoil of the civil rights movement. Starting from an unquestioning acceptance of Christian and American ideals [and still a believer in both, I should add] as learned from home, church, school, and media: equality for all, loving brotherhood of all men, turn-the-other-cheek, the sermon-on-the-mount, and do unto others. Imagine the life-wrenching shock for such a precocious child who relates intellectually, as well as with deep emotion, to the inscription on the Jefferson Monument, "Nothing is more certainly written in the book of fate than that these people [Negroes] are to be free.", but then uncovers for himself the full context of the quote, the next sentence from which was taken the inscription: "Nor is it less certain that the two races, equally free, cannot live in the same government." But David Duke tells this tale of his awakening much better than I can paraphrase.

David Duke's awakening is presented here in three interconnected major themes of his

discoveries of honest truths that are politically incorrect. One of his honest truths is that from a thorough immersion in modern science he became convinced that racial egalitarianism is the scientific equivalent of the flat-Earth theory. He rejects the smear of "racist" while maintaining that the true data are very different from those that most of us have been led to believe. A second of his sets of honest truths is that a powerful and cohesive self-serving group has promoted a dishonest and hypocritical version of egalitarianism that is inimical to the interests of Western Christian Civilization. He rejects the smear of "anti-Semite" while maintaining that the true data are very different from those that most of us have encountered through the mass media.

In a style to be expected from a sincere oppositional who is truth-telling as best he can, David Duke's ultimate challenge to his reader not to take his word for it, but to check it out for yourself. Toward that end he provides on the order of a thousand references and footnotes. The gauntlet is clearly thrown down. Here is the evidence, here are the sources: Check it out for yourself.

It is a powerful approach. It is the approach of Western Civilization traceable right back to Thales. No amount of dogmatic name-calling, no smear, no hate-speech laws, no internet filters, no criminalization of history, not even total quarantine and book-banning, can stand against a simple guide to where the truth is to be found. If read by his fellow citizens David Duke's story of his own awakening might awaken them as well, and in so doing rattle civilization to its very core.

How is it that I came to write this preface to a book written by a man that I have never met in person? David Duke tells us how he dreamed to become a scientist and instead, growing in the turbulent urban south, he was diverted into a life of politics. I, on the other hand, had the fortune, good or bad, to be born in Montana and raised in Minnesota. I was fully adult before I had many real encounters with racial or ethnic diversity and have never been into politics. Fascinated since childhood by animal diversity, and also an avid birdwatcher, I trained toward a scientific career at the interface of evolution, genetics, and psychology. Raised in Minnesota I became a Hubert Humphrey liberal - and remain one to this day. Equality of opportunity for each individual, equal treatment before the law, in an orderly society with rule-of-law, these are ideals I treasure.

The social disruptions of the middle and late 1960s that formed David Duke were never a real part of my personal experience. At Alamogordo New Mexico, just down the road from the Trinity Site and on the edge of the White Sands Missile Range, we were helping to reach for the Moon. Research preparatory for the Apollo Missions was a heady assignment for a young scientist. By the time I returned to civilian life and to a position as a faculty member at a state university, the worst of the troubled times were over.

One of my favorite senior colleagues, a mentor at my new university, cautioned that although I

was into behavior genetics, it would be prudent to avoid that "human business." He said that being at a southern university I would have no credibility, and that none of us needed the flak. He had once published a scholarly paper dealing with the tested intelligence of black and white school children - and had been savaged by vicious ad hominem attacks and personal threats. Those were hassles that I did not need, especially since there were so many other intellectually challenging research opportunities. It was easy to climb into the ivory tower of basic research.

Over the years I did my research and followed that of others, raised a family and had little or no interest in politics. Still, there were discussions of some pretty silly things. Like blatant racial discrimination under the label of "affirmative action" Embarrassingly unprepared and incapable people being cajoled into situations for which they were unsuitable while competent potentials were being turned away. As time went on, the public rhetoric became ever more distant from the scientific realities. The technical questions had always been why -- what were the reasons for the large intellectual gap between blacks and whites? As the hard scientific data came in, it became more certain that genetic differences (heredity) played a large role in the discrepancy. But in public it became politically incorrect to even acknowledge that there was a difference.

It was disturbing that some of my respected scientific colleagues seemed to be less than candid. The private discussions at scientific meetings became weirdly disjointed from public pronouncements. Simply, scientists lied by omission and by commission Some had a frankly elitist attitude, that "the masses" could not be trusted with the truth. The famous Richard Lewontin is quoted as having written "Sometimes even scientists tell conscious lies to make a point." He should know. Honesty had always been to me the first and the highest of scientific requirements. But some of my colleagues in science had a different agenda.

Completely separately from David Duke, my inquiries led to essentially the same places and some of the same conclusions, that he spells out in this book. My own "awakening" involved a second major wake-up call on that most forbidden of subjects. It resulted from a close friendship with an extended family, Americans of Christian Lebanese ancestry. Through long talks with "Uncle Mike", a kindly physician who was the family patriarch, I learned of the naked aggression of Israel against the Palestinian people. Slowly, my eyes were opened to an international racism that was at least as pernicious as that alleged against David Duke. At the same time, I discovered that Duke's "racism" was not born of hatred, but of science and of history.

At the present time in Western science, I believe that an important distinction must be acknowledged between individuals and Judaism as a group endeavor. As individuals, scientists of Jewish ancestry cover the entire spectrum of interpretations and approaches to race and heredity. To mention just two individuals, the late Richard Herrnstein was a co-author of *The Bell Curve*, (1994), while Michael Levin, author of *Why Race Matters*, (1997), has withstood much wrath for his truth telling. From personal experience in academia, it is sometimes hard to believe that Jews constitute only 2% or 3% of the general population Individuals of Jewish

ancestry are vastly overrepresented in the ranks of highly successful scientists. They are among my best students and closest friends.

Organized Jewry, on the other hand, dogmatically attempts to keep the general population from awareness of the findings of modern science. The Anti-Defamation League [ADL] of B'nai B'rith [BB] was founded in 1913 from its father organization the B'nai B'rith. The B'nai B'rith promoted socialist and egalitarian revolution. It was founded in the decade of The Communist Manifesto amid widespread unrest throughout Europe. From that time Jewish chauvinism, communism and Zionism were all intertwined.

The confounding and confusion of Semitism and socialism that occurred at the beginning continues to the present day. Anti-liberalism is apparently often confused with anti-Semitism within the present-day Jewish community. To illustrate, in the newsletter Details for July 1997, published by "The Jewish Policy Center", Rabbi Daniel Lapin explained why he thought anti-Semitism and Jewish liberalism are intertwined: "They realize that liberalism . . . is largely responsible for the fact that life in America has become more squalid, more expensive and more dangerous over the past 30 years. Thus, many decent Americans are disturbed by Jewish support for liberalism and liberal causes. Though virtually all Americans are too decent to let this blossom into full-fledged anti-Semitism, there is always that threat. We can 'tweak the lion's tail' only so long." (p.1-2).

Early on, Jewish intellectual leaders boasted of the racial distinctiveness and superiority of the Jewish people. Only later did the strange strategy evolve that Jewish distinctiveness could only be preserved by eliminating distinctiveness among non-Jews. Franz Boas and other Jewish intellectuals believed that the Jewish people would only be safe with the elimination of all vestiges of racism among the Gentiles. From there, it was a short step to using other groups in furtherance of the Jewish agenda, such as founding the NAACP, and adopting cryptic "behind the scenes" financing and control of Black and Gentile front organizations. David Duke provides many of the references, in the Jewish triumphalist literature.

The Anti-Defamation League may have been founded to counter bigotry, sadly it has transformed into one of the most bigoted of organizations. Wielding the two mega-smears of "racist" and "anti-Semitic" it attacks whomsoever it dislikes. Just as Peter Brimelow (in Alien Nation) pointed out that the new definition of "racist" is anyone who is winning an argument with a liberal," so an "anti-Semite" has become anyone out of favor with the ADL.

One of the most chilling documents that I have encountered in many years is B'NAI B'RITH Reports and Analyses (available on the Internet at bnaibrith.org). It goes on for page after page listing legislative initiatives in many countries to criminalize -- whatever they dislike! Much of what Voltaire and the American First Amendment is dedicated to, as well as Thales' approach to civilization, are completely alien to this mindset. Dislike a book (there are quite a few titles that are disliked), criminalize its distribution. Go to jail for possession Speech -- say something

insensitive or unpopular, go to jail and pay a fine. Newspaper--shut it down, go to jail, pay a fine, for possession or distribution Question a "sacred truth" of History --don't you dare, go to jail, pay a fine, lose your passport, no visa. Distasteful symbols, flags, jewelry --go to jail, etc. etc. What they have not yet managed to have outlawed, they say they are now "monitoring." And these same people are avidly pushing for federalization of newly invented crimes and "hate offenses" in the United States. The activities listed in this document, if nothing else, would induce me to heartily recommend the book written by David Duke.

As we approach the beginning of the third millennium from the birth of Jesus, western society is poised on a cusp. We are toying with a path that leads to another Dark Age; a possible millennium of censorship, speech codes and hate thought laws. Blasphemers, free thinkers and honest people could be suppressed. Thought-crime and hate-speech law advocates are substituting ideological suppression for honest science. We could fall into another totalitarian Dark Age, or rational freedom could prevail. The balance of past history does not encourage blind optimism. Alternatively, the path from ancient Greek philosophy to freedom and modern science, which is unique to Western Christian Civilization, could lead to a greater Golden Age.

As a scientist who specializes in the field of Behavioral Genetics, I must tell you that I have gone over David Duke's considerable data on genetics and race and find it in line with the latest scientific discoveries and knowledge in this area. His grasp of this area of research is quite remarkable for having a degree in History rather a doctorate in the biological disciplines. As to the meaning he poses for the racial truth he tells, politics is his realm, not mine. But, it is fascinating to see how his political life has been an outgrowth of an intimate relationship with the natural world as a child, and then later his study of it in scientific books and extracts.

As I read this book and prepared for this preface, one word kept coming to my mind: powerful. Indeed, even though I know that contributing this preface could lead to some discomfort from those who hate free speech, it seemed to me that this book was more than just a book. It is a painstakingly documented, academically excellent work of sociobiological-political history that has the potential to raise tremendous controversy and change the very course of history. My Awakening has the prospect of becoming to the race issue, what Wealth of Nations is to capitalism or Das Kapital is to Marxism. Moreover, David Duke's notoriety gives this book the chance to be read. It will not easily be hidden away.

What of politics, and what of David Duke? About the path of politics from the cusp on which we are perched, I cannot say. Scientists have never been particularly adept at politics. History could come to treat David Duke in many different ways. Perhaps he will be remembered as a Moses-like prophet who upon awakening them, led his people out of bondage. Perhaps he will be remembered not at all: down George Orwell's memory hole as civilization sinks into another Dark Age. Perhaps he will be remembered as a John-the-Baptist, a wee bit too early, one who awakened his people and paved the way for the future.

"Stand Up and Tell the Truth," a line from this book, could just as well be the title of this remarkable autobiography from a remarkable man. He has had the courage to live it and to write it, to lay down on paper the results of a lifetime of study, reflection and activism. We can only hope that many of his fellow citizens will have the courage to read and discuss it.

Gladye Whitney, Tallahassee, August 1998 (Gladye Whitney is a past president of the Behavior Genetics Association).

Tracing the Genetic History of Modern Man

Cavalli-Sforza, L. L., Menozzi, P., & Piazza, A. The History and Geography of Human Genes (Princeton: Princeton University Press, 1994)

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Abstract

This massive compilation of genetic data on the populations of the world, by documenting the genetic similarities and differences, shows that "races" exist while simultaneously denying the usefulness of the concept. In the course of doing this the book present much useful information about similarities and differences in gene frequencies among the populations of the world. The data is presented in many useful formats including tables, maps, dendograms (descent trees), and principal component diagrams. The interpretation generally presumes neutrality for the various genes, and many interesting conclusions are drawn about the evolutionary history of various populations around the world.

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Cavalli-Sforza, Menozzi, & Piazza's (1994) new *The History and Geography of Human Genes* is a very impressive compilation of what is known about the geography and history of human genes. It will be a definitive work of racial analyses (although the authors would not describe it this way). About half of the book (the back half) is an atlas showing of the distribution of a large number of genes for each of the continents, and for the whole world. The extensive atlas section is probably what makes the book so expensive (\$175 as advertised), and will unfortunately limit its purchase to libraries, and a few individuals working in the field, who will feel it is an indispensable. It might have been better if the publishers had brought out two books, one the atlas, and the other the text. This would have made the text more compact, and made the book less unwieldy to handle.

There is also an extensive set of tables giving information on allele frequencies for many genes and populations. This data base is compiled from examining 2900 articles from 136 journals (although only 777 involved unduplicated data, listed in the references). It is the mapping and interpretation of this massive amount of data that makes the book so impressive and valuable. Unfortunately, the data compilation is already somewhat obsolete as it only goes to 1986 (p. 25).

The book is organized on a geographical basis, with one introductory chapter, one chapter on the world wide distribution of genes, and then separate chapters on Africa, Asia, Europe, 2 (Australia, New Guinea, and the Pacific Islands), and the Americas. The introductory chapter is a valuable compilation of material about genes, anthropology, archeology, human evolution, and the methods of quantitative genetics. The authors recognize that the book will be used by people who are not experts in all these fields. The introductory material is useful to those lacking training in one or more of these fields. However, the specialist will probably learn little from the sections on his own specialty. A brief section on the "Scientific Failure of the Concept of Human Races" attempts to divert criticism for even studying the subject of how gene frequencies differ across the world (although it probably does reflect the author's true beliefs). Much of the book seems to contradict the anti-race assertions in this section, but it is an effective argument against the most naive ideas of race.

The last half of the first chapter contains useful discussions of such subjects as the problem of identifying populations, and some of the methods that will be used in the rest of the book. Greater detail, and an effort to put the methods into simpler language would have been useful for the general reader.

The second chapter summarizes the data on the world wide distribution of genes. The basic theoretical framework in this book is that gene frequencies are determined by drift. Offspring randomly inherit genes from their parents. The child has a 50% chance of inheriting any given gene from each parent. Many who are not used to thinking in genetic terms think that any trait affected by the genes must be rigidly inherited from the parents. In actuality, because of the random inheritance of genes, genetics provides a theory of human diversity, and helps explain why siblings are usually quite different (Rowe 1994). In small and somewhat isolated populations, such as humans are believed to have lived in during prehistoric times, gene frequencies change appreciably, but randomly, from generation to generation. Over many generations (perhaps 100,000 years) different populations develop different gene frequencies.

As mentioned, one contribution of the book is the extensive table of gene frequencies. The world wide section is based on data for 120 alleles from 42 populations, (although data was not available for all alleles for all populations). A certain amount of averaging of data from different sources was needed to get the relevant gene frequencies, and the data is often for national groups in Europe (such as the English or Danes), and groups of tribes or regions in other parts of the world. Unfortunately, after combining various populations, there is more data than can be easily comprehended. It is helpful that the maps at the back of the book permit the Kreader to get a quick overview of how any allele is distributed.

The Tables of Genetic Distances

A method for simplifying the data is to calculate measures of genetic distance. One of the interesting features of the book is the numerous genetic distance matrices it includes, permitting

one to see how closely various populations are related. Before various statistical adjustments, these are the sum of the squares of the differences in frequencies averaged over the various genes. Under a random drift model the distance should be roughly proportional to the time since populations divided, assuming the populations did not differ in size, and the genes were not subject to appreciable selection. Distances are usually calculated as F_{st} distance, although Modified Nei's distances are given for the worldwide sample of 42 populations. The F_{st} measure would be 0 if all available gene frequencies were equal, and 1 if they were all completely different (i.e. if every member of one population always had one allele, every member of the other population would lack it.)

These measures of genetic distance are of some interest in their own right. In general one would not expect large differences in frequencies for a particular gene between two populations, if for most genes there is only a small difference in frequencies between the two populations. For instance, anyone arguing that the French and the Germans differed for genetic reasons, would have to contend with the evidence presented here that these two populations are genetically very similar.

Use of genetic distance permits summarizing the worldwide data in a single triangular 42 by 41 matrix. The largest difference in the table appears to be 4573 between the Mbuti Pygmies and the Australians (i.e. the Australian aborigines). In tables the numbers are multiplied by 10,000 for convenience in presentation. Thus, the Pygmies appear to have 45.73% of their polymorphic genes different from the Australians. Thus, it appears that for all pairs of human populations, the majority of the genes will be in common, even if one picks genes whose alleles differ among individuals. Of course, there are a much larger number of genes that appear to have no known variation among humans.

Most of the data is for genes that are either neutral, or close to neutral. In particular, none of the genes discussed are known to affect such genetically controlled characteristics as skin color, hair color, eye color, nose shape, or size. All of these characteristics are known to differ greatly between populations. Likewise, none of the studied genes are known to directly affect such socially important traits as intelligence, criminality, etc (although many such traits are now known to exhibit genetic variability, see Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; Eaves, Eysenck, & Martin, 1989; Herrnstein & Murray, 1994; Miller, 1994a,b; Rowe 1994; Rushton, 1994).

The data for the English, as a population many Americans trace their origins to, can be used to illustrate the nature of the data. In the worldwide sample of 42 populations, the population closest to the English is the Danish (21), and the one most distant the Mbuti Pygmies of Zaire (2373). More important African populations include the Bantu (2288) and the West Africans (1487). For purposes of comparison, the genetic distances between the English and the Japanese is 1244, between them and the South Chinese, 1152, and between them and North American Indians, 947. Estimates of standard errors are provided by the bootstrap method. These estimates

indicate that it is unlikely that studying additional neutral genes will change the conclusions that the English have different gene frequencies than these populations.

The genetic distances between the English and other European populations are small. The two greatest are 404 for the Lapps, and 340 for the Sardinians, two populations that contributed few immigrants to the United States. With major European populations, 22 with the Germans, the distances are 24 with the French, 51 with the Italians, and on up to 204 with the Greeks. In comparison with the much larger genetic distances from the Bantu and West Africans, or the Japanese, South Chinese, or American Indians, the European populations do indeed seem similar to each other. Unless the genes that affect various types of behavior have a frequency difference radically different from the studied genes, genetic differences in behavior between European populations should be small.

Likewise, the various West African populations are similar to one another. The average distance between the various West African tribes is 157, and 211 among the Bantu groups (p. 184). A representative Bantu to West African distance is 188 (p. 175).

Given the large genetic distances between most Europeans, and most Africans, and the similarities within the populations that American slaves and immigrants were drawn from, it does seem reasonable to divide most of the immigrants to America from either Africa or Europe into one of the two conventional groups: Blacks and Caucasians. It is also logical to believe that large genetic differences still exist between the two races. Because the two original groupings differ greatly in skin color, it is to be expected that skin color will convey information about the probability of carrying certain genes, even if population differences in frequency are due only to drift (which is the working assumption for the genes discussed in this book). If the alleles have been subject to climate related selection, as has been argued to be true for intelligence and many aspects of behavior (Lynn, 1991; Miller 1991, 1994; Rushton, 1994), the genetic differences are likely to be larger. Although some would like to argue that knowledge of race is of no use in estimating the probability of someone having a particular trait, a rather simple application of Bayes Theorem shows otherwise. Bayesian statistics show that the posterior estimate should be a weighted average of the information about a particular individual, and the mean for the race he is a member of, with the weights depending on the relative precisions of the information about the individual and the group (Miller 1994c).

Trees of Human Descent

A matrix of genetic distances contains too much data to be readily understood. The data is further presented as dendograms, referred to as trees in the book. Thus, in this section, and in the remainder of the book there is extensive presentation of trees. The populations that are on the same branches are more closely related (as shown by the table of genetic distances). Trees are generally interpreted as having been created by the original human population having divided and subdivided. A rough calibration is attempted from the estimated times of the movement of

modern humans out of Africa, and the settlement of Australia and the Americas. The length of the branches leading are portrayed as the relative time since the populations separated. This is not always true, as the authors recognize, since gene frequencies are more affected by drift in small populations, and gene flow between populations makes them more similar even if they had separated many years ago.

Insert about here Fig. 2.3.2.B from p. 79 of book

The African versus all Other Split is Primary A key presentation of the authors results (p. 78) shows trees of 42 populations using frequencies for 120 genes, with genetic distances calculated by two different methods. In both of them, the first split separates African populations from non-African populations. Experiments with bootstrap methods (sampling with replacement from the available data pool to discover how sensitive the conclusions are to changes in the set of genes examined) show that the core African populations (Bantu's, Nilo-Saharans, West Africans, and Mbuti Pygmy) group together 83 and 84 times out of a hundred, showing minor variation in genes studied is unlikely to change the conclusions. When the 42 populations were grouped into nine clusters, Africans versus non-Africans was the first division, and this was true for 98% of the bootstraps (p. 80).

It may be noted that this represents a change from the first results published earlier (Edwards & Cavalli-Sforza, 1964, discussed by Cavalli-Sforza et al., 1994, p. 68), which put the first split between a Caucasoid/Negroid grouping and all others. The gene frequency data available then showed the Caucasoids to be more like the Negroids than the Mongoloids. The shift by the Cavalli-Sforza group from grouping the Mongoloids with the Negroids (which would be consistent with modern humans originating in Asia, followed by a branch moving westward, and then subdividing into groups that passed into Africa and into Europe) is explained by the much larger number of loci that are available now, rather than any major methodological difference.

Incidentally, although Cavalli-Sforza et al. here use the terminology of Africans, Europeans, and Asians, it is clear from the populations included in each group that what they really mean is Caucasoids, Negroids, and Mongoloids. They refer to taking three populations from each continent (p. 68), but the tree (p. 68) shows only two populations from the continent of Europe (the English and the Lapps). The South Turkish were one of the sampled populations, appearing on the same branch as the English. The South Turkish are actually located in Asia (i.e. they are Asian), although they are Caucasoids closely resembling other European populations in gene frequencies. Accuracy and clarity would be improved if the standard scientific racial terms, Caucasoids, Negroids, and Mongoloids, were used, instead of appropriating the well-established terms traditionally applied to those from particular continents, Europeans, Africans, Asians, and giving these terms new, and unusual meanings. Incidentally, later the book uses Caucasian (Fig. 4.10.1 on p. 225) to mean someone from the Caucasus mountains, an accurate usage, but one that could lead to confusion for an unwary reader who only looked at single trees.

There seems to be a general agreement emerging that the first split in the tree of human descent is between Africans and all others. This has been shown by several different methods. As noted, it is what would be expected if modern humans originated in Africa, then moved into the Middle East, and only later divided into other populations.

Nei & Roychoudhury (1993) using 26 populations with the same genes for all populations and a different methodology (neighbor joining) than the Cavalli-Sforza group found that the first split was between Africans and non-Africans, a result that was confirmed in 500 bootstrap replications. The split is again African versus non-African using the same 26 populations but a different tree building method (unweighted pair group method with arithmetic mean). In a test with 15 populations but with more loci (33 loci and 131 alleles), their first split was again between Africans-and non-Africans.

Nei & Livshits (1989) by examining only the three major groups of sub-Saharan Africans (mainly from Nigeria and Cameroon), Europeans (mainly Great Britain), and Asians (mainly Japanese) were able to examine 186 loci, which gave enough data for tests of statistical significance. They found that the distance from the Africans to the Europeans was statistically significantly greater than that from the Europeans to the Asians, even though geography puts Great Britain closer to Nigeria and Cameroon than it is to Japan.

Mountain, Lin, Bowcock, & Cavalli-Sforza (1993) show a tree resulting from using 80 DNA markers on eight populations. The first split is between Africans and non-Africans. The tree of Zhao and Lee (1989) agrees that the largest genetic difference is between Africans and all other populations.

A study of a restriction enzyme haplotype close to the b-globin gene showed "all non-African populations share a limited number of common haplotypes, whereas Africans have predominantly a different haplotype not found in other populations. A genetic distance analysis based on these nuclear DNA polymorphisms indicated a major division of human populations into an African and an Eurasian group" (Wainscoat, Hill, Thein, Flint, Chapman, Weatherall, Clegg & Higgs, 1989, p. 34).

Torrioni, Semino, Scozzari, Sirugo, Spedini, Abbas, Fellous, & Santachiara Benerecetti (1990) reported a sharp distinction between Africans and Italians using markers on the Y chromosome. Hammer (1994) has reported a Y chromosome marker (which implies inheritance only from males) which had a frequency of .74 in 611 Africans, but only .07 in 192 Europeans. A tree showed that the first split was again African versus non-African (although the Egyptians grouped with the Africans).

Similar conclusions have been reached by other workers using other genetic markers. Relethford & Harpending (1994) show that a tree constructed using craniometric variation has the first split

between Africans and all-others.

Other Splits in the Tree

While the first split in the tree is clear and appears to be well established, the second split is a little surprising. With the preferred set of distance measurements (F_{st}), the non-Africans split into Australians, and all others, and then into Southeast Asians, and the remainder. Only then do the Caucasoids separate from the Northeast Asians, Arctic Asians, and American Indians. Using an alternative method for calculating genetic distances, Nei distances, the non-Africans first split into an Australian, and Southeast Asian group, and a Caucasoid, other Asians, and American group. Then the Caucasoids split from the Northeast Asians, Arctic Asians, and Americans. Combining the 42 populations into nine clusters (which increases the number of loci that can be used and reduces the importance of random drift), the non-Africans are then split into a group combining the Australians, Southeast Asians, and Pacific Islanders and into a group including the Caucasoids, Northeast Asians, and Americans.

The results here are surprising since the Northeast Asians (including Japanese, Koreans, northern Chinese) and American Indians are found to be relatively close to the geographically distant Caucasoids, rather than to the Southeast Asians, who are much closer. This is not what many might have guessed from either the geography or from the similarity of the populations in appearance. Interestingly, detailed inspection of the trees, and the distance matrices show that the Southeastern Chinese (i.e. Hong Kong and vicinity) group with Southeast Asians such as the Filipinos, rather than with the Northern Chinese.

Such an outcome is not impossible. One could imagine the early Middle Eastern population giving birth to a group that moved eastward into Southeast Asia and then on to Australia and New Guinea. Later the Middle Eastern population might have given birth to groups that became the Caucasoids, Northeast Asians, and American Indians.

The authors conduct bootstrap experiments (which in essence repeat the calculations with different sets of genes to see how sensitive the conclusions are to the particular set of genes for which we have data). The conclusions do appear to change depending on the set of genes studied, and the authors suggest that one cannot be confident of the exact order of separation between the branches leading to the Caucasoids, the Northeast Asians, the Southeast Asians, and the Australian and New Guinea populations. They attribute much of the uncertainty to extensive gene flow between Northeast Asia and Southeast Asia, making it hard to produce a tree that fits the data well.

The chief alternative to the extensive calculations undertaken by the Cavalli-Sforza group is another set of calculations done by Nei & Roychoudhury (1993). As already mentioned, these calculations agree that the first split is African versus non-African. However, they place the second split between the Caucasoids and the Greater Asians (Australians, Mongoloids,

Americans). The trees they produce correspond very closely to the races as they have been traditionally understood, with their tree grouping populations into groups that are easily recognized as Negroids, Caucasoids, Mongoloids, Amerindian, and Australians. About the only difference from traditional races is that the branch of the tree that leads to the Mongoloids also includes the Australians and New Guinea groups. However, these are on a separate branch. Nei & Roychoudhury discuss why they get a somewhat different tree than Cavalli-Sforza et al. and conclude it is because they use a different method for building trees, neighbor joining, while Cavalli-Sforza et al. use an average linkage method. Nei & Roychoudhury present some cogent reasons for preferring their methods.

Most of the interpretation of the data by Cavalli-Sforza et al. is one of genetic drift, (i.e. the random changes in gene frequencies that occur from one generation to another). The implicit assumption is that population mixing has played little role. However, they do recognize that the theory that observed differences in gene frequencies are due to drift is, at least in principle, testable. For instance, if there is no mixture after separation, all populations that are descended from the same parent population should have approximately the same genetic distances from the various populations descended from another parent population (see table on p. 90). This condition need not be met where there is appreciable gene flow between populations. In general we would expect adjacent populations to exchange genes, and to be more similar than non-adjacent populations.

Certain methods of tree construction produce trees the length of whose branches from the point of origin indicates how much genetic separation has occurred since the populations separated. If the populations are evolving at the same rate, all the branches from a common point should have the same length. Very often this condition is not met.

Perhaps the most striking exception to the predicted pattern is that the branch leading to Europeans is often relatively short. One of the most interesting studies discussed in the book is one that analyzed only a small number of populations (including Chinese, Europeans, two populations of African pygmies, and Melanesians), but collected data on a very large number of alleles. A tree constructed using this data showed a very short branch leading to the Europeans (p. 91). Several explanations were considered, but the most plausible was mixture. Calculations showed that the European gene frequencies could be explained well by a mixture of the Chinese with a smaller percentage of the pygmies. Obviously, this is not the actual racial history of the Europeans (who are both taller and lighter skinned than either group for instance). The pygmies are fairly close to other Africans in the frequency of their measured genes (the set of measured genes frequencies appears to include no genes that affect height) according to the data in this book.

The evidence that Europeans gene frequencies tend to be intermediate between Africans and Chinese is interesting to those (including the author of this article) interested in behavioral differences between races. Rushton (1994) has presented evidence that on a wide range of

characteristics, including intelligence and sexual behavior, the races are ordered Mongoloid, Caucasoid, Negroid. He interprets this as evidence for his differential K theory, while the author of this paper interprets this same pattern as evidence for his paternal investment theory (Miller, 1994a,b). Both have interpreted the fact that so many characteristics had the same pattern as a systematic regularity that called for explanation. It was most easily explained by an evolutionary mechanism, probably taking the form of a common climate related factor producing differences such that the Africans were at the tropical end (or the variable and unpredictable end in Rushton's theory) and Mongoloids at the other end (cold in Miller's account or predictable in Rushton's) with Caucasoids in between. Of course, if Caucasoid's gene frequencies are simply a result of mixtures of two other stocks, the regularity might be explained in other ways (although of course Miller's or Rushton's explanations could still be accurate).

How might European gene frequencies come to be part way between Chinese and African? Part of the explanation is simply geographical. The Caucasoids are located in between the territory of the Negroids and the Mongoloids, and presumably have received genes from both groups. The term Caucasoid is used instead of merely European because it is the Middle Eastern and Indian Caucasoids who are best located to exchange genes with both the Negroids and Mongoloids.

However, a theory of Ammerman & Cavalli-Sforza (1973), discussed in this book (p. 108) provides a mechanism for how the Europeans could come to be intermediate in gene frequencies. They argue on the basis of archeological evidence and gradients of gene frequencies in Europe that agriculture, after emerging in the Middle East, spread into Europe by demic diffusion. By demic diffusion is meant that the early farming populations expanded gradually with each new generation moving further into Europe, with the average rate being about one kilometer per year. The alternative to this account is that the technique of farming diffused without movement of peoples.

Some of the more fascinating work reported in the book is the explanation of gene frequency distributions by the hypothesis of demic diffusion of agriculture. The authors compute first principal components for European gene frequencies. For those not familiar with statistics, the first principal component is a single statistic which condenses as much information as possible about the gene frequencies into a single number. When plotted on a map the component increases systematically with distance from the Middle East. This is explained by the gradual advance of a Middle Eastern farming population into Europe. Its gene frequencies were different from that of the original Paleolithic population of Europe. When ever two populations are in contact there is some interbreeding, and genes from the original European populations gradually diffuse into the advancing farming population. It is a fascinating hypothesis, and the use of principal components to support it is ingenious. Many individual genes are distributed as if they had been imported by a population advancing into Europe from the Middle East, with the wave gradually becoming more mixed as the intruding population mixes with the original inhabitants of Europe.

Such an account agrees with what we know about primitive agriculturalists and foragers. Foraging populations are typically very low density, while farming can support much higher densities. Furthermore, a shift to agriculture can plausibly increase the population growth rate, permitting densities to rise rapidly. One of the limitations on population growth in migratory foraging societies is the mother's inability to carry more than one baby at a time. This prevents her from having the next child (or from permitting it to survive) until the first can walk. Thus, births are spaced about four years apart.

In sedentary farming populations births can be more frequent, permitting the population to grow, at least when there is adequate fertile land for expansion. As the population grows, villages every so often become too large and split, with one group leaving to establish a new village. This new village would have been frequently located in a new unsettled area.

Settled farming is a way of life that is quite different from foraging, and one that is in many ways physically harder. Evidence from contemporary foragers shows that they are reluctant to adopt agriculture, and a settled way of life as long as foraging provides an adequate income. Foragers and settled farmers appear to have lived in the vicinity of each other for long periods of time without the foragers taking up agriculture. It also appears that while there is some gene flow between such populations, they basically stay separate.

Thus the Cavalli-Sforza et al. account of demic diffusion of agriculture is plausible. They do illustrative calculations showing that the observed rate of advance (as measured from archaeological sites) is about what would be expected from such a demic expansion (p.108).

Besides its intrinsic interest, what is the importance of whether agriculture in Europe was introduced by demic diffusion or by cultural diffusion? If it was by actual movement of peoples, the current inhabitants of Europe are to a large extent Middle Easterners, rather than descendants of the original Paleolithic inhabitants. Because farming supports a much higher population density, the impact on gene frequencies would be quite large from such an invasions of farmers.

As was noted earlier, gene frequency data suggest that European's gene frequencies appeared to be about what would result from a third African and two-thirds Asian mix. While this mixture could occur by direct diffusion into Europe from Africa or Asia (and undoubtedly there were such gene flows), it is easier to understand if the ancestors of Europeans were originally in the Middle East, possibly even Israel (where there is evidence of a settled culture that stored wild grain, which could have easily shifted to cultivating grains.) Such a population would have been receiving genes from Africa via the Isthmus of Suez (and possibly across the Red Sea) and from Asia.

The evidence of demic diffusion also casts light on the climate in which Europeans evolved. It is a commonplace in evolutionary psychology (also called sociobiology) that the human psychology (and body) was shaped by the extremely long period in which people were foragers,

and that we are probably adopted for reproductive success in what is often called the environment of evolutionary adaptation. However, a little thought will show that these environments varied in different parts of the world and ranged from tropical to the cold of Ice Age Eurasia.

The author of this article has argued elsewhere (Miller 1994a, b) that in tropical areas vegetable food was available year around. It has become a common generalization that in hunter-gather societies most of the calories come from gathering and that most of the gathering is done by women, and that the total number of hours expended are low (Lee, 1968). However, examination of the societies used to establish this generalization shows that they were typically tropical societies. In such tropical areas, the females can gather enough food to support themselves and their children. The optimal male strategy is to devote efforts to mating with as many females as possible, and preventing other males from mating with the women he is mated to. Provisioning females and their children is not as strongly selected for (since they will survive in any case).

In Eurasia, the major problem is surviving through the winter when fruits, berries, insects, eggs, and hibernating and migratory animals are unavailable. The common solutions are storage of food (which leads to selection for the ability to defer gratification and for intelligence, see Miller 1991), and the hunting of large animals, such as deer. Unfortunately, women are not effective hunters of large animals (just imagine trying to hunt while carrying a crying baby). Thus, males become the primary supporters of their families during the winters. Females are then selected to look for and attract males who will provision them and their children. Males are selected to form strong pair bonds and to have the personality traits that lead to provisioning.

The ancestors of the Negroids were tropical Africans, and the ancestors of the Mongoloids and Caucasoids were from the cold climate regions of Eurasia. Furthermore, to explain the stronger pair bonds of Mongoloids and other attributes it is necessary to argue they evolved in colder climates. Their stockier build and other features are consistent with this.

That Negroids evolved in tropical Africa, and that Caucasoids and Mongoloids evolved in cold Eurasia is readily accepted. However, some have found it harder to believe that the environment Caucasoids evolved in was appreciably warmer than that for the Mongoloids, especially since there has been extensive publicity given to accounts of Ice Age Europe. It was definitely very cold. Its inhabitants hunted such animals as reindeer and woolly mammoths.

The demic diffusion model makes it likely that the ancestors of modern Europeans were not primarily Ice Age Europeans, but paleolithic Middle Easterners. The gene frequencies of modern Europeans were shaped not only by the cold conditions of Ice Age Europe, but primarily by the conditions in a somewhat warmer Middle East, possibly even in Israel. In turn, the gene frequencies here were influenced by genes diffusing across the Suez Isthmus from Africa.

What happened to the original paleolithic inhabitants of Europe? To a large extent they were absorbed into the populations of the advancing Middle Eastern farmers. However, the evidence presented in this book suggests that the existing population that is closest to the original Europeans is the Basques (p. 276).

If the expansion of Near Eastern farmers affected gene frequencies in Europe, it might have affected gene frequencies into which this farming could have spread (pp. 221-222). Since the book was published, Barbujani, Pilastro, Domenico, & Renfrew (1994) using gene frequency data to argue that not only do European gene frequencies suggest demic diffusion from the Near East, but evidence of such demic diffusion can also be found among the areas once occupied by the speakers of the Altaic languages, and the Asian speakers of the Indo-European and Elamo-Dravidian languages, although only weak evidence was found among the speakers of the Afro-Asian languages.

Other Interesting Findings on the World Wide Gene Distributions

After deriving trees of descent, Cavalli-Sforza et al. compare these with the distribution of language families. They conclude that they are similar. This is not surprising since both languages and genes are argued to spread by the repeated splitting of populations, followed by independent evolution of gene frequencies and languages. Also, people tend not to marry those speaking different languages, and linguistic differences become barriers to gene flows. It should be noted that Nei & Roychoudhury (1993), constructing their trees in a somewhat different manner, found a less close correlation between genetic groups and languages.

Conclusions from Principal Components

Another way the massive amount of data in the table of genetic distances can be condensed is to calculate principal components. In essence, the first principal component is a number which summarizes as much information about gene frequencies as possible. After this is done, a second component can be calculated which summarizes as much as possible of the remaining information and so on. Principal components do not always exist. If the frequency of one allele was completely independent of the frequencies of other alleles, principal components would not exist to be calculated. Principal components are used in other fields. For instance, in psychology the first principal component from a battery of tests is traditionally called *g* (for general ability), and is usually what the psychometrician means by intelligence.

The first two principal components explained 27% and 16% of the variance respectively (p. 81). Thus there is a high degree of patterning in the distribution of gene frequencies. A graphics technique places the populations on a two dimensional diagram with the first principal component along the base, and the second on the vertical axis. As the authors note, the African populations are in the lower right hand quadrant, and all of the Caucasoid ones are in the upper

right hand quadrant. The ones traditionally called Mongoloids are in the left hand side of the diagram, along with the Australian and New Guinean ones. It appears that modern gene frequency data when analyzed with modern sophisticated statistical methods produces something that looks very much like the traditional concept of races. The chief exception is that the Australia and New Guinea populations are in the middle of the left hand side, with populations traditionally considered Mongoloid both above and below. As in their preferred trees (trees and principal component diagrams are merely different ways of simplifying and presenting visually the same information), the Mongoloids seem to fall into a group at the upper left hand corner (including the Japanese, Koreans, Mongols, Ainu, and American Indian groups), and then in the lower left hand quadrant another group including South Chinese, Thai, Indonesians, Malaysians, Filipinos etc.).

As an aside, the reader may note that the second principal component seems to divide populations somewhat by the climatic area in which they are found with the Negroids, South Asians, Australians, New Guineans being at the bottom of the diagram, and the Caucasoids, Northeast Asians, and American Indians groups being at the top. It is possible that the genes that play a large role in determining the second component are ones that are subject to natural selection that is somehow related to climate (possibly through the effects of tropical diseases).

The reader may notice that certain populations that have contributed heavily to the populating of America are close together on the chart. In the upper right hand corner, the Italian, Danish, English, Greeks, (and Iranians) are very close together. Reference to the chapter on Europe shows that most other European populations (such as the Germans, French, Dutch) that helped populate America are very similar to the populations plotted here.

Place Here

Diagram 2.3.5, p82 for book as modified to show where racial groups fit in.

In the lower left hand corner, the Bantu and West African populations come out to be very similar. The European group and the African group are as almost as far apart in the second component as it is possible to be. While the studied gene frequencies do not affect the appearance of individuals, it is plausible that if they did, the difference between the Europeans and Africans would be immediately apparent, and that words would emerge to describe them. Of course, these two population are sharply separated in skin color and other aspects of appearance (due to other genes), and it is not surprising to find that this difference in appearance has been noticed. People of the two original continents are referred to as white and blacks, Afro-Americans and Euro-Americans, Caucasians and Negroes etc. The second principal component does a good job of separating the two groups of peoples.

There are populations that lie between the two above described clusters. The Berbers are about half way between on the 2nd principal component, and the San and East Africans much closer to

other Africans. It is very plausible that these groups located in Africa reflect differing degree of Caucasoid admixture with an African stock. This possibility with regard to the San is discussed in the African chapter. Since these groups contributed relatively little to the populating of America, an impression of a sharper distinction among those of unmixed ancestry than actually exists in the Old World could be created.

One might ask what can principal component maps indicate. The authors argue that when two populations intermingle, all gene frequencies are shifted proportionately in the same direction. As an illustration (not discussed in the book) consider the problem of estimating the percentage of Caucasian intermixture in the African-American population. Consider one gene. The Duffy is a good one, and one that has been classically used. This gene is very frequent in Caucasians but virtually unknown in West African Negroes. The percentage of this gene in an African-American population could be, and has been used, to estimate the percentage of Caucasoid intermixture. If a fifth of the ancestors of the Negroid population were Caucasoids, the frequency of the Duffy gene would be one fifth as high as in Caucasoids. Thus, from one gene, admixture could be estimated. More generally when two parent populations are mixed, the gene frequencies will be $w_1f_1 + (1-w_1)f_2$, where w is the percentage of the daughter population that the first population contributed, and f_1 and f_2 are the respective gene frequencies. Gene frequencies are always being subjected random changes (drift) and the effects of selection. Thus, one will get slightly different answers depending on the genes studied. The obvious solution is to examine many genes and take an average. Once one had the frequencies of admixture, one could plot them on a map. The first principal component would give a good depiction of the percentage of the invading population in the old. This method would work even if one did not know the populations being mixed. As mentioned, Cavalli-Sforza et al. make good use of a first principal component map of Europe to argue that the observed pattern can be explained by varying mixtures of two populations, an original foraging one, and an expanding Middle Eastern farming one.

Now suppose that one had three populations. One might first compute the gene frequencies to be expected in each of the populations that were mixtures of the first two. The differences between the frequency that could be explained by the mixture of the first two populations, and that observed, might be attributed to mixture from the third. Since the second principal component is constructed to only use information not in the first principal component, its values should indicate the extent of admixture with the third population.

Cavalli-Sforza et al. claim to have conducted simulations which show that the effects of expansions of ancient populations will indeed leave evidence on the principal component maps. Notice that there need be no written evidence of an expansion of the original population, nor does the name of that population, or its gene frequencies have to be known.

In several cases the principal component maps consist of roughly concentric circles, which can be interpreted as indicating mixing with surrounding populations of an original population that

underwent a prehistoric expansion. In the discussion, they draw attention to some of the patterns and speculate about what populations might have expanded.

The expansion out of the Middle East with the coming of agriculture is an example that has been discussed. They interpret a pattern of concentric circles around the Sea of Japan as possibly indicating an expansion from that area, possibly of a people similar to that of the prehistoric Jomon culture in Japan (p. 249). Similar maps for Italy are interpreted as possibly providing evidence of the diffusion of the genes of the original Etruscans, who may have come to have a distinctive pattern of gene frequencies through either drift in a small original population, or by immigration to Italy from another area (p. 279).

The book provides principal component maps for the first few principal components both on a worldwide basis, and in each separate continental chapter. Cavalli-Sforza et al. have devised an effective and ingenious mechanism for combining the data provided by the principal components into color maps (used earlier in Menozzi, Piazza, & Cavalli-Sforza, 1978). The human eye can distinguish three primary colors, and by using a separate primary color for each of the first principal components, a map can be prepared which shows the first three components, (which appear to explain about half of the total variance in gene frequencies). The result is some very interesting color maps. One of these is used for the book's dust jacket .

Race

This may be a good place to comment on the views of the authors on race. In the first chapter there is a discussion of "The Scientific Failure of the Concept of Human Races" (p. 19). This opens with the statement that "The classification into races has proven to be futile exercise for reasons that were already clear to Darwin." The reference is presumably to Darwin's knowledge that the races grade into one another, making easy distinctions impossible.

The authors make the point that the measured genetic variability within populations is greater than the variability between populations, which is correct. However, they fail to point out that none of the traditionally studied genes are the ones that relate to such variables as skin color, or nose shape, which are genetic variables that show great variation between populations. It is very likely that many of the genes affecting these traits have gone to fixation in many populations (judging from the absence of dark skin in Swedes, and the absence of non-albino lightly pigmented individuals among the Liberians). At this point, not knowing just which genes influence socially significant traits, we do not know exactly how much of the variation on these traits is between populations, and how much within, although a good guess is that most of the important variation is within populations.

The book states that (p. 19) "However, the major stereotypes, all based on skin color, hair color and form, and facial traits, reflect superficial differences that are not confirmed by deeper analysis with more reliable genetic traits. . ." However, the evidence in the rest of the book

serves to disapprove this statement. It has already been pointed out how the trees were calculated, and that the principal component diagrams classify populations in such a way that groups corresponding to races can readily be recognized. The map on the cover makes it easy to recognize the territories of the major races. Australia is a red, sub-Saharan Africa a yellow-green, northwest Europe a green, and China, Japan, Korea a purple, and the New World various shades of purple. Each of the regions corresponds to what are traditionally considered races.

Of course, the map does show intergradations between the major populations. The concept of race as a sub-species implies that such gradations will be found, since if the populations could not interbreed they would be classified as different species, not merely different races. Other maps in the book confirm the existence of races. The map of the first principal component in Africa shows a sharp north to south gradient (p. 191). The contour lines are closer together in the Sahara. A quick glance shows that Africa can be divided into a North African area where live peoples traditionally called Caucasoids, and sub-Saharan Africa where live peoples traditionally called Negroids (the 2 southernmost zones pick up most of sub-Saharan Africa). The map shows a zone in the Sahara where the gene frequencies are intermediate. While such a zone probably does exist on the ground, the actual genetic data for it is weak. Only a few Saharan groups that have been studied (the Tuareg are the most important). The maps are marked with the data points used. Very frequently the data points are for the coast of North Africa, and for points south of the Sahara. In roughly the same way as weather maps are drawn, the computer then fills in the missing lines with zones of smooth transition.

Another very interesting first principal component map is for Asia (p. 250). For this continent the first principal component explains 35.1% of the total variance. The lines run very roughly north south with the extreme values in the Middle East, and in the Far East including Japan, China, and Vietnam. A line running between Burma and India corresponds closely with the traditional Mongoloid/Caucasoid division. It bends to include Tibet in the Mongoloid area, and then proceeds north. As the authors note, the highest values for the Caucasoid pole are not adjacent to Europe, but in the Arabian Peninsula, suggesting a possible gene flow out of that area.

In the far north of Eurasia (where the data is scarce), the Mongoloid line appears to reach almost to the Urals, although there is evidence of considerable mixing in the grasslands of northern Eurasia as populations have moved back and fourth. A widely debated question has been the nature of the Lapps, an Arctic European group speaking a language similar to that spoken in the Urals. The trees show that the Lapps group with other Europeans. Their gene frequencies could be approximated by a mixture of 52.5% Caucasians with the remainder Mongoloid, although another method shows more European mixture (p. 273). The best guess is that this group migrated into Scandinavia from nearer the Urals, bringing a Mongoloid pattern of gene frequencies with them, and then gradually interbred with other Scandinavians, until their gene frequencies had the general European pattern. The Finns, another group that speaks a Uralic language are estimated to be 90% European genes with 10% Uralic, while the Hungarians (also

speaking an Uralic language) appear to have a 10% non-European mixture (p. 273).

There are various other small groups around that are difficult to classify into the major racial groups. The Ainu, a traditionally hunter-gathering people of northern Japan, noted for their Caucasoid appearance and hairy bodies prove to have gene frequencies quite close to that of other Japanese, and hence should probably be placed within the Mongoloid major grouping.

Diseases and Gene Frequencies

The worldwide discussion finishes with a section that goes gene by gene, with commentary on the distributions. The details will be mainly of value to those interested in a particular gene. This may be a good point to discuss whether the genes studied are truly as neutral of the theory underlying the book assumes.

The measured distances between populations may be reduced if the genes in question have been subjected to frequency dependent selection. Frequency dependent selection occurs when the less common gene has an advantage. A very important example of frequency dependent selection occurs with parasites and infectious diseases. The body's defenses against foreign organisms depend on identifying them as foreign, which is done by the nature of the proteins on the surface of cells. Genetically, this is controlled by the human leukocyte antigen system, or HLA system. There are several loci, two of which, the A and B are very well studied in different populations. Each of these loci have numerous alleles. The frequency of each loci is treated as a different "gene" in this book. Thus a large part of the data base deals with these loci. "The most important system of markers in our collection, HLA, is represented by 12 A alleles and 17 B alleles." (p. 130) While the population genetics of the HLA system are not very well understood, there is probably a degree of stabilizing selection. Otherwise, the observed variability would not have survived (Takahata, 1993). Parasites and disease organisms evolve to have proteins that mimic those in the body. The immune system of an individual who has HLA genes that are relatively rare will find it easier to recognize foreign organisms. If any one HLA allele becomes relatively common, the diseases that attack the carriers of that allele become more common (Jones, 1992, Table on p. 287). The death rate among carriers of that allele increases, reducing the frequency of the allele. Other alleles have an advantage because their body can better recognize the most common pathogens. This mechanism is believed to be what has encouraged the high degree of genetic diversity that characterizes the HLA system. Many alleles are found in both humans, and in species as different as the mouse. (For a readable introduction to the role of parasites in evolution see Ridley, 1994. For a more technical discussion of the human HLA system see Klein, 1990).

There is a brief discussion of known associations with disease, but it is very likely that there are other associations that are not known, including some with diseases which were once important but which are no longer important.

Another very important gene system is the ABO which is vital in typing blood for transfusions. Because of the need for blood typing, it is very well studied, and available for virtually all populations. Certain blood types are known to be more vulnerable to certain diseases, probably because the body can more readily recognize certain invading organisms. For instance O individuals seem relatively resistant to syphilis (p. 126). This may explain why virtually all American Indians (except for Eskimos and some northern Amerind groups) are type O, since syphilis is believed to have been introduced into the Old World by Columbus. Individuals with type A are more vulnerable to smallpox. Tuberculosis (pulmonary) is believed to be more virulent in A individuals than in O or B. Malaria shows a preference for A individuals. Thus, it appears that balancing selection may exist for the ABO blood group.

The frequencies of other genes are believed to be affected by diseases. The Duffy O allele (very high frequency in Africans) confers resistance to a particular malarial parasite, *Plasmodium vivax*. A number of the G6PD variants produce resistance to malaria. The immunoglobulin genes GM and KM, which produce antibodies and play an important role in defense against pathogens, could very well be subject to stabilizing selection. The secretory system FUT2(SE) which brings into "secretions substance responsible for A, B, and the related H substances that are normally found on the red cells of individuals and define their ABO status" (p. 133) is known to affect vulnerability to ulcers, with secretors less vulnerable.

As the brief discussion above shows, many of the widely studied genetic systems that are the subject of this book appear likely to be subject to stabilizing selection (the frequency dependent selection referred to above), such that rare alleles have a reproductive advantage. This would tend to reduce genetic differences between the world's peoples. The effect is probably not enough to make the assumption of neutrality, which underlies much of this book's theory, inapplicable. However, the reader should keep in mind that some gene systems may be subject to stabilizing selection, and others to disruptive selection, and some perhaps to both. A system can be subject to both if allele frequencies tend to a particular equilibrium value under certain conditions, but this equilibrium frequency depends on location. Climatic or cultural differences could make the equilibrium gene frequencies depend on location. Important examples are for malaria where in malarial areas there is a high equilibrium frequency for alleles giving resistance to malaria, and a zero equilibrium frequency in malarial regions. A useful discussion of the distribution of the genes believed to protect against malaria is provided (p. 146-149), although these genes are not used in calculating genetic distances, since their genes reflect selection more than drift.

Incidentally, awareness that many of the easily studied genes appear subject to stabilizing selection is important in evaluating a commonly made argument. It is frequently asserted that only 6.3% of the genetic variation is between races, with the rest being between populations (8.3%) or between individuals within populations 85.4% (Lewontin, 1972). While it is probably true that most of the genetic variability is between individuals, the popular statements do misrepresent the scientific research. A correct statement might be 6.3% of the measurable gene

frequencies variation is between races. Lewontin's work (cited on p. 19) dealt with the genes that could be measured at the time he wrote (many fewer than can now be measured). None of these genes affected skin color, nose shape, body build, size, etc. to mention characteristics that differ between races. We can be fairly sure that the genes that were studied (or could be studied given the knowledge then available) were not a random sample of all genes. It appears they overemphasized the genes that were relevant to the body's defenses against disease, and which were subject to stabilizing selection. If this is so, the importance of racial differences is understated.

The Regional Chapters

The remainder of the book is organized in the same way as the Worldwide chapter, except that each chapter focuses on a continental area, and more populations are discussed within each chapter than the few from each continent that were included in the study of 42 populations. Each chapter starts off with a good review of the prehistory of the region, and a history of population movements up to 1500 AD. These are useful to non-specialists, but probably contain little that is not known to the regional specialists.

A distance matrix is then calculated for the selected populations, and used to produce a tree showing the estimated lines of descent. This is then discussed, with emphasis on various interesting issues, such as the origin of particular populations. Principal components are then calculated and discussed. Individual genes are then discussed.

For the chapters on Asia and on Europe, there is a third level. Asia is discussed region by region, (Arctic, Northeast Asia, Southeast Asia, the Indian subcontinent, Central Asia, and West Asia). In Europe, selected regions are given a similar detailed treatment (Italy, France, the Iberian Peninsula, Sardinia), with maps of principal components being presented.

Asia

The major surprise to this reader was in the Asian chapter. There is a tendency to think of the third of the human race that is Han Chinese as a homogeneous population. The analysis shows large differences between North China and South China. In a tree with 39 Asian populations (p. 225), the first split puts South Chinese with other Southeast Asian populations, such as the Philippine, Malaysian, Thai, and Indonesian, with the Thai and Viet Muong being the closest. In contrast North China groups with Korea, Japan, and Tibet, as might be expected. However, this group is actually shown as being closer to such groups as the Turkish, Lebanese, and Iranians, traditionally considered as Caucasoid.

A possible explanation is that agriculture emerged twice in China, once in north China for millet, and once in south China for rice, and that these populations then expanded, freezing their gene frequencies. The dividing line is placed between the Yangtze and the Yellow River.

Supporting evidence is provided by an analysis of a stratified sample of about 540,000 Chinese surnames from the 1982 Census, which shows a pattern which is argued to be roughly similar to the three Neolithic Cultural areas.

The importance of this finding of a relatively large difference between the North and South Chinese is that much research is done on American or Canadian born Chinese (Vernon, 1982), which are predominantly of South Chinese descent, coming from Hong Kong, Canton, or their vicinity. It may be risky to generalize from this to the whole of Han China.

For those interested in behavior and economic development, the resemblance between South Chinese and the Filipinos, Malays, etc. presents a problem. The South Chinese generally do well on intelligence and academic tests whether tested in the US or in Hong Kong, often better than Caucasoids. Filipinos generally don't do as well. Within Malaysia, the Chinese test much better than the Malays. Within Southeast Asia, the overseas Chinese generally do much better economically than the Malays (Sowell 1994). Thus, it is surprising to see the small genetic differences between the South Chinese and adjacent populations.

Europe

Someone interested in the genetic relationships of various populations will find much of interest in the various chapters on the Continents.

For instance, in inspecting the tree for Europe (p. 268), the Lapps will be found to be the population that is furthest separated from other populations. Next come the Sardinians, which are sufficiently different from other Europeans that their inclusion in the principal components analysis would have required that they be given a component to themselves (p. 291). Their unique gene mix is attributed primarily to genetic drift in a small population. The Basques are found to be another distinct group, who are argued to be a remnant of the original Europeans. Iceland is found to be quite distinct from the rest of Europe, which is attributed to genetic drift in a small population. None of these small populations made major contributions to the peopling of America.

A very large cluster puts such Central European peoples as the English, German, Swedish, Italian, Polish, and Russians together (p. 268). Interestingly, the Irish and Scottish are just outside this cluster, even though many think of them as very similar to the English, perhaps because they have been politically united with them. Even though there are historic rivalries between such peoples as the French and the Germans, or the Russians and Poles, the data here shows that any genetic differences are too small to account for much of the differences in national character that some observers claim to see. Needless to say, the similarity in gene frequency among these groups of peoples, which include among themselves such major Europe races, the Nordic, the Alpine, the Mediterranean, and Slavs is strong evidence against any claim for the genetic superiority of the Nordics, or of the Germans, such as the Nazi's reportedly

claimed. It is very unlikely that the behaviorally relevant genes could differ much in frequency given the small differences in frequency for the measurable genes. The similarity in gene frequency has been brought about either by these populations being recently derived from a common population or populations (probably a Neolithic farming group spreading from the Middle East followed by later immigrants from the steppes of Asia), or by a high level of intermixture among these various populations. Either of these possibilities would be inconsistent with large differences in the frequency of socially important genes, although it does not make such differences completely impossible.

Africa

A somewhat similar situation is found for Africa. Anthropologists traditionally spend much time on small populations that are interesting, but which account for relatively few people. Thus, the African chapter has sections on the Pygmies, the Khoisan, and the peoples of Ethiopia and the Sahara. However, the bulk of the population of sub-Saharan Africa is composed of either Bantu speakers, or West Africans. The populations within both of these large groups are found to differ little genetically from each other. In the case of the Bantu speakers this is believed to be because they spread from a much smaller population originating from near Cameroon. The linguistic, archaeological, and historical evidence for this movement is expounded on. The historical evidence is mainly relevant to South Africa where history shows that the Bantu moved into the area, displacing the Khoisans at about the same time as the Europeans came in. Similarity in languages and archaeological evidence traces the earlier stages of the movement. The genetic similarities between different groups is consistent with the hypothesized movements, and suggests that there were two streams, one moving south first, and the other east into East Africa, and then South (p. 183-185). Because of this relatively recent Bantu expansion, the various Bantu populations do not differ much from each other genetically.

In West Africa, the various population differ from each other a little more, but still resemble each other. The authors hypothesize that this similarity may be caused by an expansion out of a single population that first adopted agriculture. An alternative explanation provides for three such original populations, with only the easternmost (the Bantu speakers) being in a position to expand into southern Africa (p. 185). In any case, the Bantu and the West Africans groups do not differ much genetically.

It was pointed out earlier that the major European populations do not differ much from each other either. Most of the United States is composed of descendants of either the major European populations, or the descendants of slaves from either West Africa or Bantu territory. The two groups are quite distinct in gene frequencies and appearance. On the world principal component diagrams, they are at opposite poles for the second principal component (p. 82). Thus, it is not surprising that in America the difference between descendants of Africans and Europeans has been noticed, and led to people being classified into two races, which have been documented to differ in many traits besides appearance (Herrnstein & Murray, 1994; Miller, 1994a,b,c;

Rushton, 1994)

As the book shows, there are numerous populations that are intermediate to these populations in gene frequencies, such as North Africans, East Africans, Nilo-Saharan Ethiopians, inhabitants of the Sahara, and North Africans. There are other groups that have a somewhat different pattern of gene frequencies (Pygmies, Khoisans, Sardinians, Icelanders), but none of these groups contributed much to the United States populations. It can be argued that there are clines in the Old World, with gene frequencies changing gradually from North to South (although relatively rapidly across the Sahara). This doesn't alter the fact that the vast majority of the ancestors of the (non-Mongoloid) United States population can be classified as either Negroid (Bantu or West African), or Caucasoid (European). Of course, subsequent mixing has occurred, and there are many Americans whose ancestry is now mixed.

Outside of the major populations of Africa there are several minor populations that are of interest. The book is filled with fascinating findings about these populations. The Tuareg, who have always been a very mobile people (p. 173) extend over an area stretching from the northern boundary of the dry Sahara (Algeria and Libya) into the Sahel (p. 171). The authors (p. 173) show that there is a surprising degree of genetic similarity between the Tuareg and the Beja (whose genetic distance from the Tuareg is only 135), a people in the Eastern Sahara whose territory adjoins the Red Sea.

Since every reviewer must find at least one error, it might be noted that the location of the Beja is different on the map on p. 170 than on the one on p. 171 (which is probably the correct one).

The genetic similarity is surprising given a relatively large geographic distance. They hypothesize a common origin, perhaps 5000 years ago. This is a long time, but the minimum east-west migration across the Sahara required for the groups to have a common origin is much greater than the width of the Sahara. A few such migrations over tens of thousands of years could greatly reduce or eliminate any genetic differences between North Africa and sub-Saharan Africa. Yet, as the authors document very well, the genetic difference between the Caucasoid inhabitants of North Africa and the Negroid inhabitants directly south in West Africa is quite large (not to mention the obvious differences in skin color and other aspects of appearance). This makes it very likely that the current North African populations did not evolve in place, since if they had they would not be as different from other Africans as they are.

Thus, the large genetic differences north and south of the Sahara present a problem that is not easily solved merely by noting that there is a low density, dry area in between, since large population movements (carrying with them genes) have apparently occurred.

I have developed a theory (Miller, 1994d) that the large genetic difference between the Eurasian populations and the African ones that Cavalli-Sforza et al. document so well is partially due to an early modern movement out of Africa into Eurasia followed by the movement of the

Neandertals into the Middle East. This divided the modern population into two segments. Later, a branch, or branches of the European Caucasoid population moved into north Africa.

There is one large area of Africa whose racial affinity has been unclear. This is Ethiopia and adjacent areas. The people tend to have somewhat Caucasoid facial features but dark skins. The gene frequency data suggests that the Amhara (The dominant Ethiopian group) have gene frequencies could be achieved by a mixture of 57% Nilotic African genes with 43% of genes from North Africans (p. 174). Other European populations are similar. Thus, if one must classify these people into one major race, they should be called Negroid. The recorded history of the region and its location makes it very likely that there was an actual admixture of Caucasoid and Negroid peoples here.

Another group that has been the subject of much discussion is the Khoisanid peoples (including the Hottentots, San, !Kung). The San (Bushmen) in southern Africa are a group that physically looks quite different from other Negroids. Baker (1974), and Coon (1965) among others, have argued they are as different from Negroids as Caucasoids are, and should be treated as a separate race from other Negroids. The genetic data reported here shows them to differ more from other sub-Saharan Africans than any of the sub-Saharan groups differ from each other (p. 175).

Interestingly, the San are closer to Near Eastern populations than the adjacent Bantu populations. Their gene frequencies are consistent with their being 56% Near Eastern, with the remainder African. Given that the territory they currently occupy is distant from Caucasoid territory, this is puzzling. However, a possible theory supported by historic remains and linguistic traces, is that they were once were in East Africa, possibly as far north as Egypt. Some mixing with Caucasoids could have occurred then.

The Ethiopian populations, which appear to be a similar Caucasoid, Negroid mix show a considerable genetic distance from the San, suggesting if both are a result of mixture, the mixtures occurred at different times.

An alternative hypothesis, that is supported by mitochondrial DNA evidence and the San's distinctive morphology, is that they are a relict population of an early race of humans whose territory once covered much of Africa, and are the ancestors of all humans (p. 176). It is interesting to see how modern genetic data supports the earlier idea of Coon that these were a relict of the original populations from which other groups split (1963, 1965). Here the resemblance with the Near Eastern populations is explained by these populations having been derived from the San.

Unfortunately, there is little gene frequency data for Madagascar, and this island is frequently left off of the maps due to lack of information. Madagascar is potentially very interesting because the language of the Malagasy is similar to languages from south-central Borneo. It is generally believed that Madagascar was settled from there by people of Austronesian origin,

rather than from nearby Africa (p. 168), whose inhabitants had apparently not yet developed suitable boats.

The Americas

"The genetic evidence for the Americas fully confirm the three waves of migration suggested by dental and linguistic evidence: Amerinds, Na-Dene, and Eskimo" (p. 349). Of course, much interesting detail is supplied. For instance, the high degree of genetic diversity among South American tribes is attributed to drift in numerous small populations.

Australia, New Guinea, and the Pacific Islands are discussed in the final chapter. The genetic evidence is not particularly definitive for Australia and New Guinea.

The book closes with a call for further research, and for collecting data on various small populations of the world before they disappear. Such an effort is underway as part of the Human Genome project.

Conclusions

For the student of race this book makes several points. One is that there is considerable genetic variability between populations. Human populations differ in much more than skin color. This makes it more plausible that they differ in socially and economically important ways including intelligence, personality, disease resistance, sexual behavior etc.

While one can argue about the placement of various small groups, there do appear to be three major groups that include very large number of people, and whose gene frequencies differ. These are the traditional three groups of Negroids, Caucasoids, and Mongoloids. American Indians and Australians constitute other large groupings with distinctive gene frequencies.

Overall, this is a very valuable book that should be in every university library, although its high cost will keep it out of most private libraries.

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Evolution, Altruism and Genetic Similarity Theory

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The author reviews his work on altruism, offering a time continuum for understanding levels of explanation in social behavior showing that individual differences in both prosocial and antisocial behavior are about 50% heritable, and outlining how epigenetic rules guide development in one direction over alternatives. He also presents "genetic similarity theory," showing that humans are able to detect degrees of genetic similarity in others and to prefer those most similar for friendship and marriage, a process which provides a basis for ethnic favoritism and group selection.

Numerous confusions have occurred in the behavioral sciences as a result of not separating distal from proximal levels of explanation (see Figure 1). When reasoning moves from distal to proximal, controversy does not ensue. Evolutionary biologists do not find the heritability of traits problematic; trait theorists accept that dispositions are modified by later learning, and learning theorists believe that the products of early experiences interact with subsequent situations to produce emotional arousal and cognition. Resistance is more likely, however, as explanations move from proximal to distal. Thus some phenomenologists mistrust the reduction that consciousness is partly the result of previous learning. Situationists and learning theorists do not always accept that people's choices and development may be guided by inherited traits. Often behavioral geneticists ignore evolutionary history.

Behavior can be analyzed usefully from each of the levels. It is well established that situations are important sources of behavioral variability, as when mood changes of happiness and anger alter people's altruism and aggression (Rushton, 1980). People can also be shown to differ, however, in average mood state. It is at this stage of the analysis that conceptual problems have occurred for some have found it difficult to see that if people alter their behavior with varying circumstances, they can be said to have enduring characteristics that reliably differentiate them from others. Indeed, there has been considerable debate in psychology about the degree to which "traits" reliably differentiate people. Social learning theorists, for example, have emphasized people's ability to modify their behavior across different situations. It is now known, however, that when people's behavioral responses are aggregated across numerous situations substantial average differences are found between people (Rushton, Brainerd & Pressley, 1983).

Social groups (age, sex, socioeconomic, race) often differ in average traits scores, although it has become fashionable to deemphasize these. As with traits generally, group differences are best observed when several particulars are aggregated. This was recently shown in an analysis

of questionnaire data gathered from 573 pairs of twins. Females have been found to be significantly more altruistic and empathic (and less aggressive) than males, and altruism had been found to increase with age from 20 to 60, while aggression decreased. These observations would have been missed if the analyses had relied on single items, for the variance accounted for by sex differences increased from 1 to 3 to 8 percent as the number of questionnaire items increased from 1 to 5 to 23 (Rushton & Erdle, 1987). Parallel results were found to occur when age and socioeconomic status differences were examined. Combining age, sex and socioeconomic status in a multiple regression equation, again differentiating a 1 to 23 item scale, led the multiple R to increase from an average of 0.18 for single items to 0.39 for the 23 items. The origin of behavioral differences are consistently found to be about 50% heritable, even for traits such as altruism and aggression which parents are expected to socialize heavily. Too many assessment procedures and research designs have been involved for these findings not to be accepted (Holden, 1987). For example, according to American, Danish and Swedish adoption studies, children who were adopted in infancy were at greater risk for victimizing others if their biological parents had been convicted of a crime than if their adoptive parents had been (Cadoret, Cunningham, Loftus & Edwards, 1975; Cloninger, Sigvardsson, Bohman & von Knorring, 1982; Mednick, Gabrielli & Hutchings, 1984). In Mednick, Gabrielli and Hutchings' (1984) study of 14,427 children separated from parents at birth, it was found that siblings and half-siblings adopted separately into different homes were concordant for convictions. Converging with this adoption work, twin studies of adults have found that identical twins were roughly twice as

TABLE I Estimates of Variance Components and Estimates Corrected for Unreliability from a Biometrics Analysis of Aggressiveness, Assertiveness, Altruism, Empathy and Nurturance Questionnaires from 573 Adult Twin Pairs. (After Rushton, Fulker, Neale, Nias and Eysenck, 1986.)

	Additive	Specific Trait	Genetic	Common Environ-	Environ-	Variance mental	Variance mental
Aggressiveness	39%	(54%)*	0%	(0%)*	61%	(46%)*	Assertiveness 53% (69%)*
Altruism	51%	(60%)*	2%	(2%)*	47%	(38%)*	Empathy 51% (65%)*
Nurturance	43%	(60%)*	1%	(1%)*	56%	(39%)*	

*Estimate Corrected for unreliability of questionnaire.

much alike in their aggressive and criminal behavior as fraternal twins (Christiansen, 1970; Cloninger, Christiansen, Reich & Gottesman, 1978; Rowe & Osgoode, 1984). As shown in Table 1, in Rushton et al.'s (1986) analysis of twins reared together, the heritability of both altruism and aggression was about 50%.

One of the less appreciated aspects of twin studies is the information they also provide about environmental effects. The important environmental variance turns out to be within a family, not between families (see Table 1). That is, the common family environment plays a very limited role in social development. Such factors as social class, family religion, parental values and child rearing -styles, for example, are not found to have a common effect on siblings. This

runs counter to prevailing "sociological" theories of social development that assume that the important environmental variance is between families, not within. Yet the observation that the environmental factors that influence development are those that are specific to each sibling, rather than common, is robust, having been replicated using samples of four different types: twins reared together, twins reared apart, adoptive parents and their offspring, and adoptive siblings (Plomin & Daniels, 1987). Regardless of whether one considers the transmission of socially undesirable traits such as crime, obesity, and schizophrenia, or more normative personality characteristics such as vocational interests and value systems, the evidence reveals that whereas genetic influences have an important role to play, the common family environment alone has little apparent effect.

These results are most readily grasped from the comparison of twins reared together and apart. They are also derived from the comparison of adoptive and biological siblings raised in the same family from infancy to adulthood, where the less related the siblings are, the increasingly divergent they grow with age. Table 2 presents a contrast of the world literature on adult identical twins reared apart in intelligence and personality, with that of other relationship categories (Bouchard, 1984; Rushton, in press). The results show substantial genetic effects on the traits in question and considerably weaker effects due to common environment. That siblings raised apart for many years in complex environments grow to be significantly similar to each other on a variety of traits, and that their degree of similarity is predicted by the number of genes they share, implies the presence of genetically based stabilizing systems that channel

TABLE II

World Literature on Similarity in Adult Twins Raised Apart Compared with Other Relationship Categories on Intelligence and Personality (After Bouchard, 1984 and Rushton, in press).

INTELLIGENCE	PERSONALITY	Number of Intraclass Pairs	Number of Intraclass Pairs
Correlation	Correlation	Identical Twins Reared Together	Identical Twins Reared Apart
65	.72	4,672 .86	5,000 .52
106	.54	Fraternal Twins Reared Together	Fraternal Twins Reared Apart
29	.47	20 .18	26,473 .47
203	.24	- -	17 .20
		Together Adoptive Siblings Reared	369 .34
		Together Biological Siblings Reared	78 .07

development (Lumsden & Wilson, 1981; Rushton, Littlefield & Lumsden, 1986).

Epigenetic Rules in Social Development

Genes do not cause behavior directly. They code for enzymes which, under the influence of the environment, lay down tracts in the brains and nervous systems of individuals, thus differentially affecting people's minds and the choices they make about behavioral alternatives. In regard to altruism and aggression, for example, some people may inherit temperaments that dispose them to empathy or impulsivity, or a lack of conditionability. There are many plausible

routes from genes to behavior and collectively these routes may be referred to as epigenetic rules.

Epigenetic rules, originating in the process of evolution, provide recipes by which individual development is guided in one direction over alternatives. Their operation is most apparent in embryology in which the construction of anatomical features occurs. To take a familiar example, the physical development from fertilized egg to neonate follows a preordained course starting in the head region and working its way down the body. By the end of the first month, a brain and spinal cord become evident, and a heart has formed and begun to beat. By the end of the eighth week, the developing fetus has a face, arms, legs, basic trunk and internal organs. By the sixth or seventh month, all major systems have been elaborated, and the fetus may survive if born prematurely.

The canalization of growth processes is also illustrated by findings from developmental behavioral genetics (Bouchard, 1984; Plomin & Daniels, 1987). Phenomena reflecting genetic timing mechanisms, for example, include the age of onset of puberty, first sexual experience, and menopause, in which identical twins are highly concordant. Another example is Huntington's chorea, a degenerative disorder of the central nervous system caused by a dominant gene. Age of onset varies from 5 to over 75, but family studies show that it is under genetic control. Chronogenetics also affects cognitive development as shown in a large sample of twins followed from 3 months to 15 years of age in which the synchronies between lags and spurts in mental development were found to average about 0.90 for identical twins, but only about 0.50 for fraternal twins.

Psychological development is also guided by epigenetic rules from sensory filtering through perception to feature evaluation to decision making (Lumsden & Wilson, 1981). For example, while the brain perceives variation in luminance along a continuum, it divides color into categories, using language to do so. Many social scientists used to believe that the divisions into red, green, and so forth are arbitrary, but linguistic and cross-cultural studies have shown that they are in fact closely tied to natural color perception. The application of epigenetic rules to more complex social behavior has also been made. For example, canalized end points appear to underlie the evolutionary function of smiling, attachment and separation responses in infants (Freedman, 1974). Similar interpretations can be made of the life-cycle stages documented to occur in ego-development, mortality, and psycho-social functioning (Loevinger, 1987). Epigenetically based physiological hypotheses can also be provided. Thus androgens may underlie Rushton, Fulker, et al.'s (1986) observations that altruism increases across the life-span while aggressiveness decreases, and that sex differences hold up consistently across time. Testosterone production is known to increase with age and to differentiate the sexes in the predicted direction.

The idea of genetic canalization provides an explanation for the important finding, shown in Tables 1 and 2, that common family environment has little impact on longer term personality

development. Thus, within the same upbringing environment, the more belligerent sibling may observationally learn the items from the parents' aggressive repertoire, whereas his more nurturant sibling selects from the parents' altruism responses. For example, in an analysis of television effects, Rowe & Herstand (1986) found that although same-sex siblings resembled one another in their exposure to violent programs, it was the most aggressive sibling who a) identified most with aggressive characters, and b) viewed the consequences of the aggression as positive. Within-family studies of delinquents find that both IQ and temperament distinguishes delinquent siblings from those who are non-delinquent. It is not difficult to imagine how intellectually and temperamentally different siblings might acquire alternate patterns of social responsibility.

The potential of epigenetic rules to bias behavior and affect society may go well beyond ontogeny. Via cognitive phenotypes and group action, altruistic inclinations may be amplified into charities and hospitals, creative and educative dispositions into academics of learning, martial tempers into institutes of war, and delinquent tendencies into social disorder. The idea that genes have such extended effects beyond the body in which they reside, biasing individuals to the production of particular cultural systems, constitutes a central focus for current thinking in sociobiology (Dawkins, 1982; Lumsden & Wilson, 1981). Within the constraints allowed by the total spectrum of cultural alternatives, people create environments maximally compatible with their genotypes (Rushton, Littlefield, & Lumsden, 1986).

Genetic Similarity Theory

That genotypes seek out maximally conducive environments is particularly well illustrated by findings that people select similar others with whom to associate, both as friends and as marriage partners. Both friends and spouses assort on the basis of such characteristics as race, socioeconomic status, physical attractiveness, religion, social attitudes, level of education, family size and structure, IQ, and longevity (Rushton, Russell & Wells, 1985; Thiessen & Gregg, 1980). Correlations tend to be higher for opinions, attitudes, and values (0.40 to 0.70) and lower for personality traits and personal habits (0.02 to 0.30). Advantages thought to accrue to optimizing similarity in personal relations include increased altruism, cooperation and trust.

That such assortment is genetically mediated is suggested by studies of animals where assortative mating occurs in species ranging from insects through birds to primates (Thiessen & Gregg, 1980), and where animals raised apart show a preference to interact with kin rather than non-kin (Holmes & Sherman, 1983). My colleagues and I have investigated the phenomena in humans. Using blood antigen analyses to estimate genetic distance across 10 blood loci using 7 polymorphic marker systems (ABO, Rhesus (Rh), P, MNSS, Duffy (Fy), Kidd Jk), and HLA over 6 chromosomes, we found that both male friendship dyads and sexually interacting couples share more genetic markers than do randomly generated pairs from the same samples (Rushton, 1987; Rushton & Chan, 1987). We also found that the epigenetic rules inclining people to choose each on the basis of similarity appear to be fine tuned, biasing individuals to assort on

the more genetically influenced of homogeneous attributes. Positive correlations between assortment and genetic influence have been observed on a variety of anthropometric, cognitive, personality and attitudinal characteristics in both friendships and marriages (Rushton & Nicholson, in press; Rushton & Russell, 1985; Russell, Wells & Rushton, 1985). Following the death of a child, for example, both mothers and fathers irrespective of sex of child are found to grieve more for children resembling their side of the family than they do for children resembling their spouse's side (Littlefield & Rushton, 1986). It would appear that people are able to detect genetic similarity in others and act accordingly.

The implications of these findings may be far-reaching. For example, they provide a biological basis for ethnic nepotism. Since two individuals from within an ethnic group will, on average, be genetically more similar to each other than two from different ethnic groups, an individual is expected to benefit his own group over others. Ethnic conflict and rivalry is of course, one of the great themes of historical and contemporary society (van den Berghe, 1981). Ethnic altruism is demonstrated by group members preferring to congregate in the same area and associate with each other in clubs and organizations. Charitable donations are typically made in greater quantities within ethnic groups than between them and social psychological studies have documented that people are more likely to help members of their own race or country than members of other races or foreigners.

The reason people give preferential treatment to genetically similar others is both simple and profound: they thereby replicate their genes more effectively. Altruism is a very interesting phenomenon, even recognized by Darwin as an anomaly for his theory. How could it evolve through his hypothesized "survival of the fittest" individual when such behavior would appear to diminish personal fitness? If the most altruistic members of a group sacrificed themselves for others, they ran the risk of leaving fewer offspring to carry forward their genes for altruistic behavior? Hence altruism would be selected out, and indeed, selfishness would be selected in. Altruistic behaviors, however, occur in many animal species, some to the point of self-sacrifice (Wilson, 1975). For example, honey bees die when they sting in the process of protecting their nests.

Darwin proposed the competition of "tribe with tribe" to explain altruism (1871, p. 179). Thus a tribe of people willing to cooperate and, if necessary, sacrifice themselves for the common good would be victorious over tribes made up of those less willing or able. Indeed, he actually titled his epoch-making 1859 publication: "On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life." Subsequently Herbert Spencer (1892/93) extended this, suggesting that the operation of a 'code of amity' towards the members of their own group, and a 'code of enmity' toward those of out-groups prevailed in successful groups. In non-elaborated forms, some version of "group-selection" was held by most evolutionists for several decades.

It wasn't until Wynne-Edwards (1962) however that the altruism issue finally began to dominate

theoretical center-stage. Wynn-Edwards suggested that whole groups of animals collectively refrained from over-breeding when the density of the population became too great - even to the point of directly killing their own offspring if necessary. Such self-restraint, he argued, protected the animals' resource base and gave them an advantage over groups of individuals which did not practice restraint and which became extinct as a result of their profligacy. This extreme form of the group selection argument was immediately disputed by other biologists. A great deal of subsequent argument and data was marshalled against the idea (Williams, 1966).

A degree of polarization followed. As D. S. Wilson put it, "For the next decade, group selection rivaled Lamarkianism as the most thoroughly regudiated idea in evolutionary theory" (1983: 159). Mathematical models were presented apparently showing that group selection could override individual selection only under extreme conditions. Essentially, there did not seem to exist a mechanism by which altruistic individuals would leave more genes than individuals who cheated. The solution to this paradox is one of the triumphs that led to the new synthesis of sociobiology. Following Hamilton (1964) the answer proposed was that individuals behave so as to maximize their "inclusive fitness" rather than only their individual fitness by increasing the production of successful offspring by both themselves and their relatives, a process that has become known as kin selection. This formulation provided a conceptual breakthrough, redirecting the unit of analysis from the individual organism to his or her genes, for it is these which survive and are passed on. Some of the same genes will be found in siblings, nephews and nieces, grandchildren, cousins, etc., as well as offspring. If an animal sacrifices its life for its siblings' offspring, it ensures the survival of shared genes for, by common descent, it shares 50% of its genes with each sibling and 25% with each siblings' offspring.

It is predicted, then, that the percentage of genes shared is an important determiner of the amount of altruism displayed, and this is borne out in a number of species. Social ants, for example, are one of the most altruistic species so far discovered and, because of a special feature of their reproductive system, also share 75% of their genes with their sisters. Thus by working for others, and sacrificing their lives if need be, they help to propagate their own genes. Extreme forms of altruism also may occur in clones (e.g., aphids), where individuals are 100% related.

Hamilton's (1964) theory of inclusive fitness was generally regarded as an extension of individual selection, not group selection (Dawkins, 1976). A compromise position was offered by E. O. Wilson (1975) who suggested that while the genes are the units of replication, their selection could take place through competition at both the individual and group levels which were viewed as opposite ends of a continuum of ever enlarging nested sets of socially interacting individuals. In this account, kin-selection is seen as intermediate between individuals and group selection. Under the rubric of "genetic similarity theory," Rushton Russell & Wells (1984) proposed an extension to the theory of kin-selection to the human case where altruism is provided to non-kin as well as to kin. Adopting the mechanistic perspective of the selfish gene, we argued that genes could maximize their replication by benefiting any

organism in which copies of themselves were to be found. Thus kin-selection is but one form of genetic similarity selection. In order to pursue the strategy of benefiting similar genes, people must be able to discriminate degrees of genetic similarity in others. The results from our studies on marriage and friendship indicated they could do so.

Benefiting genetically similar others has been greatly enhanced through culture. Through the use of language, law, religious imagery, and patriotic nationalism replete with kin terminology, ideological commitment enormously extends altruistic behavior. Indeed recent analyses suggest that evolution under culturally driven group selection, including migration, war and genocide may account for the greatest amount of change in human gene frequencies (Ammerman & Cavalli-Sforza, 1984; Melotti, 1984; Vining, 1981; D. S. Wilson, 1983). The human propensity for deontological action may be guided by epigenetic rules which lead people to those cultural choices which maximally increase their genetic fitness (Lumsden & Wilson, 1981; Rushton, 1986; Rushton, Littlefield & Lumsden, 1986). In this analysis, the makeup of a gene pool causally affects the probability of any particular ideology being adopted, which subsequently affects relative gene frequencies. Religious, political, and other ideological battles may become as heated as they do because they have implications for genetic fitness; genotypes will thrive more in some cultures than others. From this perspective, Karl Marx did not take the argument far enough in the distal direction: ideology serves more than economic interest; it also serves genetic purpose.

For this account to be true, a) individual and group differences in ideological preferences must be partly heritable, and b) ideological practices must confer differential genetic fitness. Evidence exists to support both these propositions. With respect to a), while it has generally been assumed that political attitudes are for the most part environmentally determined, both twin and adoption studies demonstrate moderate to substantial heritabilities (e.g., 0.50) for both specific conservative social and political attitudes, as well as stylistic tendencies such as authoritarianism and degree of ideological commitment (Martin, Eaves, Heath, Jardine, Feingold, and Eysenck, 1986). With respect to b), whether the learning of ideologies can increase genetic fitness, obvious examples are to be found in those religious beliefs regulating sexual practices, marital custom, infant care, and child rearing (Reynolds and Tanner, 1983). Other evidence derives from cultural proscriptions on dietary habits. Amerindian tribes adopting the use of alkali cooking for maize, for example, had larger population densities and more complex social organizations than Amerindian tribes who did not, primarily because alkali cooking releases the most nutritious parts of cereal, enabling more tribal members to grow to reproductive maturity (Lumsden and Wilson, 1981). The native tribes were unable to explicate the biochemical reasons for the benefits of alkali cooking, but their cultural beliefs had evolved for good reasons.

The role of genetic similarity in politics is likely to become increasingly noticeable in both the US and the USSR as the turn of the century approaches. Both of the superpowers have large ethnic minorities and, given the differential in birth rates, between majority and minority

populations, the current ruling groups are unlikely to maintain their positions much longer. One reason the USSR invaded Afghanistan was to suppress Moslem fundamentalism which, if spread to the southern socialist republics, could bring an end to the existing power structure. The genetic minorities have the highest birth rates in the USSR and can ultimately be expected to displace the currently dominant Russians. In the US power shifts can be expected as the differential birth rates of Spanish-speaking Americans, black Americans, and the currently dominant North European Americans continues.

Genetic similarity can thus be expected to be one of the many influences operating on political alliances. Obviously causation is complex, and it is not intended to reduce relationships between ethnic groups to a single cause. Fellow ethnics will not always stick together, nor is conflict inevitable between groups anymore than it is between genetically distinct individuals. Behavioral outcomes are always mediated by multiple causes. The Western European world is currently aligned primarily against the Russians, their half-cousins, while the more genetically distant Japanese are allies. It is an empirical question though whether it would be easier to manipulate antipathy in white Americans toward the Japanese than toward the Russians, or whether class conflicts become more intense when there is a racial element to them. Thus while "politics make strange bedfellows" and human alliances are constantly shifting, behavior may become more predictable as genetic distance measures are added into the equation.

A note on a paradox is essential. If the replication of similar genes is as strong an evolutionary imperative as sociobiological theorizing suggests, why are descendants of European populations throughout the world currently experiencing negative growth while allowing extensive immigration from genetically less similar gene pools? Why also have ideologies been adopted which discourage nationalist and religious sentiments proportional to the degree to which they express concern about such issues? Clearly ideologies can arise which have the paradoxical effect of dramatically decreasing fitness. A classic example of such a lethal idea is to be found among the Shakers, a religious sect which considers sex to be so sinful that it imposes celibacy upon even its married members. This ideology has until recently been quite successful in replicating itself through several generations; new adherents being recruited, largely via adoptions. The member's genes, of course, fail to replicate.

The fertility paradox goes back centuries. Fisher (1958) raised the question of why civilizations decay, and documented evidence in favor of the hypothesis that the ruling group (often classes, sometimes races) failed to reproduce themselves, usually having much lower fertility than the ruled groups. Fisher (1958) hypothesized a trade-off between the capacity for economic success and fertility and there is increasing evidence that such a syndrome exists (Rushton, 1985; following Wilson, 1975). The fact that successful cultures arise whose members subsequently limit their own replication, giving less genetically similar others the opportunity to replace them, must be considered a major challenge for evolutionary biology (Vining, 1986). Its solution probably requires adding a stronger component of cultural transmission to the traditional concern with genetics. If successful, this explanatory breakthrough may herald a

quantum jump in understanding the nature of gene-culture coevolution.

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Geographical Centrality as an Explanation for Racial Differences in Intelligence

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Summary

Intelligence is affected by many different genes. It has also plausibly been subject to unidirectional selection. Calculations show that favorable mutations would move at a rate that was slow relative to the time since modern human symbolic culture emerged. This makes it very likely that geographical differences in the frequencies of various intelligence related genes exist. With unidirectional selection in a polygenetic system, it is meaningful to talk about some areas being more advanced than others (since there is a direction in which all are moving). Centrally located populations will normally be more advanced. Genes will move faster in thinly populated areas. The thinly populated areas can serve as genetic freeways that carry genes rapidly across continents.

New technologies, including agriculture, the horse and the ship, accelerated the spread of mutations. The horse caused the Eurasian steppes to become a genetic highway that transported favorable mutations across Eurasia. This probably caused these areas to reach high levels of intelligence ahead of other areas. Areas without horses or ships, such as sub-Saharan Africa lagged. Peripheral areas such as Australia and the Americas also lagged due to isolation from the large populations of Eurasia. Keywords: Intelligence, race, population genetics, unidirectional selection.

In his survey of the intelligence of the world's peoples Lynn (1991a) found that the highest levels were found in people that evolved in Eurasia (Mongoloids and Caucasoids), with low values found for those that evolved in Africa (Negroids).

The few explanations that have been offered for the evolution of racial differences in intelligence have involved differing strengths of selection for intelligence in various regions. Climate has been the most common source for differential selection for intelligence. These theories have argued that the intellectual demands of life in cold climates was greater than in warm climates. Lynn (1991b) has placed emphasis on the intellectual abilities needed to survive cold, to build fires, and to hunt in groups. Rushton (1995) has presented a theory involving r versus K selection. Miller (1991) has pointed to the need to store food to survive the winter and how this may have selected for intelligence. He has also (Miller, in press) argued that one of the advantages of intelligence was that it helped in detecting deception in mates and potential mates, and that this ability was more important in cold climates than in warm ones. The implicit assumption in these models is that the same alleles were present in virtually all populations. Thus, intellectual differences between populations must reflect differences in the strength of selection for intelligence.

The alternative to be presented here is that some populations were reached more quickly by more of the mutations that produce high intelligence. These became the more intelligent populations. Other populations, those that were less accessible to intelligence increasing

mutations, lagged in intelligence. Thus, the populations reached by the largest numbers of such mutations would have the highest average intelligence. Most populations experienced selection for intelligence, although its strength may have differed.

Stylized Facts

There are several stylized facts (well established generalizations) that will be used in the argument.

1. Much of the current human variation in intelligence is genetic (Bouchard, 1993; Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; Jensen, 1981, Plomin, & Loehlin, 1989; Rowe, 1994).

2. Behavior genetics research suggests the absence of a single gene for intelligence. Instead, intelligence is affected by a large number of different genes (Plomin, Owen, & McGuffin, 1994; Plomin, McClearn, Smith, Vignetti, Chorney, Venditti, Kasarda, Thompson, Detterman, Daniels, Owen, & McGuffin, 1994; Plomin R., McClearn, G., Smith, D., Skuder, P., Vignetti, S., Chorney, M., Chorney, K., Kasarda, S., Thompson, L., Detterman, D., Petrill, S., Daniels J., Owen, M., & McGuffin P., 1995; Skuder, P., Plomin R., McClearn, G., Smith, D., Vignetti, S., Chorney, M., Chorney, K., Kasarda, S., Thompson, L., Detterman, D., Petrill, S., Daniels J., Owen, M., & McGuffin P., 1995).

Wills (1991) suggests 50 genes, each contributing about 3 IQ points is of a plausible order of magnitude. Jinks & Fulker (1970, p. 343) conclude that at least 22 loci seem to be controlling IQ. Later (p. 344), using data for inbreeding depression, they conclude that about 100 genes seem to be showing dominance for high IQ.

3. There has been unidirectional selection for intelligence in much, if not all, of the world. The fact of inbreeding depression suggests that many of the alleles that contribute to low intelligence are recessive, with the alleles contributing to high intelligence being dominant. This suggests that the genes for high intelligence have been the subject of a continual process of directional selection (Jinks & Fulker, 1970, p. 343). Because directional selection acts very slowly in eliminating recessive genes, but quickly to increase the frequency of dominant alleles, a high average level of dominance suggests long continued directional selection for a trait. It is not known exactly what selected for intelligence in the course of human intelligence, but plausible candidates include the intellectual requirements of survival, and the social needs to get along with fellow humans.

4. It will be presumed that each individual has an equal probability of

experiencing an intelligence raising mutation (regardless of the population they live in). This is standard genetic theory, since no population differences in vulnerability to mutations are known. Weakening this assumption would not change the nature of the argument.

5. Favorable genes spread slowly under prehistoric conditions in which humans were divided into tribes that only occasionally exchange genes with each other. There is evidence that humans have built in mechanisms that make them ethnocentric and suspicious of outsiders (Reynolds, Falger, & Vine, 1987). While this does not completely prevent contact and interbreeding between human populations, it does greatly reduce it.

Hiorns & Harrison (1977) compute gene frequencies for 300 generations for 10 populations in a row with one starting out with a gene frequency of 100% and the other zero. Their graphs show that for a migration rate of 5% each generation (the percentage of the populations that marries into the adjacent tribe) and a selection factor of .01, even after 300 generations, the populations are still easily distinguishable. Their analysis led the authors to conclude (pp. 440-441), "This analysis clearly stresses the limitations of migration and reinforcing selection as homogenizing influences on between-population variety in short-term evolution. It seems unlikely, for instance, that should some populations have become fixed for a 'general improvement' gene since the end of the Palaeolithic, or even since the advent of the species *Homo sapiens* as we know it, gene flow and selection would have distributed the genes very far in space or that it would have achieved an appreciable frequency in many of the populations it had reached, through these agencies alone."

Rouhani (1989) uses Fisher's (1937) wave of advance model for the spread of advantageous genes to make this point. Fisher showed, by using a diffusion model, that after a gene was established in a deme there would be a wave of advance for which $V = (1/2)s(s)^{1/2}$, where V is the velocity of the wave, and s is the selective advantage of the allele. The measure of the parent offspring distance is provided by s which in turn equals me^2 , where e^2 is the area of the deme, and m is the migration rate between demes. The parent offspring distance depends on the average distance between centers of adjacent demes, and the percentage of the population that migrates between demes. Increasing the area of the demes increases the distance between them. This increases the average parent offspring distance, and hence the rate of gene flow. This effect will be important later in the argument when the effects of introducing the horse and the ship are considered.

Rouhani uses plausible parameters (selection coefficient of .01, 5% migration between demes, demes 500 people and 5000 square miles) based on

characteristics of current hunter-gatherers, and concludes that advantageous genes would advance at .8 miles per generation. For a favorable mutation to go from South Africa to the China coast would require 400,000 years. Weiss & Maruyama (1976) and Livingstone (1992) use similar assumptions to arrive at somewhat faster rates of advance, but still quite a slow one.

It should be noticed that this is a long period of time relative to the time that many authorities believe has passed since humans left Africa. For instance, if humans reached China 100,000 years ago, a favorable mutation that occurred in China would not have reached Europe or Africa yet, nor would mutations occurring in the latter areas have reached China. Thus, if the original hunter-gatherer social pattern had remained in place, there could be many favorable mutations that are found in only certain parts of the world, simply because there has not been time for them to spread to other parts of the world. This makes regional variation in frequencies of intelligence relevant genes virtually certain.

There is one possibility that should be noted. If one population had a sufficient advantage over other populations, possibly because of their intelligence, or the weapons or organization it made possible for them, this population could expand at the expense of the other populations. Their expansion just distributes the genes for intelligence faster than they would diffuse in the standard stepping stone models. The replacement of the Neandertals by anatomically modern humans could be such an episode. Such replacement can be seen in the fossil record (although even here disproving evolution in place is difficult).

If the differences between populations left no evidence in the fossil record (and the differences between more and less intelligent individuals in modern populations are typically not the sort that would be apparent in skeletal remains), several such rapid replacements could have occurred that left no fossil record, and these may have played a role in disseminating genes for intelligence. Later in this paper, dispersals due to the coming of agriculture, the horse, and ocean going ships will be discussed. The period since the emergence of modern symbolic intelligence is short relative to the time required for mutations to spread around the world (see below).

6. Judging from when they adopted their current symbolic culture, humans have had their current level of intelligence for a relatively short period of time. Of course, there is no direct measure of early human intelligence. However, Stringer & Gamble (1993) document the absence of modern symbolic culture before the upper Paleolithic. Noble & Davidson (1991) argue that there are no signs of symbols in the archaeological record before 32,000 years ago. White (1982) summarizes the differences between the middle and upper Paleolithic, most of

which can be interpreted as evidence for greater intelligence in the upper Paleolithic. Binford (1982, p. 178) states his impression that "the ability to anticipate events and conditions not yet experienced was not one of the strengths of our ancestors prior to the appearance of clear evidence for symboling." Intelligence might almost be defined as "the ability to anticipate events and conditions not yet experienced".

The material culture of prehistoric man was at a very low level before the emergence of anatomically modern man, and gradually increased. The rate of progress was very slow. Although it is just barely possible that humans had a high level of intelligence long before they developed evidence of a sophisticated material culture, and merely did not display their intelligence, the simplest explanations for the long period of a primitive, non-symbolic culture is that humans had not yet developed sufficient intelligence to do more (again see discussion in Miller, 1995).

The interesting thing is that the period in which humans have had a symbolic culture appears to be short in comparison with the time required for genes to diffuse around the world. If high intelligence is recent, the mutations that produced the high intelligence would not have time to reach all populations.

7. The above discussion shows why genes, even subject to favorable selection, are likely to diffuse slowly, with at any given time there being many favorable mutations that have reached some populations but not others.

To make the nature of the argument to come clearer, imagine that each favorable mutation raises the IQ of the individual carrying the mutation by one IQ point. The IQ of an individual will then be determined by the number of favorable alleles he has inherited. The average intelligence of a population will then be determined by the number of favorable alleles that have reached it, weighted by the percentage of the population that has inherited each allele. If, as appears to be the case, genes can go to fixation in one population before they have even reached other populations (see the simulations in Livingstone, 1992), the intelligence of a population can be conceptualized as determined by the number of favorable mutations that have reached it. Let us explore the implications of this simple idea.

Access to Intelligence Raising Mutations Determines Population Average Intelligence

Consider what the above stylized facts imply for the distribution of intelligence among populations. With selection for intelligence, a major determinant of the average intelligence level in a population will be the number of genes favorable for intelligence that have reached the population. As will be shown below, a major determinant of the number of favorable alleles that

reach a population is that population's location, with the more peripheral populations receiving fewer favorable alleles.

Diffusion of Genes

Thinking about the diffusion of advantageous genes on a straight line, it would seem that the middle would be likely to have been reached by more favorable genes than either end.

As the diagram shows, the largest number of advantageous mutations would be expected to have reached the center. The easiest way to see this is to consider a period of time just sufficient for a gene originating at either end (i.e. either A or C) to have reached the center. Now consider a point not at the center, say at B. The genes originating at the left side B would still have reached it, but there would be an area on the extreme right, near C, from whence mutations would not yet have been received. Since this argument can be made for all points not at the center, it follows that the population with the highest expected number of favorable mutations will be the one located at the center. The highest value for a polygenetic trait such as intelligence subject to unidirectional selection is expected to be at that point.

The above point is simple, but most discussions of the evolution of human traits seem to have presumed that the lines in the above diagram would be horizontal, and that human intelligence was rising in a uniform manner. The slowness of gene flow makes this unlikely. If we think of the world as three lines joined at the Middle East (Africa, Asia, Europe), the Middle East would be expected to have received the largest number of advantageous mutations, and the peripheral regions to have received the fewest. The prediction is that during foraging times, the Middle Eastern populations would have had the largest number of alleles conducive to high intelligence. If agriculture had not come, one might have expected this pattern to have persisted into modern times.

For a flat plane the highest level of intelligence would be expected at the center. The argument can be seen on Figure 2. It shows how a favorable mutation originating at C spreads outwards in concentric circles. The diagram can also be interpreted as showing the areas from which which favorable mutations will have been received. At point C, all mutations occurring before T1 will have been received from the area encompassed by the circle labeled T1. All mutations occurring since time T2 inside the circle labeled T2 will have reached point C. The further back one looks, the larger the area there is to draw on for mutations. Now imagine a continent shaped like the ellipse. Consider points A and C. All mutations arising within the areas encircled will have reached both points. The circles are the same size, with the result that the maximum distances from which mutations can reach them are the same.

However, for the hypothetical population at C, the land area within its circle (the circle labeled with B and D) is much less than for the circle centered at A. It follows the peripheral population at C will have benefitted (on average) from fewer mutations than the population at point A.

Thus, it would be expected that the population at point A would have a higher intelligence than the population at point C.

Again, this is a simple point but the prediction is that the more centrally located populations will have been reached by the most mutations. Hence, they will be the most intelligent.

It should be noticed that the above prediction that intelligence should be higher in the more centrally located regions is a logical deduction from several generally accepted facts: that intelligence is affected by numerous genes, that intelligence has been selected for during relatively recent prehistoric times, and that favorable mutations diffuse slowly. Anyone wishing to dispute the conclusion, that the centrally located populations should have a higher frequency of the genes for intelligence, has to dispute one of the generally accepted facts, or dispute the logic. Either is hard. The predicted forager pattern might roughly fit the data if Australia and America are thought of as peripheral regions with small populations (i.e. few advantageous mutations) and slow diffusion of advantageous genes originating elsewhere. Both Australia and America have lower intelligences than Eurasia (Lynn, 1991a).

Before discussing the implications of agriculture, let us discuss further how fast favorable genes might migrate in a foraging population. This speed should not be taken to be constant.

Foraging Populations with Population Density Varying

If intermarrying tribes are roughly constant in population size (as they are believed to be), the distance to the boundaries of a tribe will be much less in low population density areas. In such low density regions the population ranges over larger areas, and bands will be separated by larger distances. Those of marriageable age have to look much further to find mates. Thus genes would actually flow fastest through such areas. In essence, they would travel many more miles before they hit a tribal boundary.

A few wide ranging tribes could pick up the genes at one end, have them increase in frequency within their populations, and then transmit them to the other end of their territory. Once this had been done, many more miles would have been covered than would have happened in a more densely populated region, where many tribal boundaries would have had to be crossed. One implication is that thinly populated areas like the Sahara may have been less of a barrier to the flow of favorable genes than thought (they could remain a barrier to neutral genes) (Miller, 1994a).

This argument of course makes the differences observed between the north and south of the Sahara desert more puzzling Cavalli-Sforza, Menozzi, & Piazza (1994). Probably most of the genes for which it appears a barrier are selectively neutral, or subject to only weak selection. With only diffusion, a small desert population can have little impact on the adjacent populations.

Thinly populated areas actually may act as genetic freeways. Consider the situation shown in Figure 3:

Each rectangle is a tribe. The wide rectangles (only one of which is completely shown) represent low population density tribes. A mutation appearing in any square is equally likely to be transported to any adjacent square, where it then proceeds towards fixation. After a period of time, the mutation is carried to an adjoining tribe, represented by a rectangle. Thus, the arrows leaving square A show how a favorable mutation might be transported. After the first period, the mutation is present in adjacent populations only. If the whole diagram was like the lower two rows, there would be waves of mutations moving across the diagram in the manner Fisher described, but it would take a long time for a mutation arising at one end to reach the other end.

Now consider the situation with low density populations to the north. Mutations arising in the lower squares will quickly reach the upper rectangles. They will then move rapidly east and west. These low density regions then serve as freeways transporting advantageous mutations to other regions. As illustrated, the mutation reaches B and D in the first period. In the second period, the mutation is transported to each of the rectangles adjacent to those reached in the first period. It can be seen that the distant rectangle E is reached at the same time as the much closer rectangle C. The mutation was transported to the low density area D, where in the course of dispersing within the tribe it was quickly carried to the far boundaries. From there, it readily diffused to the population E. Thus, the low population density area served as a genetic freeway transmitting the favorable mutation from A to E, much quicker than if it had to traverse the intervening series of small squares. The tribal boundaries are major obstacles to gene flow. The number of boundaries to be crossed determines the speed with which favorable mutations move. The number of boundaries to be crossed in going A, B, C is the same as the number crossed going A, D, E. Thus, tribes C and E will receive the mutations at about the same time, even though E is much further away.

The transmission might be even more rapid if the populations were very mobile themselves, as might happen for pastoralists (see discussion below), or northern groups following mobile herds of game (i.e. reindeer). The steppes of Eurasia might have been such a freeway, picking up genes from populations around the boundaries of Eurasia and carrying them to the other ends. They may have delivered them to Europe and North Asia at either end.

Empirical evidence on the size of tribes is thin, but it does appear that the area occupied by a tribe increases as the environment deteriorates. There is a tradition in anthropology that tribes have about 500 members. If tribes have an equilibrium size of about 500 (see Kelly, 1994, for an evaluation of this tradition), in low density areas the tribes must occupy larger areas in order to reach this population size (which is argued to be roughly the number required to provide adequate mating opportunities).

Empirically, Birdsell's (1953) examination of the relationship between the area occupied by an Australian tribe and the rainfall showed that tribal areas were larger in the drier climates. After excluding the tribes which depended on resources that were not likely to be affected by local rainfall (island tribes, coastal tribes, and tribes on large rivers fed from outside the tribal territory) and by the elimination of tribes in which cultural factors modify the size of the population from the assumed constant of 500 persons, the area occupied by a tribe (Y) and the rainfall (X) was: $Y = 7,112.8 X^{-1.58451}$

Since area goes up as the square of a linear dimension, the linear dimensions of the territory of the tribe (L) will vary as approximately $X^{-3/4}$. Thus, the distance between tribal boundaries increases as the rainfall declines. In very dry areas, such as the interior of Australia or the prehistoric Sahara, distances between tribal boundaries would be appreciably greater.

In a low density area, like the Sahara, the genes should have to cross fewer tribal boundaries to cover any given distance. As Birdsell (1951: 282) put it in discussing Australia in an earlier paper, "Considered in terms of the rate and ease of gene flow, the great, forbidding, arid desert spaces of the central portion of the continent represent freeways, rather than obstacles, to gene exchange between distant populations."

He provides evidence, from the spread of Carpentarian characteristics in Australia, that genetic diffusion is indeed as would be predicted from a model where tribal boundaries are an obstacle to gene flow, and the boundaries are further apart in areas of low rainfall. This leads to the hypothesis that in Eurasia, as in Australia, the central part of the continent with its low population densities may have constituted a freeway that permitted favorable mutations to move faster than they would have if population densities were higher. For instance, mutations originating in the densely populated area of China could have moved through thinly populated Central Asia to Central Europe faster than if they had to diffuse along the coast of China, reach India, traverse northern India, and then moved through the Middle East, and the Balkans.

The Role of Agriculture

It was discussed above how Rouhani (1989) estimated that the rate of progress of advantageous genes would be only .8 miles per generation for a hunter-gatherer population. This slow speed is predominantly due to the low intermarriage rates across tribal boundaries, which in turn arises from tribes being endogenous. Genes can move faster if whole populations move, since even on foot, people can move faster than .8 miles per generation. It is not known how often favorable genes were carried forward by the movement of tribes, although it is easy to imagine that this occurred.

Movement of genes could have been faster with the coming of agriculture. It has been argued that agriculture was spread by demic diffusion. A settled way of life increases the population growth rate, and farming populations would be expected to expand into adjacent areas that were

inhabited only by foraging populations. Cavalli-Sforza, Menozzi, & Piazza (1994, pp. 108-111) present evidence that the expansion of agriculture into Europe was at about the rate of one kilometer per year. The kilometer per year advance of genes by demic diffusion would far exceed the .8 miles (1.3 kilometers) per generation estimated (see above) for a foraging population. With a generation of 20 years, this is about 25 times as fast as genes would diffuse through a foraging population.

Their evidence suggests genes of the agricultural population were carried along with the expansion of agriculture. There was a continual mixing of the expanding agricultural population with the hunter-gather populations of the regions they were moving into. Thus, any advantageous mutations that had occurred in the hunter-gather populations would probably be picked up and carried by the expanding farming populations into new areas. This wave of advance carried both the original genes of the first population to adopt farming, and of the intervening foraging populations. The Middle East is likely to have been a central area during the hunter-gathering period when intelligence was high.

It should be noticed that the accelerated pace at which genes move during a demic diffusion of agriculture is a one time effect. After the spread of agriculture, population density would increase. It would then be expected that tribes would shrink in size and the distances to be traveled to find a mate would decrease. In addition, agriculture involves a sedentary life which would reduce the natural movements of foraging people which might bring them into contact with other groups. The situation might come to resemble that in New Guinea with a very large number of tribes each speaking their own languages, and doing relatively little intermarrying (Cavalli-Sforza et al. 1994). This would cause the post-agricultural revolution rate of spread of new mutations to decrease to a level below that of the foraging period.

However, not all areas would have adapted agriculture. Those areas that were too dry, or otherwise unsuitable would have retained a foraging life style. These thinly populated desert and steppe areas would remain areas of low population density able to serve as genetic freeways moving genes from one area to another. In particular, the thinly populated Central Asian steppes may have served as a genetic freeway connecting the densely populated agricultural areas of China, India, the Middle East, and Europe. With mutation rates being the same in the different populations, most of the favorable mutations would occur in the agricultural areas where most of the world's population lived. However, the thinly populated Central Asian area would have received these genes and transmitted them to other parts of Asia.

If within the farming population there was selection for intelligence, the genes once introduced into a population would move towards fixation. This demic farming diffusion model predicts higher intelligence levels in the farming communities after the agricultural expansion, because more of the genes for intelligence would have reached them.

It would also be expected that the greatest number of genes for intelligence would have reached

the areas that were settled at the end of the agricultural expansion. The reason is that the wave of advance would have picked up the largest number of favorable mutations. To illustrate, consider a series of tribes arrayed along a straight line A, B, C, D, E, F. An agricultural expansion begins among A. Its expansion brings it into C. A favorable gene that had emerged in C passes into the expanding population, and begins to increase in frequency. Meanwhile, the favorable gene is carried with the wave of advance. Additional favorable genes may be picked up from D and E. Thus, when the wave reaches F, it is likely to have picked up any favorable genes that were in the foraging populations that the wave traversed. Thus, it is the populations that are last reached by the wave of advance that are likely to have picked up the largest number of favorable genes.

This argument would hold even if the first population to adopt agriculture was no more intelligent than other foraging populations. It could even work if the farmers were less intelligent. However, the first farmers may have been more intelligent. It is possible that intelligence was needed to conceive of the idea of planting crops and cultivating them. This is not to say that the first to conceive of planting seeds and farming actually did so.

Hunting and collecting takes less work than farming. It is likely that the fact that seeds grew into plants, and that farming was possible was discovered several times. It was then promptly forgotten since it was easier to gather what nature had already planted. However, eventually population may have risen to the point where adequate food was not gathered by hunting and gathering, and planting increased the food supply. At that point, someone conceived of farming, implemented the idea, and encouraged his descendants to do so. The first farmer was very likely more intelligent than most. He was also likely more farsighted since he could visualize the harvest vividly enough to inspire him to do the work of planting for a return that will come only many months from now. Once farming was adopted by a few pioneers, their descendants were more numerous, and their genes spread. The initial advantage was partially a better food supply, but it may have also been the adoption of a sedentary way of live that permitted women to have the next child before the first was old enough to walk long distances on its own (Lee, 1972 as cited by Ammerman & Cavalli-Sforza, 1984, p. 64). The problem of carrying two children at once in a migratory lifestyle is believed to have limited foragers to having only one child young enough that could not walk at his parents' pace. Because adopting farming required intelligence, and because farmers probably out reproduced others, farming's appearance would have been accompanied by increased intelligence.

However, even if the initiation of farming did not require any special intelligence, the first farming population may have been unusually intelligent. The first farmers are believed to have been Middle Eastern. As discussed earlier, the Middle East is a central region receiving favorable mutations from Asia, Europe, and Africa. Thus, at any given time, populations in this area are likely to have received more favorable mutations than populations in other regions. Evidence is that farming was carried into Europe from the Middle East by movement of farming populations. Such movements would have carried the genes for intelligence that had reached the Middle East from Africa and Asia into Europe (Europe presumably already had the genes that

had emerged there). This demic expansion from the Middle East into Europe can explain why modern Middle Easterners do not appear to be more intelligent than Europeans, even though the earlier theoretical argument suggested that a greater number of favorable genes should have reached them.

Cavalli-Sforza et al. (1994) report that the gene frequency differences between European populations are relatively small and that European gene frequencies resemble those of the Middle East. In dendograms (descent trees) the branch leading to Europeans is often relatively short. A very interesting study discussed by Cavalli-Sforza et al., (1994) analyzed only a few populations (including Chinese, Europeans, two populations of African pygmies, and Melanesians), but collected data on a very large number of alleles. A tree constructed from this data showed a very short branch leading to the Europeans (p. 91). Several explanations were considered, but the most plausible was mixture. Calculations showed that the European gene frequencies could be explained well by a mixture of Chinese with a smaller percentage of pygmies. Obviously, this is not the actual racial history of the Europeans (who are both taller and lighter skinned than either group, for instance). The pygmies are fairly close to other Africans in the frequency of their measured genes (the set of measured genes frequencies includes no genes that affect height) according to their data.

The above surprising result is most easily explained by the current European gene frequencies reflecting a relatively recent (in prehistoric terms) migration of a Middle Eastern population that was in turn a mixture of Asians and Africans (or at least one which regularly received genes from both). After expansion, the gene frequencies were frozen, and drift did not change them much from those that had existed in the Middle East.

Renfrew (1991) and Barbujani, Pilastro, Domenico, & Renfrew (1994) argue that not only do European gene frequencies suggest demic diffusion from the Near East, but evidence of such demic diffusion can also be found in the areas occupied by the speakers of Altaic languages, and by the Asian speakers of Indo-European and Elamo-Dravidian languages, and possibly the Afro-Asian languages. The basic argument is that agriculture emerged in the Near East among several groups in the Fertile Crescent. One wave of expansion swept into Europe carrying the Indo-European languages with it. The existence of this wave is documented by the distribution of gene frequencies in Europe, and by archaeological evidence which shows a steady advance of farming at about 1 kilometer per year. It is hypothesized that another wave, possibly starting in the Zagros foothills of Iran, led to an expansion of the populations that become Elamo-Dravidian speakers. This wave reached as far as southern India. Later, Indo-European speakers expanded into Iran and North India, leaving the Dravidian speakers isolated in South India, with a couple of relict populations isolated along the expansion path. Of course, these theories are highly controversial, with most linguists rejecting the idea that the origins of the language groups go back as far as the origins of agriculture.

The Altaic speakers are argued to have spread north from the Fertile Crescent area, expanding

all the way to Korea and Japan. Along the way they would have had the chance to pick up and spread genes for intelligence in the large area from the Middle East to Japan. Finally, the Afro-Asian speakers spread from the Levant into Egypt and then on to the rest of North Africa. Even if these arguments are rejected, the existence of these language groups is generally agreed to be due to the languages having a common origin. The spread of the language from the area of common origin must have been accomplished by the movement of people, even if only small groups of conquerors (see discussion below). Of course, if the movements were later than the origin of agriculture, there would be less time for favorable genes to be selected for.

In the case of all of these expansions, the argument being made is not that the early farmers were necessarily any more intelligent than the foragers whose territory they expanded into. Instead, the argument is simply that, due to the mixing of genes from a larger area, a larger selection of advantageous genes would have reached the populations affected by the agricultural expansion. If the genes were merely neutral, the resulting mix would be a weighted average of the gene frequencies of the constituent populations. However, with directional selection for higher intelligence, having a wider selection of intelligence related genes for selection to work on would have resulted in the eventual evolution of higher intelligence. Thus, even if the evidence of a common language family reflects only a conquest, a few new genes would have been introduced.

Once agriculture had spread into an area, the rate of gene flow would be expected to decline again. Agriculture would support a denser population, and one that was less mobile. In a denser population the distance that must be traveled for a mate is less, and the average distance between the partners in a marriage is less. Languages and dialects would differentiate, and these differences would prevent marriages between different groups. Tribal groups would come to occupy smaller areas, and would be expected to be endogamous. Thus, the rate of diffusion of genes would be limited by the boundaries of the tribal groups, and the short distances from one boundary to the other would again limit the gene diffusion. The situation might come to resemble that in New Guinea where there are large number of tribes occupying a relatively small area, with large linguistic and genetic differences between the tribes. In such an environment new intelligence raising genes would spread very slowly. (That is, they would spread slowly unless something again happened to cause large scale migrations of new peoples).

It should be noticed that if the numerical size of demes remains constant (say at the traditional 500), changing population density uniformly does not change the rate of advance of a trait undergoing unidirectional selection, such as intelligence. The total number of mutations at any given distance is increased as population density increases, but the number of deme boundaries to be crossed is also increased as each deme comes to occupy a smaller area. A way to see this is to think of the demes as being in a hexagonal grid, with the demes arranged in concentric circles around the deme one is interested in. At any given time, the mutations (if any) from a certain number of demes away are reaching the target deme. Changing the size of the demes does not change the number of boundaries that must be crossed for mutations arising say 20 demes away

to reach the target deme. If, say after 100,000 years, mutations 20 demes away are just reaching the target deme, it makes no difference how large the demes are in a model in which members of a deme are equally likely to mate with any other member of the deme. The distance to the deme that is 20 demes away just happens to be less when the population density is lower.

Of course, as pointed out, where the problem is expressed as time to cross a specified distance, lowering population density lowers the number of boundaries to be crossed, thus speeding up the time required for a gene to cross the boundaries.

Increasing the heterogeneity in the population densities will decrease the number of boundaries to be crossed to connect two distant demes, since the gene flow will be through the low density areas between the centers for high population. The coming of agriculture probably did increase the heterogeneity of population density. The areas that adapted agriculture were the areas of higher rainfall, which were probably already areas of relatively high population density. Agriculture just increased their population densities further. The areas of low rainfall, which were already areas of low population density, would have remained foraging areas of low population density. Thus, the heterogeneity increased.

Horse Based Migrations

There is evidence for several migrations after the early spread of agriculture. These are the migrations that are usually interpreted as giving rise to various major language groups (The Renfrew hypothesis discussed earlier that agricultural expansion gave rise to the Indo-European language groups is a minority view). For instance, there is a linguistic similarity between the various languages of the Indo-European group which extend from India to Western Europe. This is usually explained by these languages having a common origin, implying that the speakers of the proto-Indo-European language once lived in an area small enough to have a common language, estimated by Mallory (1989, p. 146) at 250,000 to 1,000,000 square kilometers. Obviously, for the Indo-European language to now cover the very large area they do cover, there must have been an expansion of the language, which was almost certainly caused by a movement of at least some people, even if just a few conquerors. Mallory estimated that the proto-Indo-Europeans were in their homeland 4500-2500 years B. C. They expanded from this homeland. Why they expanded is not definitely known, but one plausible explanation is the domestication of the horse, and the advantage this gave them in warfare.

Domestication of the horse occurred around 5,000 BC or earlier. RThis innovation cut traveling times by a factor of five or more, nullifying whatever territorial boundaries had previously existed. . . . Riding provided the ability to strike out over great distances, instigated cattle looting or horse-stealing raids, the accumulation of wealth, trading capacities, and the development of violence and warfare. Material remains of the first half of the 5th millennium B. C. show that in an enormous territory east of the Don River and between the Middle Volga, the Caucasus Mountains, and the Ural Mountains there spread a uniform culture.S (Gimbutas, 1991,

p. 354). Very likely this uniform culture arising from the mobility horses permit mixed the genes thoroughly, and much more quickly than normal diffusion could have mixed them. Gimbutas and others have argued that the advantage of the horse would have led to the expansion of the first peoples to have mastered it. This would have rapidly spread intelligence promoting genes. The effects of the initial expansion were followed by a period of faster gene flow resulting from the horse based culture.

Not only is the horse a major asset in warfare, but a pastoral economy seems to lead to an emphasis on fighting. This is basically because the development of an economy based on livestock changes the cost benefit-ratio for raiding, making it a much more economical source of food. Livestock is easily driven away. In contrast grains and tubers must be carried away (and perhaps even harvested). Foraging people seldom have much worth raiding for (other than women). Faced with the threat of raids, those owning livestock are forced to develop fighting skills to defend their livestock. Even today, herding people seem more oriented towards fighting. Since the horse domesticators were probably a pastoral people, they would be expected to have developed a livestock raiding culture. With the military advantage of horseback riding adding to culture oriented toward fighting, they very plausibly could have expanded into surrounding peoples, as Gimbutas (1991), Mallory (1989), Anthony (1986) and others have argued. The case for such an expansion is based on both archaeological evidence, and the widespread prevalence of the Indo-European languages. Such an expansion presumably carried genes.

Of course, for the spread of Indo-European languages, it is not necessary for the original inhabitants of an area to be displaced. Conquest by a relatively small group can lead to the adoption of the conqueror's language. The classic example is the adoption of Turkish in what is now Turkey, which is known to be the result of a conquest by a relatively small number of Turks.

However, the introduction of a small number of advantageous genes would not require many people, especially if the leaders of the conquering army were more likely to be carrying the desirable genes. It is very likely that achieving and retaining leadership of a conquering army was facilitated by intelligence. It is also very likely that the conqueror's leadership had an above average chance of leaving their genes, through either marriage or rape. Once the genes had been introduced into a population, if there was selection for such genes, they would gradually increase in frequency. Genetic evidence for an expansion from the steppes exists.

Cavalli-Sforza et al. (1994, p. 293 and fig. 5.11.3) found that the third principal component for European gene frequencies showed an area of extreme values north of the Black Sea, with what appear to be roughly concentric circles around this area. They point out that this is consistent with an expansion of the Kurgan culture from the steppes of Europe such as Gimbutas argued for. They also note that Scythians were in the same area later, and also invaded Europe. It could also have been the original homeland, or an intermediate long-term homeland for some of the

other barbarian populations that later invaded Europe.

The Indo-Europeans' original homeland is a subject of disagreement. For the sake of discussion, imagine it was in the steppes north of the black Sea (as above) or north of the Caspian Sea as hypothesized by Gimbutas, with expansion from here going into Europe and further east into Asia. Any mutations for intelligence between the homeland and Western Europe would have been swept up by the migrating populations and spread into Europe. In the long period of time since 4500-2500 years BC there would have been time for these genes to benefit from selection, and to increase in frequency.

Similar effects could occur with other homelands, although the magnitude of the effect might vary. For instance, if nomadism was introduced into the steppes from the farming populations on its western edge (in the Ukraine or Rumania), the steppe populations might initially have had gene frequencies similar to those populations and a later movement into parts of Western Europe might have brought fewer new genes. However, they still might have picked up genes from further east in the course of subsequent movements, and then brought these into Western Europe. Of course, with a more western origin of the steppe nomads, the latter movement into Iran and India would have brought into these areas genes originating in western Europe. Thus, regardless of where the population that spoke proto-Indo European is believed to have originally lived, the movements of the parts of this population that spread the Indo-European languages would have spread intelligence promoting mutations, the more favorable of which would have been selected for.

Notice, for the above effect to occur, it need not be argued that the new arrivals were more intelligent than the conquered. They may have been less intelligent, with the conquest's immediate effect being to lower the average intelligence. However, if the new arrivals had genes for intelligence that had not yet reached the original population, the net effect after a long period of time, could have been to have raised the intelligence of the combined populations above that of any of the original populations. For instance, consider the unrealistic case where genes have become completely fixed in a population. The settled farmers have two favorable mutations fixed, and the invading populations one. The invaders are lower in intelligence. The immediate effect of mixing the populations lowers the intelligence below that of the original residents. However, with selection for intelligence after many generation the newly merged population may come to have all three alleles in high proportion, and to have an intelligence higher than that of either of the predecessor populations.

Thus, to argue that the Indo-European expansions contributed to raising intelligence one does not necessarily have to argue that the Indo-Europeans were themselves superior in intelligence. They may have merely played a role in spreading desirable mutations widely. Of course, the original Indo-European expansion is just one of many expansions by steppe horse riding populations.

Many expansions of steppe peoples are known to have occurred in history such as the barbarians that invaded the Roman Empire (Cavalli-Sforza et al. 1994, Fig. 5.2.6), and later the Magyars and Mongols. It is very likely that the steppes of Eurasia were traversed in both directions several times by horse-mounted conquerors. China was repeatedly conquered by horsemen from the steppes of Asia (Cavalli-Sforza et al. 1994, p. 201-202; Darlington, 1966). In particular the Hun that sacked Rome, under Attila, those that attacked India under Mihirakula, and the Hsuing-nu who threatened China were apparently the same group, spreading their genes over this vast Eurasian area (Kust, 1983, p. 36). Any favorable mutations arising between China at one end, and Europe at the other were probably diffused throughout the Eurasian region. Similar arguments could be made for these other expansions, although after the later expansions there would be less time for natural selection to increase the frequency of any desirable genes introduced. Again, if the conquerors' leaders were more likely to carry genes for intelligence, and these leaders fathered many offspring, newly introduced genes might have had a head start that was more important than might have been guessed from the numbers in the conquering army.

More recent horse-borne long distance movements are known, including that of the Turks (see Mallory, 1989, p. 147 map), or that of the Arabs out of Arabia into North Africa, Spain, etc. Each of these could have spread favorable genes.

It is also very likely that horse-riding societies permitted choice of spouses over relatively large areas. The horse provided mobility, and the lack of attachment to a fixed place that farming people had would permit groups to gradually change their locations. Pastoralism often leads to seasonal movements which may cover from 20 to 1000 miles or more (Cavalli-Sforza et al. 1994, p. 200). These may bring the nomads into contact with different sedentary populations at different times, or into contact with other nomadic populations. Hence, genes can be presumed to have moved very rapidly in the areas of the world populated by horse-mounted people. Thus, the great steppes of Eurasia appear to have been a freeway that transported desirable mutations from one end of Eurasia to the other end. This happened long enough ago so that there were often several hundred generations for selection to increase the frequency of the genes that made for intelligence. The result was the evolution of high intelligence within the peoples within the reach of the horse-riding Eurasian populations. These appear to have extended from Japan, Korea, and China at one end to Western Europe and North Africa at the other end.

Could lack of access to the horse have slowed down the spread of genes? Many areas of the world lacked access to horses till recently. The Americas, Australia, and New Guinea lacked horses because they were isolated by water from Eurasia, where the horse was domesticated. Sub-Saharan Africa is contiguous to areas that used horses, but because of the tsetse fly did not have domesticated horses. In these areas populations would have moved on foot. Tribal size would have been smaller. Favorable mutations would have moved slowly. Over time they would come to have a lower level of intelligence than the lands whose gene flows were facilitated by horses.

Boat Migrations and Trading

Another method that could carry favorable mutations over long distances is boats. Once long distance boat transport had emerged, mutations could cover long distances without having to diffuse slowly through populations.

The earliest example of such long distance boat based migrations is that of the Phoenicians who settled such places as Carthage. This could have moved mutations at an even more rapid rate than horse based migrations.

It might be noted that the Phoenicians were located at the Middle Eastern crossroads where they may have received genes from Asia, Europe, and Africa. Their early colonies could have transported these genes to distant places from whence they spread. This may have contributed to the spread of Middle Eastern genes throughout Europe.

As with other innovations, it is plausible that the people that first perfected long distance ship transport may have been above average in intelligence. If this was so, the ability of the ship to carry them long distances would have dispersed their genes widely. From the initial colonies, the genes would have spread to adjacent peoples, and then spread rapidly in frequency.

Of course, after the Phoenician era, the Greeks established a far flung set of colonies, extending to the Black Sea Coast and around the Mediterranean. After that the Roman Empire emerged. It was centered on the Mediterranean and experienced large scale migrations of peoples. This could have easily transported favorable mutations from one end of the Empire to the other. With a large number of generations since this era, natural selection could have served to raise the frequency of the desirable genes throughout the Mediterranean region, and areas in contact with it.

It should be noticed that the ship also led to extensive long distance trade. If ancient sailors and merchants were like modern sailors, they left genes behind them. From the ports, genes could have easily spread inland.

Certainly, the traders and ship captains were well above average in intelligence. It is very likely that soon after a intelligence increasing gene reached a population, some of those receiving the gene went into the intelligence requiring profession of trading (where those with the high IQ have a comparative advantage). Since the traders tended to be travelers, the gene may have been at an over 50% frequency among those going on trading trips even when it had a much lower frequency in the population as a whole. This could speed up the diffusion of the gene among people who did long distance trading.

It is also very likely that offspring of traders became traders themselves, and that the traders in a

community intermarried extensively. This could make an advantageous gene move faster than with random marriage. Suppose for instance an advantageous gene emerged in Central Asia and was carried to the Black Sea's east coast. One could easily imagine a Phoenician trader bringing home a concubine or slave carrying the gene. This match could easily give rise to a son who then signed on to participate in a trading trip to England's Cornwall tin mining district, where he mated with a prostitute. Thus, in two generations a gene could make it half way across Eurasia. This sequence of events is much more likely if traders were drawn from sons of traders, than if they were randomly selected from the whole Phoenician population. In the latter case, it might take many generations for the gene to slowly increase in frequency before it reached someone who was making a Cornwall trip. Such long distance gene transport would be of little importance for neutral genes, since the percentage of genes in Cornwall that could be traced to the Black Sea Coast would be small. However, if the gene did raise intelligence and was hence selected for, the gene could come to have a high frequency in Cornwall, and diffuse from there to the rest of England. The parts of Eurasia (and North Africa) connected by long distance trading routes would tend to have their intelligence raised as intelligence promoting genes were spread over long distances.

Negative Selection for Intelligence

The above discussion has been on the assumption that high intelligence was selected for. Such positive selection for intelligence is plausible in many societies. Intelligence would help in attracting mates, and in achieving positions of leadership that led to mating opportunities. It probably also assisted in earning a living and hence promoting the feeding and survival of one's offspring, as well as in arranging advantageous matches for them. However, in more recent times intelligence may not have contributed to reproductive success. In most modern industrial societies, the high socioeconomic status and educated individuals have fewer children than those with low status and poor educations (Herrnstein & Murray, 1994; Itzkoff, 1994). This seems to occur especially with females. Females postpone marriage and child bearing to obtain an education. They find a conflict between a high status occupation and child rearing. (Women also find a conflict between low status occupations and child rearing, but find it easier to sacrifice a low status, uninteresting occupation for child rearing). Also, low intelligence seems to lead to more failures at contraception and additional births. However, these conditions appear to have risen only recently with changing status for women, and the emergence of modern contraception.

There may have been earlier selection against intelligence. Most likely, the population of cities in Medieval Europe and early modern times failed to reproduce themselves, primarily because the high population density facilitated the spread of disease. The population was maintained by continual immigration from the surrounding countryside.

In at least some circumstances, it is likely that those that immigrated to the cities (and remained there) were of higher intelligence than those that remained in the countryside. The cities probably had

a higher proportion of occupations for which high intelligence was an asset, including craftsmen, traders, and government officials. Intelligence was probably not as much of an asset in peasant agriculture. It is possible (but unproven) that high intelligence by encouraging movement to a city (and being able to earn enough to stay there) was actually selected against in some times and places. If the selection for intelligence disappeared, the areas of the world where genes were being well mixed would no longer have a tendency to have their intelligence raised.

Implications for Other Genes

The argument has been developed for genes that raise intelligence because that is a socially desirable trait that many believe to have been subject to unidirectional selection for most of human history. However, the principle is perfectly general that conditions producing the long distance importation of new alleles lead to the increase in the receiving area of any trait subject to unidirectional selection.

In a region where malaria was endemic and malaria resistance was being selected for, one would expect more mutations resistant to malaria to have reached the areas that were exchanging genes over long distances than the areas that were relatively reproductively isolated.

There may be other traits that have been subject to selection in much of the world. In northern climates, a common strategy for getting through the winter was storage of food. It was also desirable to devote effort to the building of homes that would protect from the cold. In modern economies, this ability leads to saving and investment in productive resources. In prehistoric tropical societies there was little opportunity for planning ahead. Thus, the populations that moved out of the human cradle in Africa have probably been under selection for the ability to defer gratification. This trait would be expected to be most common in the areas that have received genes from a large part of the world.

Testable Implications

The above account appears to be congruent with what is known about the worldwide distribution of intelligence. High intelligence is reported for the populations of Europe and Northeast Asia (China, Japan, Korea) which are at each end of the Eurasian steppes (Lynn, 1991a). Areas that are isolated from Eurasia by water, and of smaller populations (Australia and the Americas) have lower scores even when the populations are living in relatively cold areas that might be thought to have selected for intelligence.

In the above model, Australia and the Americas are peripheral areas. Their populations were probably too small (in relation to the Eurasian populations) to generate many mutations, and they were probably too far, or too isolated to receive many mutations from the Eurasian land mass. Elsewhere (Miller 1995), I argued that these continents were sufficiently isolated that mutations occurring on the Eurasian land mass since their initial settlement probably had not

reached them. Even if I am wrong, and there has been some gene flow since initial settlement, it is likely that their positions far from the Eurasian population centers caused them to be very peripheral, limiting their access to intelligence increasing mutations. Thus, they would have been expected to have lagged behind Eurasia in the development of intelligence, as the data shows them to do (see Miller, 1995 for detailed documentation).

Lower intelligence is found in Africa, and among those of African descent. This can be plausibly argued to be due to weaker selection for intelligence in a tropical climate (Miller, 1991, in press) along with the isolation caused by lack of horses and poorer access to water borne trade (and traders) in earlier eras. The poorer access to water borne trade would be due to poor harbors on the coast, a lack of inland seas, and a lack of navigable rivers flowing down to the water.

What other predictions emerge? Right now, while the evidence is quite strong that there are genes that contribute to intelligence, exactly what these genes are and where they are located is unknown. However, evidence has recently been presented that certain genetic markers are statistically more common in those of high intelligence than in those of low intelligence (Plomin, et al, 1994; Plomin et al, 1995; Skuder, et al, 1995), and one has been found that appears to affect spatial ability without affecting intelligence (Berman, & Noble, 1995). Given the rate of progress in molecular genetics, it is likely that several alleles that have a positive or negative effect on intelligence will soon be located. If the above theory is right, not only will these genes prove to differ in frequency between populations in different parts of the world, but some of the ones identified in European or northeast Asian populations (the populations most commonly studied, simply because they are the populations that are most convenient to the leading laboratories) will be found to be essentially absent (a low frequency may be the result of recent mixing with Europeans) in the original aboriginal populations in such areas as Australia and the Americas.

The above theory raises the possibility that certain alleles with a favorable effect on intelligence may have become fixed in European or Northeast Asian populations if they originated in these regions, (and possibly even if they originated elsewhere but reached these populations early enough for natural selection to fix them). Studies that are limited to just one group (such as Caucasians or Japanese) may not detect a correlation of these genes with intelligence.

A good example is provided by the high-affinity aldehyde dehydrogenase gene, which comes in two versions in Orientals (Tu & Israel, 1995). One version provides protection against alcoholism because they cannot easily digest the aldehyde that is produced after alcohol consumption. The aldehyde makes them mildly sick. This simple genetic difference can explain most of the difference in drinking within the Oriental population in North America. However, the allele that is common in Orientals is virtually unknown in Caucasians. Studies limited to Caucasians would not have discovered this genetic effect.

The above argument would suggest that mixed populations (such as American blacks, or those of mixed Australian aboriginal and Caucasian descent) might very profitably be investigated. A finding that possession of a particular genetic marker was correlated with intelligence would suggest that that marker either directly affected intelligence, or was close to a gene that affected intelligence. Of course, in populations that are a mixture of two populations that differ in intelligence, any gene that differs in frequency may be merely serving as a marker for the extent of admixture (not to mention for the extent of acculturation).

It would be necessary to control for this. For instance, if there were other genes that were believed to be unrelated to intelligence (possibly from studies in other ethnic groups), but which did differ in frequency between the two parent groups, these could be used to estimate the degree of admixture. Many genetic markers, including blood group, human leukocyte antigen genes, and restriction length polymorphisms, are known to differ between populations (Cavalli-Sforza et al. 1994). Thus, it should be possible to estimate the extent of admixture independently of the genes believed to be linked with intelligence. Independent measures of acculturation would have to be sought as a control. This differs from the procedure of the major quantitative tract loci study of intelligence so far (Plomin, et al. 1994), which limited itself only to Caucasians.

It was argued that some isolated areas such as Australia may have received few new mutations after settlement. However, if they experienced continued selection for intelligence, some of the alleles that the population arrived with may have become fixed, or nearly fixed in their populations. In this case, the standard deviation of intelligence should be smaller in such populations than in the populations that have been continually receiving new genes from other populations. This is a testable prediction.

Africans are generally found to have somewhat lower standard deviations for intelligence than Caucasians (Jensen, 1980). This might be explained if a slower migration of alleles into Africa and within Africa had resulted in African populations having fewer polymorphic intelligence relevant genes. Many intelligence relevant alleles would have reached them so long ago that they had become fixed, and many other alleles would not have reached them yet, even if they accounted for appreciable variation in other populations. In the areas that have had continual access to new mutations there will be more alleles that have not become fixed, causing a greater standard deviation of intelligence.

Implications for Variability in Intelligence

Incidentally, this ongoing process of new mutations coming into a population followed by selection for them may be the way to resolve the paradox of why there is so much genetic variation for intelligence (g), if g is a trait that is beneficial. Some have pointed out that variables that are subject to strong selection normally show little variability. Usually such variables reach their equilibrium values quickly, and are now observed in the process of

reaching equilibrium.

For instance Patterson (1995, p. 210) gives great weight to Vale's (1980, p. 435) rhetorical question, "If IQ is a fitness character, why should the additive variance be anywhere near .71?". Vale goes on to argue, "The answer of course is that it should not, if indeed IQ is closely related to fitness. If it is not so related, then presumedly it has not been selected for throughout human evolution. If it has not been selected for, then it evidently has not played a very great role in that evolution."

In general, a trait can be contributing to fitness and be being selected for without the trait having reached its genetic limit, although powerful selection makes it more likely that the limit will be rapidly approached, making it harder to observe the organism in the process of being selected. For a trait subject to the type of selection in which one animal having the trait increases the benefit of a even higher level of the trait in another individuals (the so called arms race or red queen effect, see Ridley, 1994), the period of adaptation is increased. If intelligence is subject to unidirectional selection in which people with a higher intelligence benefit reproductively from being able to outwit those of lower intelligence, it is likely that at any given time there will be some of higher intelligence than others, thus solving the problem. Still, in general Vale and Patterson have a point for virtually all traits except intelligence.

Intelligence, since it is needed to discover its own existence, occupies a special position among all traits. As intelligence gradually increases, it is to be expected that a few individuals with sufficient intelligence to do psychometrics, and discover the concept of *g* will emerge. When the distribution of intelligence has risen to the point where some individuals investigate intelligence, others individuals will be of much lower intelligence. At this time, only a small fraction of the population is likely to have sufficient intelligence to do psychometrics and to understand the concept of *g*. Thus, the finding of a wide range in intelligence, a variable that contributes to fitness, is perhaps not as surprising as it might appear at first.

Thus, Patterson's (1995, p. 196) argument "The problem which Herrnstein, Jensen, and all hereditarian psychologists face them, from the discipline on which they have so heavily drawn, is that IQ scores are too hereditary if they are to sustain the claim that these tests have any significance beyond the test center and classroom." This would be a much more powerful argument if applied to any trait other than intelligence.

The same argument can be extended to populations. Because of the wide geographical area *Homo sapiens* occupies, its long generations, and the obstacles to gene flow across tribes, there are likely to be differences in the intelligence of different populations at any time. When some populations have reached the point of having the technology to explore the world, they are likely to discover that other populations have not yet developed to this point, and they can be expected to conclude that there are differences between the world's various populations in intelligence.

Conclusions

Intelligence is a genetically influenced variable that is affected by many different genes. It has also plausibly been subject to unidirectional selection. Calculations indicate that for a small hunter-gatherer population that genes would move at a rate that was slow relative to the time since modern human symbolic culture emerged. This makes it very likely that geographical differences in the frequencies of various intelligence related genes will exist. With unidirectional selection in a polygenetic system, it is meaningful to talk about some areas being more advanced than others (since there is a direction in which all are moving). Centrally located populations will normally be more advanced. Genes will move faster in thinly populated areas. The thinly populated areas can serve as genetic freeways that carry genes rapidly across continents.

Given the very slow progress of genes with a stable population structure, occasional waves of advance caused by new technologies or the movement of populations can greatly accelerate the movement of mutations. The spread of agriculture was one such event. The coming of the horse and the ship were other similar events. The horse caused the steppes of Central Asia to become a genetic highway that transported favorable mutations from China, Europe, India, and the Middle East to other areas. This caused these areas to reach high levels of intelligence before other areas. Areas without the horse, such as sub-Saharan Africa, would have lagged.

Peripheral areas such as Australia and the Americas probably also lagged due to isolation from the large populations of Eurasia.

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The G Factor - The Book and the Controversy

by Prof. Edward Miller

from The Journal of Social, Political, and Economic Studies, (Summer 1996)

In late March a book by Christopher Brand titled *The G Factor: General Intelligence and its implications*. appeared in UK bookstores. It was published by Wiley UK. On April 17, the New York office announced in an unprecedented action "After careful consideration of the statements made recently by author Christopher Brand (as reported in the British press), as well as some of the views presented in his work.. , we have decided to withdraw the book from publication. (Wiley) does not want to support these views by disseminating them or be associated with a book that makes assertions that we find repellant." (Holden, 1996). It is very unusual for a publisher to break a contract with an author and announce that the reason for the this action is to prevent the dissemination of certain views. The question naturally arises as to what are the views whose dissemination they wish to prevent, and what is the evidence for these views? While Wiley has not been specific as to just what views that were trying to prevent the dissemination of, one presumes they have to do with racial differences in intelligence and the implications for economics and educational policy. Wiley announced (McMillen 1996) that they acted because of "deep ethical beliefs", but what these were was not revealed. One suspects they were that racial differences and eugenics should not be discussed, but that is merely a guess.

Fortunately, the author of this review article had seen the Wiley prepublication publicity planned for the jacket (available at <http://laboratory.psy.ed.ac.uk/DOCS/crb/new.htm>) and decided to review the book. He had obtained a copy, and started this review when the book was withdrawn. The fact that this book was withdrawn in an announced attempt to prevent the dissemination of certain ideas will modify somewhat the nature of this review. It will be longer than the usual review so that the reader will have the opportunity to know what Brand had to say. Also references will be provided so that the reader will be able to find the sources for what Brand claimed.

Incidentally, this will serve to make clear that the views that Wiley was trying to avoid disseminating were based on well established science. Brands book is not primarily about racial differences or eugenics (the major policy recommendations relate to educational policy). But since much of the controversy has dealt with these issues, and it appears that Wiley's goal was to prevent dissemination of Brand's views of these issues, a disproportionate part of this review will be devoted to these topics. This will serve both to inform the reader of Brand's views on these issues, and to frustrate Wiley's attempt to prevent dissemination of certain ideas.

There are several interesting features of Wiley's actions. In many countries there has been concern about domination of the economy by companies headquartered abroad. This concern has been especially strong with regard to national culture, and the industries that directly affect it including publishing, motion pictures, broadcasting, etc. Usually a multinational firm tries to leave the impression that key decisions affecting the culture or economy are made in the country affected.

Wiley's decision is unusual in that it was announced in New York and made in the name of the chief executive, Mr. Ellis, even though the major effect was to cause the withdrawal of a book from British bookstores and to hurt a Scottish author. The very short period of time between the start of publicity in Britain and the decision of Wiley's New York executives to withdraw the book make it very unlikely that anyone in New York had read the book in detail. An interesting aspect of the Brand case, is that the Scottish Nationalist party, which is understood to believe that Scotland should not be ruled in all details from London, might have been expected to

take the lead in preventing Scotland from being ruled from America. However, their Leader, Mr Alex Salmond denounced Edinburgh and supported the decision of Wiley headquarters in New York to break their contract with Brand, and to remove his book from Scotland's booksellers. That he made this decision shows the power of the taboo against discussing racial differences in intelligence. The author's royalties from books on intelligence will go not to Scotland, but to those Americans, such as Herrnstein and Murray, Jensen, Seligman, Rushton, Itzkoff (etc.) whose books say much the same as Brands, except with more emphasis on race. Nor will a UK publisher get the revenue, or UK workers get the printing jobs. That even a Scottish nationalist would support a NY decision to withdraw a book by a Scottish author from Scotland's bookstores shows the strength of the taboo against discussing certain topics. As is well known, there is an organized effort in the US and elsewhere to suppress any discussion of racial differences in intelligence (Pearson, 1991).

In response to the furor caused by Brand, there were student protests on his campus, apparently left wing students who were opposed to the discussion of racial differences. They claimed that they were made uncomfortable by lectures in which racial and sexual differences were discussed. These complaints led to the announcement of an investigation of Mr. Brands teaching by his University. One suspects this was a result of political correctness since Brand had been lecturing at Edinburgh since 1970, apparently without significant complaints. Thus the investigation on its face appears an effort to penalize him for expressing controversial views. The withdrawal of the book by Wiley meant that debate about Brand's view had to proceed with many having actual access to the book in which his view were expressed. It is partially to remedy this problem that this summary of the book is provided.

What is really in this Controversial Book? Actually, *The g Factor: General Intelligence and its implications* provides a good readable discussion of what is known about intelligence that differs in most aspects little from what other authors have said (Herrnstein and Murray, 1994, Jensen, 1980, 1981, Seligman, 1992, Rushton, 1995, Itzkoff, 1994, etc). The title of *The g Factor* arises from the psychometricians' use of the letter g to stand for the general factor which can be extracted from performance on a battery of mental performance chapters. The book is relatively short consisting of only four chapters and a postscript.

The first chapter is devoted to discussing what is intelligence, and what do psychometricians mean by g. After a brief history of concepts of intelligence and of mental testing, the remarkable fact is presented that performance on most mental tests are correlated. Someone who does well on one test tends to do well on other tests. While this is sometimes described as an unsurprising finding, it is pointed out that the normal expectation is that skills are learned, and time spent on one activity comes at the expense of time spent on other activities. Thus, it is indeed surprising that there is a positive correlation between different skills. It is pointed out how many of the psychologists working on mental abilities have desired to make their mark by identifying a new mental ability that was uncorrelated with the already known. abilities. So far such attempts have failed. For instance, the Piagetian abilities that children master in the course of development were shown to be abilities well correlated with intelligence.

There is a good discussion of how such a variety of abilities, all of which are correlated, implies the existence of a common factor, g, which is useful for predicting school and job performance. The book deals nicely with the complaint that tests measure only "academic intelligence" pointing out that they provide the only way of predicting success in most occupations, with even noted critics admitting that lawyers, engineers, and chemists virtually never have IQs below 100. Even the military, an organization that is not usually considered to value academic aptitude, still finds tests useful. In one of many great lines in the book (p. 32), "By definition, it cannot be 'narrow academic skills' that boost efficiency ratings and remuneration across a wide range of jobs types: grasping capitalist employers and crime-busting police chiefs will surely not be taken in for long by mere scholasticism." The theory that g is merely measuring the social class of the parents is refuted by pointing out that parental social class has only a modest correlation with the education attainments of the children by their

early twenties. (p.35). White (1982) reviewed 100 studies in the US and estimated the correlation at about .22. As Brand puts it "Evidently parental socioeconomic status (SES) today scarcely correlates with, so simply cannot be influencing, such a crucial variable as educational attainment in young adults." This chapter has a useful discussion of the lower performance of certain groups (notably blacks) on tests, drawing the useful distinction between the claim that the tests are a valid measure of ability but that some environmental disadvantage of the group (such as racial prejudice) has actually harmed the group, and the claim that the tests are actually biased against members of the group. Evidence is presented that measures of intelligence predict school performance equally well in both groups. (Scarr-Salapetek, 1971, 1972). Likewise, for adults IQ tests correlated just as well with job performance in all racial groups. "Actually, the tests slightly over-predict scholastic and workplace performance by blacks and are to that extent unfair to whites and Asians in competition for the same positions." (p. 37). The author of this review has provided in this journal a simple graphical exposition of why this is (Miller, 1994).

The possibility that minority children lack motivation for test taking is disproved by the fact that "black children do perfectly well at laboratory tests that are not correlated with g-such as drawing a straight line, threading beads, and recalling past events."(p. 37). It is pointed out that when particular items are identified by sociologists and educationists as appearing 'culturally unfair' to minorities, black children actually do a little better on these tests (often requiring memory and learning) than on items selected on the basis of being unbiased (and often requiring g).(p. 38). It is pointed out that at every age and every level of family income, that black children are no worse at the Weschler vocabulary than they are at block design (Roberts 1971, but yet vocabulary is probably more culturally influenced than the ability to copy block designs.

The second chapter of this short book deals with the bases for IQ differences, and in particular, the extent to which they are genetic. There is a nice simple discussion of factor analysis (with a numerical example for the centroid method). There is then a fascinating discussion of the biological correlates of intelligence. While there is a brief mention of Jensen's decision time work, the emphasis is on the inspection time work which Brand himself pioneered (Brand & Deary, 1982). In inspection time experiments the subject is shown (often with a tachiscope) for a fraction of a second two markedly different lines (2.5 inches versus three inches) and asked to say which is longer.

The minimum time the subject must see the lines to determine which is longer is determined. This task is simple, and has no obvious relationship to intelligence. However, it does correlate with intelligence (as Brand discovered), and the author argues (p. 73) that overall "results are compatible with an estimate that the true IT/IQ r in the full population (including representative proportions of the young, the elderly and the retarded) would be $-.75$." The minus sign here indicates that that the time required to tell which line is shorter is less for the more intelligent.

Somehow it appears that the brains of the more intelligent function differently than the brains of the less intelligent, even on simple tasks where there is no learning involved. This is of course consistent with there being a genetic basis for many differences in intelligence. The third chapter deals with issues of nature and nurture. There is now very little dispute among the experts that a substantial fraction of intelligence differences between people is for genetic reasons. Perhaps the most striking evidence comes from studies of identical twins raised apart. Their IQ's correlated .78. The other twin studies are reviewed, with mention of the study that involved the largest number of monozygotic twins (Lynn & Hattori, 1990) where the correlation for 543 pairs of monozygotic twins was .78 and for 161 pairs of dizygotic twins .49. Like other authors that have reviewed the evidence, Brand finds there is evidence for substantial heritability.

Brand does violate the taboo of drawing (even if weakly) the eugenic implications the role of genetics in intelligence. He contrasts the implications that might be drawn from a belief in "environmentalism" with those

that might result from a belief that genes play a role. He points out that (p. 12) "If children of the future are to receive maximum intellectual and education levels and to be more employable, there would need to be fewer homes where parent and caretakers were un-stimulating, drug-addicted, neglectful, and themselves of low IQ—even assuming large environmental origins of g". He states, drawing on the Reed and Reed (1965) collected data on 80,000 descendants of the grandparents of 289 state colony patients having IQ's <70 (and without epilepsy), that the overall rate of retardation would have been reduced by 50% if handicapped people themselves had not had children, even though only 88 of the 289 patients were diagnosed as having retardation of definitely genetic origins. What is happening here is that those suffering from retardation of unknown origin are having children who are themselves retarded, which suggests a genetic cause for most such cases. He points out that (p. 120), "A eugenic policy focused on IQ must be attractive to any would-be improvement of human happiness—whether hereditarian or environmentalist." To those that fear that acknowledgement of genetic influence might lead to state efforts to limit reproduction of certain individuals, he points out (p. 121) that "Acceptance of others' rights is what protects everyone from state manipulation of any kind; and such acceptance follows perhaps a little more easily from a belief in biologically based individual agency than from an environmentalism that stresses the power of society to shape and even 'construct' the individual."

The final chapter of the book is titled "Intelligence in Society", and sets out the policy implications. Since this section appears to be what got the book withdrawn, it will be summarized here, even though doing so risks making the book appear more social in nature than it really is. The discussion opens with a discussion of Jensen's 1969 article on the failure of Head Start, and his controversial suggestion that the problem was with the lower genetic IQ of black children. Brand comments that (p. 131) "Most educational experts agreed with Jensen and Eysenck that black IQ levels were low (for whatever reason) and that this deficiency helped to explain poor education records and later tendencies to crime and promiscuity. To recognize this deficiency (if not to publicize it) had remained tolerable while the racial differences in IQ seemed changeable." He suggested that recognizing this became intolerable once the failure of early childhood intervention to correct the problem had become apparent, and been documented by Jensen.

Brand points out (p. 134) how three events have blocked off lines of dignified retreat for crusaders against the 'Jensenist heresy.' First evidence was produced that the tests were as fair and valid for black children as for anyone else (Jensen 1980). Secondly it had become apparent in America that low IQ's were not generally characteristic of racial and ethnic groups that had experienced discrimination, as shown by Jews and Orientals in America. In Britain, Brand reports that Pakistani immigrants suffer from prejudice and maintain a language, religion, and moral code that distance them from their British hosts yet, their children have always tested as being of normal intelligence once they have learned English, and they slightly outperform English children educationally by mid-adolescence (Brand 1987c). Brand points out that "almost the full Afro-American deficit, of some 15 IQ points, could be detected in children as young as three years, born to black mothers who were themselves college educated, married and had no pregnancy complication or health problem. (Monte & Fagan, 1988). Medically and socially matched, these young black children had a mean IQ of 91 and the white children tested at 104." As he points out, the matching for socioeconomic status and the use of college educated mothers eliminated most of the environmental theories for racial differences that are commonly proposed. At age three most children have not been in school, or been exposed to much of the world outside of their own family and community (i.e. any societal racial discrimination should not have affected them).

Brand describes the experiments with adoption of black children into the homes of white middle-class homes. This yielded (p. 135), "the usual 8 point IQ gain plus some narrowing of the gap between black and white adoptees at age 7; but by age 17, the black youngsters lagged the white by the usual 12-15 IQ points (Weinburg, Scarr & Waldman, 1992; Lynn, 1994)". He points out (p. 136) evidence against the theory that blacks suffer from being in a white society is provided by the failure of blacks to perform conspicuously better

in any of the countries or North American cities run by blacks themselves--indeed, they usually performed much worse.

Having dealt with the controversial topic of black white differences (this rather mild discussion was apparently the reason that caused Wiley to withdraw the book), the discussion moves on to the practical importance of intelligence. It is pointed out that IQ at age five correlated strongly ($r=.50$) with educational achievements when they were 15 (Brand did not provide the reference for this in the book, but he privately supplied, Yule, Gold, & Busch, 1981). It is pointed out that many studies in which IQ is unimportant are ones where restriction of range is important. IQ has seldom correlated better than .30 with college grades, but this is because of the restriction of admission to the better students, and because students sort themselves by ability into course of different difficulties.

The mental tests that correlated best among themselves (i.e. indexing g) turned out to be the main predictors of occupational success and income (Hunter & Hunter, 1984; Schmidt, Ones & Hunter, 1992). A statement in the text that upward inter-generational mobility is strongly predicted only by IQ is expanded on in a footnote where he points out that difference scores are particularly unreliable (since they are affected by the unreliability from both of the variables that contribute to them). Waller's (1971) finding of a correlation of .29 between father-son IQ differences and father-son socioeconomic differences would imply a "true" correlation of around .50. As an illustration of the ability of IQ to explain outcomes better than socioeconomic status, several results from the Bell Curve (Herrenstein & Murray, 1994) relating to the probability of dropping out of high school, probability of white males being unemployed for a month, and probability of white out-of-wedlock mothers going on welfare) are graphed.

The discussion then moves to the implications for educational policy of individual differences in intelligence. Brand points out how many students are forced to study material in school they have already mastered. In Montreal, 45% of the children know 60% of the school curriculum (in French and math) before the year work begins (Gagne, 1986), while in a study of 160 gifted English school children, 60% were found to be doing classwork at a level more than four years below their actual attainments (Painter, 1976). He points out that the top 10% of 7 1/2 year-old-children are higher in g than the bottom 10% of 15 1/2-year-olds (Raven 1989). Brand thus pushes the apparently common sense idea that students should be grouped in accordance with ability.

Brand points out that although modern educational ideology talks about allowing children to progress at their own speed within mixed ability classes, that as a practical matter this cannot be done since the teacher cannot teach at two levels at the same time. The argument that smaller classes would permit better mixed ability teaching is countered by pointing out that classes of even six would still have virtually the full range of abilities, and that empirical studies regularly show that educational outcomes are unrelated to class size (Walsh, 1995).

He proposes that the problem of matching children's mental ages be solved by putting the brighter eight-year-olds with the nine-year-olds, and the slower eight-year-olds with the seven-year-olds. The usual objection to this is that grade advanced children would not have sufficient maturity, emotional age, or moral development to associate with older children. Brand has dug up an impressive list of studies (p. 162) that the mental age predicts these better than chronological age. On 11 out of 12 measures of social and emotional adjustment, gifted children in Grade 3 were found to be more advanced than average children in Grade 6 (Lehman & Erdwins, 1981). He claims that there is no sound evidence that grade advancement will yield either social or emotional maladjustment (Silverman, 1989, and Feldhusen, 1991).

Brand proposes that children and parents should be free to pick scholastic programs that suit their abilities. It is

surprising that a book with such a mild conclusion should have caused such a furor. How unconventional are the views expressed by Brand, and summarized above. Actually, they differ little from those of other specialists who study intelligence. A survey sent to 1020 experts (Snyderman and Rothman, 1988) showed that there were three times as many who thought the racial differences were both genetic and environmental, as thought it was solely environmental.

Amazing, there a few other fields where admitting that one believes what is the mainstream wisdom will get one so soundly condemned.

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A Critique of Gould by Jensen

Robert Sheaffer posted this paper by Arthur Jensen to the newsgroup sci.psychology on 16 Feb 1995. Scheaffer added the following introductory remark.

The following is a review of Gould's *Mismeasure of Man*, in which Dr. Arthur Jensen replies to Gould's severe criticism of him in the book. Of course, uncritical admirers of Gould will insist that Jensen is a "racist," and hence anything he says can conveniently and automatically be ignored. But those who are open-minded and want to give both sides a fair hearing should read Jensen's reply without any preconceived ideas, and ask themselves: Is this man **really** the terrible bigot and fool that Gould makes him out to be? Or is he a serious scholar who has been the victim of a campaign to paint him as a scoundrel because his findings contradict certain political ideologies? Jensen's reply has, until now, only been seen by a miniscule fraction of those who have read Gould's *Mismeasure*. Here is a chance for the "other side" to state its case.

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THE DEBUNKING OF SCIENTIFIC FOSSILS AND STRAW PERSONS

The Mismeasure of Man

New York: W. W. Norton, 1981

by Stephen Jay Gould

Arthur R. Jensen

[ARTHUR R. JENSEN is Professor of Educational Psychology, University of California, Berkeley, CA 94720. His areas of specialization are Differential Psychology, Psychometrics and Behavioral Genetics. Recent publications include *Straight Talk about Mental Tests*, New York: The Free Press, 1981. Dr. Jensen received his B.A. at UC, Berkeley and his Ph.D. at

Columbia University.]

This book concerns the biasing influence that social ideology may have on purportedly objective science--the behavioral and brain sciences especially and psychometrics in particular. Ironically, the book itself serves as a patent example of its own thesis.

Stephen Jay Gould is a paleontologist at Harvard's Museum of Comparative Zoology and offers a course at Harvard entitled, "Biology as a Social Weapon." Apparently the course covers much the same content as does the present book. Having had some personal cause for interest in ideologically motivated attacks on biologically oriented behavioral scientists, I first took notice of Gould when he played a prominent role in a group called Science for the People and in that group's attack on the theories of Harvard zoologist Edward O. Wilson, a leader in the development of sociobiology (*BioSciences*, March, 1976, Vol. 26, No. 3). I wonder if Gould's present book is an example of his idea of "science for the people"? It is written in a popular and sometimes engagingly entertaining style; it is filled with "human interest," and with vivid accounts of eminent but self deluding, cheating, and foolish scientific figures of the past--a kind of intellectual morality play of wrong doing (or wrong thinking); it focuses on accounts of subsequent "recanting" by the "big names" in the history of mental testing, those wittingly or unwittingly self-deceived bad guys in this "tale of zealotry." ("Goddard recants," "Brigham recants," "Terman recants," "Spearman recanted," etc. Indeed, whenever a scientist alters his view on some point over a 20 year period, or later places a different emphasis on some particular fact, Gould insistently refers to his "recanting.") Naive readers might develop a gut-level dislike for the many reactionary elitist schemers exposed in Gould's book. But then readers will be gratefully relieved to see all the villains toppled to ignominy for their egregious fallacies.

Most of the reviews of the book which I have seen thus far in the popular press already bear out half of my prediction: Gould's book will receive much more uncritically favorable and sentimentally sympathetic reviews from the professional literati in the popular press (it has won official acclaim from the National Book Critics' Award) than it will receive in the technical journals at the hands of qualified professionals in the relevant fields. (I have not yet seen any reviews in the technical journals.) Gould's debunking expedition offers many an easy target to critics with an intimate knowledge of the topics discussed. Before taking aim at those specific points, which I feel most competent to criticize, I shall first try to abstract the main message of Gould's book from his own perspective.

Overview of Gould's Thesis

Underlying all the varied detail of Gould's exposition is a philosophy of science, or rather a sociology of science, which emphasizes the notion that scientific endeavor generally is not so much a search for objective knowledge as it is a sociopolitical activity, reflecting the social context and value systems within which individual scientists do their work. According to this

view, socially conditioned presuppositions or prior prejudices about the nature of society force even "good scientists" to produce theories and conclusions that inevitably confirm their own social prejudices and lend to them additional support in the guise of scientific truth.

This charge of a social, value-laden science undoubtedly contains an element of truth. In recent years, however, we recognize this charge as the keystone of the Marxist interpretation of the history of science. In this view, science is motivated to promote that form of socioeconomic class structure that most favors the privileged elite, reinforcing its position of political and economic power. By the same token, any unwitting biases of scientists are deemed most prone to line up against the socially underprivileged and economically disadvantaged classes. Presumably, such ideological science only pretends to test its hypotheses in the idealized, objective manner we learned about in our introductory high school and college science courses. In this view, scientists actually, begin with prejudices, then frame them as theories, and create only the illusion of demonstrating the validity of their hypotheses. The conclusions are, to use Gould's apt phrase, "advocacy masquerading as objectivity." This end is accomplished through "biased selection" --of data, of methods of analysis, and of various possible interpretations of evidence--such that the final outcome will confirm whatever dogma originally motivated the supposedly objective search for the truth. This theme is the foundation of the seven chapters of Gould's opus.

According to Gould, the inescapable dialectic of science and social ideology is best illustrated in the behavioral sciences through the agency of several long-lived and closely intertwined key beliefs.

Biological determinism is the poison root. This notion (a "lie," according to Gould) is manifested in the attempt to discover, or failing that, to invent, some biological (i.e. nature-given) justification for "ranking people" (or groups of people) according to their "inborn worth." Biological determinism is a "theory of limits," which assumes that the current status of different races and social groups is an inevitable consequence of their "innate worth." By Gould's definition, biological determinism essentially is the attempt to make nature an accomplice in the crime of political and socioeconomic inequality. It arises in a political context to serve the group in power. Its perpetuation depends on the myth that science is an objective enterprise, whereas science actually mirrors the predominantly religious or political ideology of its time. Biological determinists in the human sciences are claimed to be identified with politically conservative and reactionary ideologies. The centrality of this theme for Gould is shown by his claim that he was inspired to write the book "because biological determinism is rising in popularity again, as it always does in times of political retrenchment." Hence, the book is primarily an attack on "biological determinism" as it applies to human mental ability.

By what means can the "lie" of biological determinism be sustained by the establishment? How can this reactionary hope, belief, or claim (viz., that "worth" can be assigned to individuals or groups) be implemented, while still maintaining the appearance of objective, scientific

sanction?

Intelligence, or rather the concept that intelligence can be measured as a "single quantity," is the answer. Gould portrays this concept as utterly fallacious. Indeed, Gould characterizes the attempt of psychometrists, past and present, at the quantification of intelligence, as the attempt to assign "all individuals to their proper status in a single series." But how can this scheme be made scientifically believable? How can we justify scientifically the determination of people's "worth" on the basis of assigning a single number or score on an "intelligence test" to each person?

Reification of the concept of intelligence is the answer, according to Gould. By converting an abstract concept, intelligence, into a "unitary thing," a "single substance," an "object" (all Gould's words) that occupies space inside the brain, the pioneer psychometrists established the essential rationale for ranking individuals, social classes, and races on a unidimensional scale of "worth." The awful fallacy of reifying intelligence (or Spearman's *g*, the general factor common to a large number of cognitive abilities) becomes a central theme in Gould's account. The conscious or unconscious motive behind this reification of general mental ability, or intelligence, is that such reification presumably is demanded by the dogma of biological determinism. The "quantification" and the reification of intelligence facilitate and justify the distinctions and divisions between people, which political and social orders dictate, according to this view.

The whole nefarious, fallacious enterprise is best exemplified by two fields of research: "craniometry," in the 19th century, and its replacement in the 20th century, by "psychometry," particularly intelligence testing. Scorn heaped on the early craniometrists, particularly those concerned with the relationship of brain size to intelligence, should transfer to modern psychometrists who are interested in the measurement and nature of intelligence. "We live in a more subtle century, but the basic arguments never seem to change. . . The crudities of the cranial index have given way to the complexity of intelligence testing" (p.143). To Gould, the old-fashioned craniometric science and modern psychometric science are as parent and offspring. The purpose of both is essentially the same: to prove that the innate construction of people is reflected in their present social and economic roles. Both the outmoded craniometry of the 19th century and the mental tests of the present day have stemmed from the false belief that intelligence is a "thing" in the head, according to the measurement of which all persons, social classes, and races can be ranked in "mental worth"--a term that Gould uses repeatedly (in addition to "innate worth" and "ultimate worth") as a substitute for "intelligence" or "IQ," as if to imply that all these terms are entirely synonymous in present-day psychometrics.

The essential message of Gould's book is epitomized in his own words: "This book. . . is about the abstraction of intelligence as a single entity, its location within the brain, its quantification as one number for each individual, and the use of these numbers to rank people in a single series of worthiness, invariably to find that oppressed and disadvantaged groups--races, classes,

or sexes--are innately inferior and deserve their status" (pp. 24-25).

General Criticisms

Before addressing specific points in each of the chapters, I shall first mention what seems to me to be general deficiencies pervading the work as a whole.

Sociology of Science

First, I think Gould exaggerates the threat of the sociology of science as an obstacle to objective science. Errors, blind spots, and biases on the part of individual scientists have always existed in every scientific field. Yet over the course of time there indisputably has been scientific progress and the growth of objective knowledge in every sphere of scientific endeavor. Of course, the theory that science cannot be objective because it cannot escape the context of social values is itself not exempt from the same generalization. If this theme is overplayed, as it is by Gould, it places its advocate in a position not unlike that of the Greek philosopher's paradox of the Cretan who declared, "All Cretans always lie. " If the statement is true, it must be untrue, and hence need not be taken seriously.

Fortunately, progress in scientific knowledge is distilled out of the endeavors of the many individually imperfect scientists who investigate the same phenomenon. The enterprise succeeds in its aim of objectivity, in the long run, despite the subjective biases of individual scientists and despite the influence of social context as portrayed by the Marxist sociology of science. Mendel's theory is accepted and Lysenko's is rejected (even by the Soviet ideologues who once promoted it), not because one scientist was necessarily a better man than the other, but because there is indeed a reality out there in the realm of phenomena, a reality in terms of which theories can be criticized and tested by innumerable other scientists, albeit each with his or her own individual biases or blind spots, each scrutinizing and testing the others formulations. One chief virtue of science is that, in order to succeed, its practitioners need not be saints or paragons of detached objectivity. When many individual scientists--ordinary men and women with specialized technical competencies--are all able to think as they please and do their research unfettered by collectivist or totalitarian constraints, science is a self-correcting process.

In any case, the Marxist sociology of science, whatever general truth it may contain, cannot exempt the critic from a detailed analysis of any particular theory or empirical claim, showing precisely how it fails as objective science, or why it should be rejected and replaced by some competing formulation or body of evidence. That has always been the normal procedure of science, and we know that it works. At one point, Gould covers himself by claiming this general view: "As a practicing scientist, I share the credo of my colleagues: I believe that a factual reality exists and that science, though often in an obtuse and erratic manner, can learn about it" (p. 22). But Gould would want us to believe that the behavioral sciences are especially unlucky

in this regard. That could be. Still, the situation would be by no means hopeless. The behavioral sciences, including differential psychology, psychometrics, and behavioral genetics, surely can be, and for the most part, normal science.

Unfortunately, Gould's book itself contributes heavily to promoting the ideological encumbrance of these fields. This is a pity. The field is faced with many real problems, which call for objective analysis and research, yet in my judgment Gould's book contributes absolutely nothing to this effort. The *Mismeasure of Man* attempts to debunk, and, as far as I can make out, attempts to do nothing else. Of course, debunking can be a useful activity in the scientific enterprise, provided the specific objects of attack are real and present issues. The disappointment of this book is its failure really to debunk anything currently regarded as important by scientists in the relevant fields. Because of Gould's peculiar selection of flawed scientific relics as targets for attack, it is hard for me to imagine that this work will impress any but those unfamiliar with current research in these fields, despite the author's evident intelligence and keen literary style. I believe he has succeeded brilliantly in obfuscating all the important open questions that actually concern today's scientists. Instead of taking on the real issues of contemporary research in these fields, paleontologist Gould tilts at a museum collection of scientific fossils and at many a straw person of his own making.

Focus on the Past

The fossil nature of practically all the objects of Gould's expose is suggested by the fact that, although the book is not properly a history of mental testing, most of the key references are amazingly old. Present-day workers in these fields will have nothing to worry about! Few, if any, will consider it worth the bother to dig into such ancient tomes to check the validity of Gould's interpretations. Of all the book's references, a full 27 percent precede 1900. Another 44 percent fall between 1900 and 1950 (60 percent of those are before 1925); and only 29 percent are more recent than 1950. From the total literature spanning more than a century, the few "bad apples" have been hand-picked most aptly to serve Gould's purpose. Yet what relevance to current issues in mental testing are the inadequacies and errors of early anatomical studies by Samuel Morton (who died in 1851) or Paul Broca (who died in 1880) concerning racial variation in cranial capacity (to which Gould devotes the better part of two chapters): Who now wishes to resurrect Lombroso's (1836-1909) theory of physical criminal types; Cyril Burt's 1909 report (his very first publication) of social class differences in intelligence; Goddard's account of the Kallikak family (1912) and the long since discredited theory of "feeble-mindedness" as a simple Mendelian character; Terman's pronouncements in 1916 about eugenic measures to reduce the incidence of mental retardation; the primitive 1917 army mental tests; or the U.S. Congress's 1924 Immigration Restriction Act, which cited the 1917 army test data? These antiquated topics, which occupy most of Gould's book, can in no way serve to undermine or discredit current work in physical anthropology, psychometrics, differential psychology, behavioral genetics, and sociobiology. Readers expecting to find a forthright critique of the present status of issues and controversies in these fields are in for disappointment. The closest

thing they will find to criticism of contemporary mental testing is the insinuation of its guilt through remote historic lineage.

In distant retrospect, the early history of every science often looks bizarre in some respects. Why should we expect the behavioral and brain sciences to be the great exception? Should we ridicule the Early astronomers for claiming that the Earth is the center of the universe, or the early anatomists for claiming that the heart is the seat of emotion? Why should anyone demand of psychology that it be hatched fully mature and perfect at its very beginnings?

Gould devotes the larger part of a chapter to a minutely detailed and damning critique of the first group mental test ever devised. Yet everyone today would surely agree that the first army tests fall far short of current standards of test theory and construction. Psychometric theory and technology have come a long way since 1917. Indeed, a half-century after the first group tests were used in the army, the office of the Surgeon General estimated that the use of modern tests for selection in the armed forces saves the nation more than \$140 million a year in the cost of training recruits after basic training--not a trivial utility for psychology's most practical and most indisputably successful invention.

Gould's exclusive critical focus on forebears (and the worst examples, at that) is much like trying to condemn the modern automobile by merely pointing out the faults of the Model T. An entire chapter is devoted to Lombroso and his school of criminal anthropology! As an undergraduate nearly 40 years ago, I recall learning that Lombroso's theory of "criminal types," all bearing distinctive anatomical stigmata of their moral pathology, had long since been discredited. Although it makes for amusing reading to see Lombroso's old theories once again so enthusiastically panned, Gould's motive in reviewing them seems clear. The Lombroso critique serves merely as a long prelude to the short epilogue of this chapter, which disparages modern research on the suspected relationship of the XYY chromosomal anomaly to violent and criminal behavior, research Gould refers to as a "reincarnation" of Lombroso. Gould writes, "The signs of innate criminality are no longer sought in stigmata of gross anatomy, but in twentieth-century criteria: genes and the fine structure of the brain" (p. 143). Apparently any research on the biological correlates of human behavior is deemed anathema by Gould.

Distorted and Misleading Information

It would be practically impossible for me to assess the accuracy of representation or the carefulness of interpretation of all the specific targets of Gould's multifarious critique. Frankly, I feel little inclination to comb the many archaic references on which most of Gould's debunking depends, especially because they are no longer of any concern to modern researchers in these fields. Who in 1982 is interested in debating precisely what was said by whom about the phlogiston theory in its heyday? I am able, however, to testify concerning a number of contemporary references, which are already at my fingertips.

In his references to my own work, Gould includes at least nine citations that involve more than just an expression of Gould's opinion; in these citations Gould purportedly paraphrases my views. Yet in eight of the nine cases, Gould's representation of these views is false, misleading, or grossly caricatured. Nonspecialists could have no way of knowing any of this without reading the cited sources. While any author can occasionally make an inadvertent mistake in paraphrasing another, it appears Gould's paraphrases are consistently slanted to serve his own message. Through hyperbole and caricature he converts real issues into straw persons, which can be easily disproved.

Some examples are:

1. Gould states that the normal variation within a population is a different biological phenomenon from the variation in average values between populations. (Actually, this may be or may not be true for any given trait; it is an empirical question.) Failure to recognize this distinction, Gould claims, is an error that occurs "over and over again" and is the "basis of Arthur Jensen's fallacy in asserting that average differences in IQ between American whites and blacks are largely inherited" (p. 127). The fact is, of course, that I have never "asserted" (Webster: "assert implies stating confidently without need for proof or regard for evidence") that IQ differences between any races are largely inherited. Nor have I ever claimed that the well-established heritability of individual differences in IQ within races proves the heritability of differences between races. To quote directly from some earlier writing (Jensen, 1970): "Group racial and social class differences are first of all individual differences [i.e., they are the statistical averages of individual measurements], but the causes of the group differences may not be the same as of the individual differences" (p.154, italics added). Whether the causes are or are not the same for any particular trait for any particular groups is a question open to rival hypotheses and empirical investigation. Such has always been my position, a position spelled out most recently in Chapter 6 of my book *Straight Talk About Mental Tests* (Jensen, 1981a).

2. Gould claims that "Jensen recognizes that his hereditarian theory of IQ depends upon the validity of [Spearman's] q " (p.265), and that "Jensen has demonstrated by example that a reified Spearman's g is still the only promising justification for hereditarian theories of mean differences in IQ among human groups" (p. 320). This is simply nonsense. Neither I nor anyone else in behavioral genetics has ever claimed or believed any such thing. If the total variance in any battery of tests were treated by different methods of factor analysis, some methods yielding a large g , or general factor, and other methods spreading the variance over a number of group factors (or "primary mental abilities"), the total proportion of genetic variance in all of the factors would not be altered in the

least. This is because heritability (i.e., the proportion of the total variance that is attributable to genetic factors) does not depend at all on the factor structure of the variables in question. (Similarly, either methodological preference whether for concentrating variance on g and possibly a few large group factors, or for distributing it more or less evenly over a larger number of "primaries," should not alter in the least the total amount of variance associated with race.) All this is not to say, however, that it would be scientifically trivial or theoretically uninteresting should it turn out that certain methods of factor analysis yield some factors that show high heritability while the remaining factors show virtually zero heritability. We already know that the g factor shows substantial heritability; and recently, Lloyd Humphreys (1981), in interpreting his analysis of twin and cross-twin correlations on the Project TALENT tests (a large battery of diverse aptitude and scholastic achievement tests), stated that "the genetic contribution to these cognitive tests, whatever its amount, was restricted to the general factor" (p. 99). This interpretation, if generally substantiated, would bear out Spearman's (1927) conjecture that g is the only heritable cognitive factor, while the various group factors (independent of g) arise from the investment of g in different contents of learning, as influenced by opportunity, interest, and reward. My own hunch is that a few of the largest and most stable group factors (e. g., verbal, numerical, memory, and spatial) as well as some components of musical and artistic aptitude, will probably also show some heritable variation independent of g.

3. Gould claims that I have defended a g, or general intelligence, which is "reified as a measurable object" (p.318). Yet in the same chapter from which Gould is supposedly paraphrasing my views (Jensen, 1980a), I stated unequivocally that "[I]ntelligence is not an entity, but a theoretical construct... The g factor may also be termed a theoretical construct, which is intended to explain an observable phenomenon, namely, the positive intercorrelation among all mental tests, regardless of their apparently great variety" (p. 249).

4. In a table in *Bias in Mental Testing* (Jensen, 1980a, p. 220) showing a factor analysis of 16 tests, the g factor is shown in the first column, and the first four rotated varimax principal components (including the first component, which, unrotated, was the g of the first column) are shown in the next four columns. I make it absolutely clear that the rotated factors g was extracted. (Note the table headings, the arrangement of the table, the presentation of the communalities in the last column, and the explanation in the text.) Nonetheless, Gould offers the following misleading account: "[H]e [Jensen] records the same thing twice for each test--g as a first principal component and the same information dispersed among simple structure axes giving some tests a total information of more than 100 percent. Since big g's appear in the same chart with large loadings on simple-structure axes, one might be falsely led to infer that g remains large even in

simple-structure solutions" (p. 319). A thorough twist! And a logical error to boot, because no factor which could properly be interpreted as *g* could possibly emerge from a simple structure, or varimax rotation, the express purpose of such rotation being to disperse and submerge the general factor in the rotated primaries!

5. In discussing Burt's (1940) now discredited and probably fictitious data on the IQs of identical twins reared apart, [note: Burt appears to have been the victim of a politically-motivated slander, and the case against him is now collapsing: see *Nature* 340:439 (10 Aug. 1989); 352:120 (11 July, 1991); 354:97 (14 Nov. 1991)], Gould writes, "It is scarcely surprising that Arthur Jensen used Sir Cyril's figures as the most important datum in his notorious article (1969) on supposedly inherited and ineradicable differences in intelligence between whites and blacks in America" (p. 235). In fact, I have never used twin differences in any aspect of the discussion of racial differences, except when pointing out the errors in this approach by a number of psychologists who had held that monozygotic twin differences in IQ (because they are entirely nongenetic) favor a strictly environmental interpretation of the observed race differences in IQ (Jensen, 1973, p. 161).

6. Gould claims that "[h]e [Jensen] believes that all God's creatures can be ordered on a *g* scale from amoebae at the bottom (p. 175 [Jensen, 1980a]) to extraterrestrial intelligences at the top (p. 248 [ibidem])" (p. 317). This will be recognized by any fair-minded person who has read my *Bias in Mental Testing* (Jensen, 1980a) as a gross travesty of one section in that book, namely, a section summarizing some of the main research findings on animal intelligence (pp. 175-182). (Note that I have referred to "extraterrestrial beings" 74 pages later in another context, and not as being at the "top" of anything!) To top it off, Gould then refers to his own travesty as "Jensen's caricature of evolution"! Disbelieving readers may find it instructive to compare Jensen's (1980a) Chapter 6 with Gould's flagrant caricature of its content, with "reified" *g* as an "object" ascending on a "unilinear" evolutionary hierarchy of all existing species from amoebae to extraterrestrial beings! Such a picture is, of course, utter nonsense, but it is Gould's nonsense, not Jensen's.

7. Gould writes: "Arthur Jensen (1980a, pp. 361-362) supports the value of IQ as a measure of innate intelligence by claiming that the correlation between brain size and IQ is about 0.30. He doesn't doubt that the correlation is meaningful and that 'there has been a direct causal effect, through natural selection in the course of human evolution, between intelligence and brain size'" (p. 108). What Gould does not indicate is that this hypothesis was never represented as my own claim. Rather, it was explicitly and accurately represented as a paraphrase of the most up-

to-date and technically sophisticated review of the evidence on human brain size and intelligence available, by Leigh Van Valen (1974), a biologist at the University of Chicago. Why then does Gould not cite Van Valen's thorough and scholarly treatment of this topic? Instead he makes it appear that Van Valen's conclusions are simply Jensen's claim. Moreover, the Jensen chapter has merely summarized the literature on the various physical correlates of IQ (including brain size, brain-evoked potentials, stature, basal metabolic rate, obesity, and myopia). Contrary to Gould's paraphrase, it has offered no opinions at all about the meaning of these correlations with respect to the "innateness of IQ."

8. In a recent publication (Jensen, 1980a, p. 535), I have presented new evidence for Spearman's (1927, p. 379) observation that the magnitudes of the average white-black differences on various tests are positively related to the g factor loadings of the tests, a point in my review that is germane to factor-analytic criteria of test bias. Gould writes, "Jensen also uses g more specifically to buttress his claim that the average difference in IQ between whites and blacks records an innate deficiency of intelligence among blacks" (p. 319). Nowhere in the cited reference (Jensen, 1980a) (or in any other publication) have I ever erred by inferring genetic causation of racial differences from the g factor or any other use of factor analysis, and nowhere have I "claimed" an "innate deficiency" of intelligence in blacks. My position on this question is clearly spelled out in my most recent book: "The plain fact is that at present there exists no scientifically satisfactory explanation for the differences between the IQ distributions in the black and white populations. The only genuine consensus among well-informed scientists on this topic is that the cause of the difference remains an open question" (Jensen, 1981a, p. 213). Apparently Gould does not tolerate so openly agnostic a stance on scientific questions which have important social implications.

Despite Gould's poor batting average for accuracy and fairness in his paraphrasing of references to Jensen, may we hope that he has perhaps afforded more impartial treatment to all the other targets of his critique:

Brain Size and Intelligence

Gould devotes two chapters to race and sex differences in brain size, and to the relationship between brain size and intelligence. Again, though practically all the studies cited are more than 100 years old, Gould meticulously points out their errors and biases.

Brain size is of some scientific interest in relation to intelligence, presumably because the great increase of brain size in the course of human evolution resulted primarily from the selective advantage of the greater capacity for complex learning and problem-solving ability conferred by

a larger cerebrum. It seems a natural question whether variation in brain size (or any other features of the brain) is related to differences in psychometric intelligence among contemporary humans. After dismissing the pioneer studies, Gould is wholly uninformative about current thought and evidence on this topic.

Van Valen's (1974) well-known review and analysis of the evidence on brain size and intelligence is conspicuous by its absence from Gould's book. Although Van Valen's article is an excellent review, it unfortunately overlooks one crucial point. That point concerns any correlation between different traits, especially correlations between physical and psychological traits, namely, whether the obtained correlation represents a functional (i. e., causal) relationship between the variables or merely an adventitious genetic correlation resulting from the common assortment of the genes for the two traits as a consequence of cross-assortative mating for the two traits (e.g., if blue-eyed persons mated only with curly-haired persons, blue eyes and curly hair could become correlated in the population, even though there is no intrinsic connection between these characteristics). No study of the correlation between brain size and intelligence, to my knowledge, has applied the necessary methodology based on sibling data (explicated by Jensen, 1980b) to rule out mere assortative genetic correlation between these variables. Until this is done, the theoretical significance of the correlation (whatever its magnitude may be) between brain size and IQ remains unknown. Any correlation existing between families but not within families (i.e., not among siblings), is scientifically empty as far as advancing our understanding of the nature of intelligence. Evidence suggests that such is the case for the population correlation (of about 0.25) between height and IQ. This does not mean, however, that one must automatically partial height out of the brain-size x IQ correlation, as Gould advocates. Theoretical interpretation of the intercorrelations among brain size, body size, and IQ is possible only by means of genetical analysis (e.g., analysis employing data on between and within-family correlations) combined with path analysis.

The essence of Gould's message in his two chapters on race and sex differences in brain size, and the relationship between brain size and intelligence is that craniometry served no valid scientific purpose, but was merely an expression of the prejudicial self-interest of comfortable white males. But to complain that an investigator's conjectures stem from personal prejudices (or any other source) is, of course, scientifically irrelevant. The importance of scientific conjecture arises solely from its relation to some theory and its testability, or susceptibility to empirical refutation. Gould's disparagement of craniometry, however, seems to serve merely as a prelude to the more currently important topic of intelligence testing. Gould writes: "Cranio-metric arguments lost much of their luster in our century, as determinists switched their allegiance to intelligence testing--a more "direct" path to the same invalid goal of ranking groups by mental worth--and as scientists exposed the prejudiced nonsense that dominated most literature on form and size of the head" (p. 108). Not surprisingly, in the last two-thirds of his book, Gould launches a concerted attack on the "prejudiced nonsense" of intelligence testing.

Gould's first broadside against intelligence testing is an 88-page chapter entitled "The Hereditarian Theory of IQ." The most remarkable feature of this chapter is that it does not present even a hint of the kinds of evidence, or the quantitative-genetic methods applied thereto, which have caused many reasonable and fair-minded contemporary scientists to conclude that genetic factors are substantially involved in individual differences in IQ. The reader is told nothing at all about the polygenetic basis of individual differences or about the logic of quantitative genetics and its application to the various kinship correlations on which the "Hereditarian Theory of IQ" is based. Naive readers will be completely misled as to the true nature of the current popular controversy over the inheritance of mental ability.

Instead, they will read about the first (1905) Binet tests and about how Binet's early American followers, Goddard and Terman, allegedly corrupted Binet's intentions by reifying the IQ as an inborn "thing" in order that it might better serve as an instrument of social and racial discrimination. About 30 percent of the chapter is taken up with a fine-grained critique of the psychometrically primitive 1917 army tests and the purported influence of the test results on U.S. immigration policy in the 1920s, which, we are told, was promoted by "Teutonic supremacists."

The Cox (1926), and Terman estimates of the IQs of eminent historical figures, based on biographical accounts of their childhood accomplishments, are also unfairly ridiculed by Gould in this chapter. For example, Gould points out that such major acknowledged geniuses as Copernicus and Faraday were assigned lower IQs than some figures of lesser eminence (e.g., Galton, with an estimated childhood IQ of 200). But Cox's monograph makes it very clear that the estimated IQs are the minimum values that could be estimated on the basis of the available evidence of early-life accomplishments. (Shakespeare, for example, was completely omitted because of inadequate biographical evidence.) In fact, no attempt was made in the monograph itself to rank-order individual historic geniuses by their estimated IQs. The aim of the Terman and Cox study was simply to see if there might be evidence for a higher average level of mental precocity among the world's famous geniuses--and there clearly is. All the inherent methodological limitations of the study are fully acknowledged in Cox's (1926) thoroughly careful monograph. Gould supplies no new information by his sarcastic embellishment.

By this point in Gould's book, the weight of vituperative excess will no doubt have caused even technically naive but intelligent readers to begin to question whether the most influential figures in the early history of mental testing could really have been so utterly foolish and wicked as Gould makes them appear. The fact that Galton, Goddard, Yerkes, Terman, Brigham, Thorndike, and other pioneers of psychometrics may have expressed poorly founded and occasionally dogmatic hereditarian opinions concerning intelligence at a time before any adequately developed methodology or suitable evidence was available for the genetical analysis of mental test data, cannot legitimately be construed as an indictment of all subsequent research in this area. Yet Gould never mentions any of the considerable body of recent work in

behavioral genetics. One wonders, does he avoid it perhaps because the technical issues cannot be so simplistically and entertainingly lampooned as the early efforts of the pioneer mental testers?

The "hereditarian fallacy" (p. 156) is described by Gould as (1) the implication that "heritable" is equated with "inevitable," and (2) the assumption that if genetic factors explain a certain proportion of the individual differences variance within population groups, they explain the same proportion of the mean differences between various populations, such as racial groups. This "hereditarian fallacy" constitutes a strawperson if ever there was one. I cannot recall a single living "hereditarian" who has ever expressed either of these beliefs, though I know of many who have noted their inherent logical fallacy. I myself, dubbed by Gould as "America's best-known hereditarian," have attempted in several publications from 1969 to 1982 to explicate the illogic of trying to prove the heritability of mean differences between groups from a knowledge of the heritability of individual differences within groups. I have also attempted over the years to dispel the common, but unwarranted, assumption that heritability necessarily implies the inevitability or immutability of human differences. (A nontechnical treatment of these matters is found in Jensen [1981a, pp. 108-115 and 226-232].) Certainly these issues are more complex than Gould's brief treatment even begins to suggest; they require considerably more explication than he presents, for even the barest understanding of them. Correctly understood, moreover, these are not matters of theoretical contention among behavioral geneticists.

The "Reification" of General Intelligence

In a chapter entitled "The Real Error of Cyril Burt," we come to the core of Gould's argument: his perceived necessity for demolishing the concept of *g*, Spearman's symbol for the common factor in all cognitive tests. Because *g* constitutes by far the largest part of the variance in all "intelligence" tests, it is often termed the "general intelligence" factor. Gould gives a good nonmathematical explanation of the workings of factor analysis (and principal components analysis) and how *g* and other factors are "extracted" from a correlation matrix. After this quite acceptable explanation, Gould begins his battle.

According to Gould, *g* is the quintessential abomination. He writes, "The chimerical nature of *g* is the rotten core of Jensen's edifice, and of the entire hereditarian school" (p. 320). What especially makes *g* so awful, according to Gould, is the error of reification. This, he claims, is the "real error" of Cyril Burt, and also of Charles Spearman, the inventor of factor analysis and the discoverer of *g*. These pioneers in the field are charged with the crime reifying *g*. Yet the kind of outlandish verbal reification for which they stand accused is, in fact, absolutely contrary to any expression about *g* that one can find in the works of Spearman or Burt, or, indeed, in any of the serious literature of factor analysis and intelligence. The *g* factor as supposedly conceived by Spearman and Burt is variously referred to by Gould as "ineluctable, innate general intelligence," "innate essence of intelligence," a "hard, quantifiable thing," a "quantifiable

fundamental particle," a "single, scalable, fundamental 'thing' residing in the human brain," "a 'thing' in the most direct, material sense," and so forth. This language is all completely misleading. More importantly, it is Gould's language, and not the language of those he chooses to discuss.

Reified or not, the factor g itself and factor analysis in general have nothing to do with "innateness" or the nature-nurture question. Whether individual differences (or group differences) in g factor scores have a heritable component or not is an entirely separate question, which cannot be answered by any methods of factor analysis, but only by the methods of quantitative genetic analysis.

Moreover, to anyone who has carefully read the major works of Burt and Spearman on factor analysis, the claim that they (or any other experts in this field) are guilty of reifying g will be recognized as another straw person, an unqualified hoax. Few psychologists, or few scientists in any field for that matter, have been as sophisticated in the philosophy of science as Spearman and Burt. The most sophisticated discussion of the whole issue of the meaning of factors to be found in the entire literature is Burt's(1940) chapter entitled "The Metaphysical Status of Mental Factors." In it, Burt states" [t]o speak of factors of the mind as if they existed in the same way as, but in addition to, the physical organs and tissues of the body and their properties, is assuredly indefensible and misleading" (p. 218). Burt's entire discussion is well worth reading even today. Surely no one before or since has ever presented a more intellectually profound and subtle consideration of the nature and interpretation of the factors derived by the factor analysis of mental tests.

As will be equally apparent to anyone reading Spearman's (1927) great work, *The Abilities of Man*, he too was fully aware of the reification issue. Certainly Spearman makes it extremely clear that he intended his hypothesis of g as "mental energy" as just that--a hypothesis, a theoretical attempt to account for the phenomenon which the g factor highlights and quantifies, namely, positive manifold (i.e., the presence of all positive intercorrelations among all diverse tests of cognitive abilities, when the tests are given to representative samples of the general population). Spearman made no apologies for hypothesizing causal mechanisms to explain g. Quite the contrary:

[Psychology] is a science in its own right, and can no more fulfill this mission without hypotheses than a man can run properly with his legs tied in a sack. What would physics do without its electrons, its ether, or its heat, none of which are, or perhaps even can be, directly perceived? Indeed, there is no necessity for believing that such entities really exist at all. (p. 128)

In fact, what Gould has mistaken for "reification" is neither more nor less than the common practice in every science of hypothesizing explanatory models or theories to account for the observed relationships within a given domain. Well-known examples include the heliocentric

theory of planetary motion, the Bohr atom, the electromagnetic field, the kinetic theory of gases, gravitation, quarks, Mendelian genes, mass, velocity, and so forth. None of these constructs exists as a palpable entity occupying physical space. The g factor, and theories attempting to explain g in terms of models independent of factor analysis itself, are essentially no different from the other constructs of science listed above. Nor is there any good reason that hypothetical models attempting to account for g should necessarily exclude all considerations of neural or biochemical processes. All such theoretical speculations about the nature of g, whether offered by Spearman, Burt, Jensen, or anyone else, have involved hypothetical processes or system concepts, presumably going on in the brain (where else?). But these theories have never depicted g as some "single," "ineluctable," "hard," "object," of the sort characterized by Gould. Would Gould then deny psychology the common right of every science to the use of hypothetical constructs or any theoretical speculation concerning causal explanations of its observable phenomena? He writes, "My complaint lies with the practice of assuming that the mere existence of a factor, in itself, provides a license for causal speculation" (p.268). But haven't all sciences always exercised free license for theoretical speculation about the causes of the observable phenomena in their domains? Of course they have.

The crucial question, which is summarized by the existence of the g factor is this: In respect to what processes or mechanisms is it that persons who perform well on anyone test, in general, also perform well on many other tests, even on tests that are highly dissimilar in content and sensory and motor modalities? The concept of intelligence depends not on the fact that people can be ranked by this test or that, but rather on the fact that, whatever the test, so long as it is cognitive in the broadest sense, a positive correlation emerges between the ranks for any two tests. If an IQ test were just a rag-bag collection of cognitive tasks that did not all measure a common factor, there could be no positive manifold. Scientists today are trying to understand the causes of positive manifold, and this is what the present g theory is all about. Gould offers no alternative ideas to account for all these well-established observations. His mission in this area appears entirely nihilistic.

L. L. Thurstone, the leading American psychometrician and factor analyst, might have emerged as a minor hero in Gould's drama, were it not for his alleged tendencies toward factor reification and his avowed hereditarian stance. At least Thurstone's factors were a number of "primary mental abilities" and not the unholy g. Gould dubs Thurstone "the exterminating angel of Spearman's g" (p. 296). With the development of multiple-factor analysis, Thurstone had chosen to rotate the factor axes in such a way as to maximize the variance of the loadings on all the latent common factors in a correlation matrix (a criterion he termed "simple structure"), a procedure that yields a number of first-order factors, or "primary mental abilities" (e.g., verbal, numerical, spatial, memory). According to Gould, "the hegemony of g was broken. >From the midst of an economic depression that reduced many of its intellectual elite to poverty, an America with egalitarian ideals (however rarely practiced) challenged Britain's traditional equation of social class with innate worth. Spearman's g had been rotated away, and general mental worth evaporated with it" (p. 304). Actually, the g variance was not at all "exterminated"

by Thurstone's method, but merely' dispersed among the primary factors. Later, Thurstone himself realized that he could obtain a closer fit to his criterion of simple structure by allowing the factor axes to be obliquely rotated (i.e., correlated). Thurstone also came to realize that subsequent factor analysis of the intercorrelations among the oblique primary factors would recover the g factor, essentially the same g as arrived at by the Spearman and Burt methods of g extraction!

In discussing Thurstone's primary abilities, Gould states, "Some children are good at some things, others excel in different and independent qualities of mind" (p. 304). If Gould is talking about cognitive abilities, this statement is deceptively plausible (because we know that everyone is better at certain things than at others). In the context of his discussion of factor analysis, however, it is essentially wrong and misleading. If Gould's statement were wholly true, a second-order g factor could not emerge from any large collection of diverse mental tests. Yet, in fact, a second-order g always appears for all cognitive tests obtained in any representative sample of the general population. (This is equivalent to saying that the overall ability differences between individuals are generally greater than the average differences that exist between various abilities within individuals). Moreover, g factor scores, when g is extracted either as a first principal factor (Spearman-Burt) or as a hierarchical, second-order factor (Thurstone), are generally very highly correlated with one another, usually above .95 in most factor analyses of the same battery of tests in the same subject sample. (Congruence coefficients between the g factor loadings in the two methods are usually even higher.) True, the hierarchical, second-order g carries somewhat less variance than the g extracted as a first principal factor, but Gould greatly exaggerates this point in his effort to belittle the second-order g. In 10 factor analyses of Wechsler subtest batteries that I have examined, in which g has been extracted both as a first principal component and as a hierarchical second-order factor (using the Schmid-Leiman, 1957, transformation), the second-order g accounts for about 80 percent of the variance accounted for by the first principal component. The second-order g also accounts for about two-thirds of the total common-factor variance in the test battery, whereas the three primary factors (verbal, performance, and memory), after g is removed, account for about one-third of the variance. It would be a rare, even freakish, collection of cognitive tests that would yield a g which, by any proper method of extraction, would be subordinate to any of the rotated first-order factors.

No knowledgeable factor analyst of either the Spearmanian or Thurstonian school disputes the fact that the various methods or models of factor analysis are all mathematically equivalent in their ability to "account for" the matrix of intercorrelations. Other, nonmathematical considerations must determine preferences for one method over another. Although the number of factors that can be extracted from a correlation matrix is necessarily limited by the number of variables, there is virtually an infinite number of possible rotations of the factor axes, and hence an infinity of different possible factors. There is no rule in science that restricts the particular factors that any investigator may choose to focus upon. Some factor solutions make much more sense, psychologically, than others, however, and psychologists may suspect that there is more

"pay dirt" in certain factors than there is in others.

In this respect, factor solutions that yield a g, and the g factor itself, have generally been of greatest interest throughout the history of psychometry. More scientific curiosity has been stirred up by g than by any other products of factor analysis, and for a number of good reasons. Here is a baker's dozen:

1. The fundamental reason is the phenomenon of positive manifold: that is, the existence of positive correlations between all tests in the cognitive domain, over a wide range of diversity, regardless of the content or other surface characteristics of the tests. The g factor represents this salient fact of nature better than any other single factor or any combination of multiple orthogonal factors (which disperse the g variance and thus artificially create the misleading impression that there are zero correlations among the several clusters of tests defining group factors or primary abilities).

2. Taken together, the g factor plus smaller group factors (primary abilities independent of g) best represent the fact that, on average, overall differences between individuals in the population are greater than the differences among various abilities within individuals. Multiple orthogonal factors, without g, would not lead us to this (empirically established) expectation.

3. Certain tests (generally those involving greater complexity of mental manipulation) are consistently more g-loaded than others, when analyzed in different batteries of various tests. Other tests (usually involving sensory-motor skills or rote-learning ability) have rather consistently weak g loadings under these conditions.

4. Essentially the same g emerges from collections of tests which are superficially quite different. Unlike all other factors, g is not tied to any particular type of item content or acquired cognitive skill. (This is the basis for Spearman's principal of "the indifference of the indicator" of g.)

5. It has proved impossible to construct a test to measure any of Thurstone's Primary Mental Abilities (or any other first-order cognitive factors) that does not also measure g. That is to say, scores on "factor pure" tests (i.e., tests designed to measure some factor other than g) always measure g in addition to whatever primary ability factor they were specially devised to measure. The g variance in tests of primary mental abilities is, moreover, generally greater than the variance attributable to the primaries. It has proved possible, however, to devise tests that measure g and little or nothing else.

6. The g factor reflects more of the variance in informal, common-sense estimates of differences in people's intelligence by parents, teachers, employers, and peers than any other factor that can be extracted from psychometric tests. In addition, g discriminates more accurately than any other factor between average persons and persons diagnosed as mentally retarded by independent, nontest criteria, and between average persons and those who are recognized as intellectually gifted on the basis of their accomplishments.

7. There is no general factor of human learning ability that is different from, or independent of, the g of psychometric tests. However, there is much more "specificity" (i.e., variance not related to any common factors) in learning tasks than in most psychometric tests composed of numerous items.

8. Although g may not be equally valued in all cultures, individual differences in g-related abilities are easily recognized, even by persons in societies that differ tremendously from Western or industrial civilizations.

9. In its practical ability to forecast the success of individuals in school and college, in armed forces training programs, in employment in business and industry, and so forth, g carries far more predictive weight than measures of any other factor or any other combination of factors independent of g (see Jensen, 1981 b). This fact also means that many "real life" kinds of performance, and not just psychometric tests, are substantially g-loaded.

10. Humphreys (1981) has pointed out that even where mental tests are not implicated, the naturally occurring educational and occupational selection in our society involves g more than any other measurable psychological variables. Each "sieve" in the educational and occupational ladders selects on g, and this is as true in those communist countries in which mental ability tests are officially forbidden as it is in the United States. For this and for many other reasons, Humphreys [sic] aptly refers to g as "The primary mental ability."

11. Although more evidence is still needed for a firm conclusion, what evidence we have suggests that g has the highest degree of heritability of any component of variance in psychometric tests (e.g., Humphreys, 1981). The group factors (and specificity) show little or no heritability apart from the heritability of g.

12. The genetic phenomenon of inbreeding depression (i.e., the diminution of a metric character in the offspring of genetically related parents, such as siblings or cousins) is indicative of genetic dominance of the genes enhancing the trait in question. Large-scale data on the offspring of cousin matings show that the degree of inbreeding depression observed on 11 diverse subtests of the Wechsler

Intelligence Scale for children is positively and significantly correlated with the subtests' g loadings (Jensen, in press). (This is equally true whether g is extracted as a first principal factor or as a hierarchical second-order factor.)

13. The g factor (and g factor scores) are substantially correlated with measures of the speed of information processing in simple laboratory tasks, such as simple and choice reaction times, which bear no resemblance to the usual psychometric tests from which the g factor is extracted (Jensen, 1980c). Recently it has been found, in a sample of 100 university students, that speed of information processing, as measured by reaction-time techniques, is highly correlated with the g factor of the Wechsler Adult Intelligence Scale, and that no additional component of variance in the 12 WAIS subtests (including the verbal, performance, and memory factors) shows a significant correlation with the reaction time measures (Vernon, 1981). Vernon writes, "Given the strength of the association between mental speed and g, it is further argued that these attributes are largely the same: a person's intelligence can be defined in terms of the speed and efficiency with which he can execute a number of basic cognitive operations" (p. 83). At an even more basic level, there is now considerable evidence that g is correlated with the amplitude, latency, and complexity of average devoked potentials in the brain, as measured by means of EEG apparatus and electrodes attached to the scalp (e.g., Eysenck, 1981; Jensen, Schafer, & Crinella, 1981). If such important findings are examples of what Gould wishes to suppress by his railing at the "reification" of g, then I will shout three cheers for "reification"!

But Gould does not tell his readers about any of these interesting things on the present scene. The fact is that psychologists have been witnessing in recent years a great revival of interest and research on Spearman's g, research aimed mainly at discovering the basic processes--cognitive and neurophysiological--that will eventually explain the nature of g. That the theory of general intelligence is presently thriving is evidenced in many current publications, such as the relatively new journal *Intelligence* and the recent multiauthored books edited by Friedman, Das, and O'Conner (1981) Sternberg (1982), and Eysenck (1982). These publications are recommended for readers who want factual, up-to-date information about research on intelligence and mental testing.

Gould's book, on the other hand, is so repetitiously cluttered by doctrinaire disparagement that it can hardly provide any real enlightenment regarding mental measurement. Although Gould's book will be warmly embraced (along with Leon Kamin's, 1974, *The Science and Politics of IQ*) by the dwindling band of genetic egalitarians and neo-Lysenkoists, it is hard to see that this book makes any scientific contribution or serves to inform the general public in any responsible way about the truly important issues in mental testing today.

Editor's Note. Dr. Gould has been invited to respond to this article for publication in a

subsequent issue of CER.

[The next few issues contain no reply from Gould. If he ever replied, I have been unable to find it.]

--note added by David Scheaffer

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Reflections on Stephen Jay Gould's "The Mismeasure of Man"

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On its publication in 1981, *The Mismeasure of Man* (Gould, 1981) stirred in the reading public an interest and a clamor almost equal to that evoked by the recent appearance of Herrnstein and Murray's (1994) *The Bell Curve*. Although it never made the *New York Times* best-seller list (as did the latter, for 14 weeks), it was much discussed among intellectual dilettantes, and it received a National Book Critics Circle award, as well as, perhaps unexpectedly, the 1983 Outstanding Book Award from the American Educational Research Association.

The biologist Bernard Davis (1983; see also Gould, 1984; Davis, 1984) called attention to the fact that reviews in the popular and literary press, such as *The New York Times Book Review*, *The New Yorker*, and *The New York Review of Books*, were almost universally effusive in their approbation, whereas most reviews in scientific journals, such as *Science* (Samelson, 1982), *Nature*, and *Science '82*, tended to be critical on a number of counts. Davis cited Jensen's (1982) review in *Contemporary Education Review* as "the most extensive scientific analysis," but mentioned, as an exception, a generally laudatory review by Morrison that appeared in *Scientific American* because that journal's editorial staff had "long seen the study of the genetics of intelligence as a threat to social justice" (Davis, 1983, p. 45).

To Davis' list of generally critical reviews in scientific journals, I would add those by Spuhler (1982) in *Contemporary Psychology*, and by Jones (1983) and Humphreys (1983) in *Applied Psychological Measurement* (the latter appearing also in the *American Journal of Psychology*, 1983).

Despite these critical reviews, however, *The Mismeasure of Man* continues to be cited frequently in the social science literature, usually, but not always, with what can be taken as agreement and approval. In the annual volumes of the *Social Science Citation Index*, the numbers of citations listed for the years 1982 to 1993 were 18 (1982), 32 (1983), 32 (1984), 49 (1985), 46 (1986), 48 (1987, including a citation of a German translation), 61 (1988), 51 (1989), 53 (1990), 62 (1991), 58 (1992), and 56 (1993). It is evident that Gould's book has had a powerful influence on public and professional thinking about mental testing.

I do not wish to imply that all of this influence was unfortunate or negative. Gould's research on the history of craniometry is interesting and possibly valuable for historians of science. His account of the history of mental testing, however, may be regarded as badly biased, and crafted in such a way as to prejudice the general public and even some scientists against almost any research concerning human cognitive abilities. In this account, he indicts mental testing not only as racially motivated, at least in its beginnings, but more importantly, as ethically and scientifically flawed because it "reifies" the IQ as a single number that places a value on a test result. This despite Gould's admonition that:

"The misuse of mental tests is not inherent in the idea of testing itself. It arises primarily from two fallacies, eagerly (so it seems) endorsed by those who wish to use tests for the maintenance of social ranks and distinctions: reification and hereditarianism (p. 155)."

Gould's influence has come to the fore again in his recent review (Gould, 1994) of Herrnstein and Murray's (1994) *The Bell Curve*-a book that takes much stock in the "g" factor of intelligence postulated by Spearman (1904, 1927) and many others. Although I do not necessarily ally myself with any of Herrnstein and Murray's analyses, views, and interpretations about the role of g in American life, I feel it is important to correct the impressions about g and factor analysis that Gould put forth in his review. There he wrote:

"Nothing in 'The Bell Curve' angered me more than the authors' failure to supply any justification for their central claim, the sine qua non of their entire argument: that the number known as g, the celebrated 'general factor' of intelligence ... captures a real property in the head. Murray and Herrnstein simply declare that the issue has been decided, as in this passage from their *New Republic* article: 'Among the experts, it is by now beyond much technical dispute that there is such a thing as a general factor of cognitive ability on which human beings differ and that this general factor is measured reasonably well by a variety of standardized tests, best of all by I.Q. tests designed for that purpose.' Such a statement represents extraordinary obfuscation, achievable only if one takes 'expert' to mean 'that group of psychometricians working in the tradition of g and its avatar I.Q.' The authors even admit that there are no major schools of psychometric interpretation and that only one supports their view of g and I.Q.

But this issue cannot be decided, or even understood, without discussing the key and only rationale that has maintained g since Spearman invented it: factor analysis. The fact that Herrnstein and Murray barely mention the factor-analytic argument forms a central indictment of 'The Bell Curve' and is an illustration of its vacuousness. How can the authors base an eight-hundred page book on a claim for the reality of I.Q. as measuring a genuine, and largely genetic, general cognitive ability-and then hardly discuss, either pro or con, the theoretical basis for their certainty? (p. 143)"

Following that are a couple of paragraphs in which Gould tries to explain what "lay readers" might need to know about factor analysis. He briefly repeats some of the same ideas that he

offered in his 1981 book: how Spearman identified g with an axis placed through the middle of a batch of vectors, and how Thurstone made g "disappear" by rotating the axes, "giving rise to a theory of multiple intelligences (verbal, mathematical, spatial, etc.), with no overarching g." He continues: "In this perspective, g cannot have inherent reality, for it emerges in one form of mathematical representation for correlations among tests and disappears (or greatly attenuates) in other forms, which are entirely equivalent in amount of information explained" (p. 144).

It is indeed odd that Gould continues to place the burden of his critique on factor analysis, the nature and purpose of which, I believe, he still fails to understand. Even if factor analysis had never been invented, we would nonetheless have IQ tests and many other kinds of aptitude tests measuring various cognitive abilities. And there would still be "experts" dealing with the construction, analysis, and interpretation of these tests, and behavioral geneticists (Plomin & McClearn, 1993) concerned with the heritability of the traits measured by these tests.

It is my intention here to focus on the defense of factor analysis as an effective and scientifically justifiable method for the study of individual differences in cognitive abilities and other psychological attributes, as well as to make any necessary statements concerning the adequate measurement of such attributes. This is partly because the available scientific reviews of *The Mismeasure of Man* gave little attention to Gould's treatment of factor analysis. If some of my arguments sound pedantic, it is only because a pedant (as is implied by the derivation of the term) seeks to teach.

GOULD'S BASIC PREMISES

First, a general remark: I must raise cautions about two of Gould's basic assumptions: (a) that the "urge to classify and rank people is strong" and somehow wrong, and (b) that scientists cannot be objective, because their findings reflect their surrounding culture and "the unconscious and very personal prejudices of the scientists themselves" (quoted from the dust jacket).

Regarding the first assumption, why it is wrong to attempt to classify and rank people is never made completely clear by Gould. Certainly classification is a basic technique in all of science, including Gould's paleobiology. One can hardly make progress in science without determining the attributes of the things being studied; in many cases, assigning attributes to things "ranks" them, for example, by length, weight, mass, frequency, and so on. In psychology and social science, we can assign attributes to people with respect to age, social status, tolerance, and so on, to a whole host of entities that can be "measured." Indeed, measurement is one of the basic techniques of science. It may become obnoxious, in some circumstances, when the measurements are assigned "values" of greater or lesser "worthiness" in terms of ethics, social justice, or social/emotional attitudes. This is what Gould appears to mean when he objects to "ranking." However, Gould confuses this kind of ranking with pure measurement. Some may object to the imputation of ordinal, interval, or even ratio scaling in the assessment of ability,

but in my view there are adequate logical and scientific reasons to introduce such scaling, for example in the use of Rasch scaling (Rasch, 1960) of items (or tasks) in ability and achievement tests, or the more complex models developed by Lord and Novick (1968) for what they call Item Response Theory (IRT). These models take account of the fact that for any ability, it is possible to find tasks that differ with respect to the number of people in any population that are able to perform them correctly, and that there are definite (albeit probabilistic) mathematical relations between such tasks that can be described in terms of a quantitative scale of ability. To be more specific, IRT makes mathematical sense of the fact that, if the tasks on a scale are graded in difficulty, a person at a certain level of ability tends to be able to perform successfully all tasks up to a certain point, after which the person tends to fail the remaining tasks on the scale.

Concerning the second assumption, the idea that scientists cannot be objective is an old one, pursued by many philosophers and sociologists of science (e.g., Krasner & Houts, 1994; McMullin, 1988; Scheffler, 1967). Obviously there are many factors in scientists' selection of the things and issues they choose to study, and perhaps their personal wants, interests, and prejudices constitute some of these factors. However, having made those choices, there is no reason why they cannot be objective in their studies, in reporting independently verifiable observations, analyses, and findings. In particular, I object to Gould's tendency to visit the alleged sins of early investigators on present day investigators. If Goddard, Brigham, and others once tended to view various human races as relatively superior or inferior in intelligence and therefore relatively worthy or unworthy, this does not mean that present-day investigators, like Jensen (1980) or Rushton (1995), are necessarily guilty of such views. In fact, from my personal acquaintance with Jensen and his publications, I can attest that he does not view the African race (if one accepts that it is a race) as in any way less worthy than other so-called races. Indeed, Jensen has been more interested and active than most other scientists in trying to work through the problem of how to interpret, and what to do about, the acknowledged lower mean measured intelligence of Blacks. This fact has been almost totally ignored by most of Jensen's activist critics.

Gould's remarks about scientific objectivity have at least impelled me to consider my own motivations, over my career, in the study of cognitive abilities. At a time when I was searching for a topic suitable for a doctoral dissertation pertinent to my main interest in the psychology of language, I became intrigued with Thurstone's (1938) finding of several so-called "primary" abilities, "verbal ability" and "word fluency," that seemed relevant to the study of language behaviors and possibly indicative of important mental processes. It did not occur to me that mental testing might be relevant to racial differences; in fact, I was unconvinced, by data available at the time, that any important racial differences in mental abilities existed, particularly because my linguistic studies had persuaded me that all races and ethnic groups possess complex linguistic systems that betokened higher states of mental processes among at least substantial portions of every population that was able to acquire and use these systems. Whether factor analysis has in fact led, or will lead, to better understanding of mental processes

remains to be seen, but in any event my motivation to study and use factor analysis has always been associated with the scientific investigation of cognitive processes. I cannot believe that such motivation is in any way associated with pernicious social attitudes.

GOULD ON FACTOR ANALYSIS

Gould (1981) starts his Chapter Six, "The real error of Cyril Burt: Factor analysis and the reification of intelligence," with a consideration of "The case of Sir Cyril Burt," recounting the "twice-told tale" of Burt's alleged transgressions of scientific proprieties. For present purposes, this whole story is irrelevant. For a discussion of factor analysis it does not matter whether Burt claimed to have invented it (he did not) or fabricated data on twins raised apart, although the debate as to whether he did still goes on (Fletcher, 1991; Hearnshaw, 1979; Joynson, 1989; Samelson, 1992, 1995). It is interesting, though, that Gould makes Burt a whipping boy for Spearman; if any blame attaches to the supposed reification of intelligence, it should be awarded to Spearman (as Gould eventually recognizes, pp. 250ff).

Gould goes on to discuss factor analysis, which he says "is, to put it bluntly, a bitch" (p. 238). (Some have called his exposition masterful, but I would call it masterful only in the way one might use that word to describe the performance of a magician in persuading an audience to believe in an illusory phenomenon.) Gould cites his own use of factor analysis, early in his career:

"I was taught the technique as though it had developed from first principles using pure logic. In fact, virtually all its procedures arose as justifications for particular theories of intelligence. . . . [T]hough its mathematical basis is unassailable, its persistent use as a device for learning about the physical structure of intellect has been mired in deep conceptual errors from the start. 'The principal error, in fact, has involved a major theme of this book: reification-in this case, the notion that such a nebulous, socially defined concept as intelligence might be identified as a 'thing' with a locus in the brain and a definite degree of heritability-and that it might be measured as a single number, thus permitting a unilinear ranking of people according to the amount of it they possess. By identifying a mathematical factor axis with a concept of "general intelligence," Spearman and Burt provided a theoretical justification for the unilinear scale that Binet had proposed as a rough empirical guide. (Gould, 1981, pp. 238-239)

This statement calls for comment. First, it is not the case that "virtually all [factor-analytic] procedures arose as justifications for particular theories of intelligence." Perhaps Spearman regarded his (at the time very primitive) procedures as justifying his own theory of intelligence, but the many procedures of factor analysis that have been developed over the subsequent years cannot be regarded as "justifications" of any particular theory of intelligence. Rather, factor-analytic procedures can be regarded as devices to assist in developing different theories of intelligence and choosing among them. Consider, for example, the different theories of intelligence developed by Thurstone (1938), Guilford (1967), and Cattell (1971). I regard

myself as one of these theorists (Carroll, 1994) in the field of intelligence, or "cognitive abilities," as I prefer to say, but I do not regard factor analysis as such a justification for my theory. Justification of my theory comes, at least in part, from the manner in which I use factor analysis and other techniques (such as IRT) to analyze and interpret data.

Second, the wording "the physical structure of intelligence" is strange and misleading. Factor analysts study what they call the structure of intelligence, but they do not regard it as a physical thing in any way. It is simply a statement of the varieties of cognitive ability and the degree to which they occur or do not occur together, or subsume each other; often the structure of intelligence is diagrammed as a hierarchical tree structure. It is no more a physical thing than the structures that biologists employ to depict the evolutionary relations of biological species.

Third, and most importantly, factor analysis implies no "deep conceptual error" of "reification." One can agree with Gould that factors are not properly regarded as "things" or physical entities. But factorists do not regard them in this way (or if they do, they can be in error). Merely because it is convenient to refer to a factor (like g) by use of a noun does not make it a physical thing. At the most, factors should be regarded as sources of variance, dimensions, intervening variables, or "latent traits" that are useful in explaining manifest phenomena, much as abstractions such as gravity, mass, distance, and force are useful in describing physical events. Gould's far-reaching condemnation of factor analysis as a device for producing reifications is one of his own deepest conceptual errors; it stands factor analysis on its head. Unfortunately, it has had wide and beguiling appeal among some readers, even among some social scientists.

Fourth, although the concept of intelligence may be "nebulous" in Gould's mind, the purpose of factor analysis (and associated techniques such as psychological tests and other means of behavioral observation) is to make the concept more tangible, spelled out, and scientifically respectable. In the preceding statement, Gould seems to imply that intelligence is only a single "unilinear" dimension. Actually, factor-analytic and other types of investigations have revealed that the "socially defined" concept of intelligence corresponds to a veritable plethora of different dimensions of cognitive ability, varying in generality and import (Carroll, 1993). However, persuading my reader that this is the case must await further consideration of Gould's critique.

The next major section of Gould's chapter is devoted to the topic, "Correlation, cause, and factor analysis." In it, Gould offers an elementary exposition of various psychometric concepts, such as the Pearsonian correlation coefficient, multiple dimensions of ability, matrices, vectors, factor analysis, principal components, and rotation of axes. In the main, it is correct as far as it goes. However, even when it was written, it was out dated because it omitted mention of various techniques to circumvent the problems that Gould cited, and it actually misrepresented some of those problems. I can mention only a few.

One red herring to which Gould devotes much space is the role of cause in interpreting

correlations. After giving an explanation of what a Pearsonian correlation coefficient is, he points out, correctly, that "[t]he vast majority of correlations in our world are, without doubt, noncausal" (sic, p. 242), and that "[t]he invalid assumption that correlation implies cause is probably among the two or three most serious and common errors of human reasoning." Further, "[i]n summary, most correlations are noncausal; when correlations are causal, the fact and strength of the correlation rarely specifies the nature of the cause" (P. 243). In point of fact, factor analysts have not assumed that the correlations they deal with are causal. The usual explanation of a statistically significant correlation is that it suggests that two variables tend to measure something in common; the problem is to determine what that common something is, and whether it can be interpreted as in any way causal in its influence, or referred to still another variable that is causal. That a "factor" discovered by factor analysis is causal is only a hypothesis to be later confirmed or disconfirmed.

Gould proceeds to an exposition of "correlation in more than two dimensions," winding up with inviting the reader to consider "20 dimensions, or 100" (p. 245), and thus to appreciate "the heart of what factor analysis attempts to do." In his words, "[f]actor analysis is a mathematical technique for reducing a complex system of correlations into fewer dimensions" (p. 245), as if this were the only purpose or definition of factor analysis. Factor analysis is much more than merely a technique for reducing a system of correlations to fewer dimensions; such reduction ("factor extraction") is only the first step in determining what the reduced dimensions are and what they mean, after any appropriate transformations.

Gould complains that Spearman reified *g* as an entity and "tried to give it an unambiguous causal interpretation" (p. 251). Perhaps so, but any causal explanation that Spearman attempted to give *g* was only a hypothesis; it is only recently that investigators have been able to find at least some evidence for a physical basis for *g* in neuropsychological phenomena (see, e.g., Duncan, 1995). It is incorrect to make a wholesale accusation that factor analysts reify factors or make unjustified attributions of causal influence. Gould wrote: "Spearman's *g* is particularly subject to ambiguity in interpretation, if only because the two most contradictory causal hypotheses are both fully consistent with it: 1) that it reflects an inherited level of mental activity (some people do well on most tests because they are born smarter); or 2) that it records environmental advantages and deficits (some people do well on most tests because they are well schooled, grew up with enough to eat, books in the home, and loving parents). (p. 252)"

He fails to make clear why these two hypotheses are "most contradictory" (they would be only if it is assumed that only one of them applies) and in any case shows his ignorance or neglect of the whole of behavioral genetic science, which all along has emphasized that heredity and environment both participate, in complementary degrees, in the determination of behavioral outcomes. Actually, factor analysis says absolutely nothing about the extent to which a "factor" or dimension identified in a set of data is affected more by hereditary or environmental determinants. This is a problem for behavioral genetics and for developmental and educational research into the effects of environments or interventions, not for factor analysis.

Further on this page, Gould introduces his readers to one of his most misleading and erroneous ideas about factor analysis. He wrote:

"Another, more technical argument clearly demonstrates why principal components cannot be automatically reified as causal entities. If principal components represented the only way to simplify a correlation matrix, then some special status for them might be legitimately sought. But they represent only one method among many for inserting axes into a multidimensional space. (p. 252)"

And

"During the 1930s factorists developed methods to treat this dilemma [in finding the correct location of axes] and to recognize clusters of vectors that principal components often obscured. They did this by rotating fact or axes from the principal components orientation to new positions. . . . [But in doing this,) g has disappeared. We no longer find a "general factor" of intelligence, nothing that can be reified as a single number expressing overall ability. Yet we have lost no information. . . . How can we argue that g has any claim to reified status as an entity if it represents but one of numerous possible ways to position axes within a set of vectors? (p. 253)"

In all this, Gould seems to be claiming that factor analysis is a worthless technique (somewhere he calls it "bankrupt" because it has no way of assuring that its results are determinate). It is not until some pages later (pp. 296ff) that he considers Thurstone's contributions to factor analysis, and even here he makes mistakes. He calls Thurstone "the exterminating angel of Spearman's g (p. 296).

The fact is that Thurstone later came to accept a higher order g, not only in his monograph (Thurstone & Thurstone, 1941) on factors of intelligence in eighth graders but also in his text (1947) on factor analysis methods. Indeed, Gould acknowledges Thurstone's acceptance of a second-order g, but apparently in order to make his story consistent he wrote:

"Thurstone wrestled with what he called this "second-order" g. I confess that I do not understand why he wrestled so hard, unless the many years of working with orthogonal solutions had set his mind and rendered the concept too unfamiliar to accept at first. If anyone understood the geometrical representation of vectors, it was Thurstone. This representation guarantees that oblique axes will be positively correlated, and that a second-order general factor must therefore exist. Second order g is merely a fancier way of acknowledging what the raw correlation coefficients show-that nearly all correlation coefficients between mental tests are positive. (p. 313)"

This is a gross misrepresentation of Thurstone's views and methods of thinking. Almost from

the start, Thurstone postulated that his "primary factors" might be correlated, and was surprised to find that in the initial sample he studied, they were generally uncorrelated. In his 1938 monograph, he described them as uncorrelated mainly because at the time he had not developed completely satisfactory techniques for making them conform to his criteria for simple structure. (Gould failed to note Thurstone's statement in an autobiographical essay [Thurstone, 1952] that the publication of orthogonal results was due to a suggestion by Thorndike that his study's impact would be reduced if too many innovations were introduced in one paper). Certainly in his later years, Thurstone accepted the idea that the primary factors were often correlated - he did not live to see the further techniques that were later developed to depict relationships among factors.

It was these techniques developed later that Gould totally ignored. Already, 27 years earlier, Schmid and Leiman (1957) presented a technique for depicting the hierarchical structure of a group of variables and their factors. By 1978, Hakstian and Cattell (1978) published an important paper on "Higher-stratum ability structures on a basis of twenty primary abilities." In the meantime, factorists had devoted much attention to methods of rotating factor axes to simple structure (see Harman, 1976). Also, by 1978 the Swedish statistician Joreskog (1978) published several important contributions to factor analysis-contributions that have made it possible to confirm the role of g in explaining factor correlations (see, e.g., Gustafsson, 1984). If Gould had done his homework properly, he could have seen that his criticisms of factor analysis could no longer be well supported. I do not use space critiquing Gould's many assertions about Spearman, Burt, Jensen, and others, because they only further illustrate Gould's many errors in interpreting factor analysis.

Two final points of clarification: First, Gould claims that regardless of how factorial axes are placed, there is "no loss of information." In a sense, this is true; the situation is analogous to the fact that if you want two numbers that when multiplied together produce a given product, there is an infinity of solutions (e.g., two numbers that can be multiplied to give 48 include 1 and 48, -2 and -24, 3 and 16, .0208333 and 2304, etc., etc.) but there is no "loss of information" in producing the product. In factor analysis, however, the correct placement of axes to produce simple structure in a sense adds information, in that it specifies more clearly how much each test measures each factor, on the assumption that the measurements ("factor loadings") are generally either zero or positive, and not negative-basically the idea of "simple structure" that Thurstone (1938, 1940) initiated as a criterion for the "correct" placement of axes. Contrary to Gould's assertion in the preceding quotation, the geometrical representation of vectors does not guarantee that axes must be oblique, or that a g factor must exist. (Also, obliqueness of axes does not guarantee that they represent positive correlations; the correlations may be negative.) However, when the data dictate that correctly placed axes are oblique, it is useful to specify a higher-order factor (which may or may not be g) that accounts for their correlation, and then to compute, by the Schmid and Leiman (1957) method, a hierarchical orthogonal matrix to represent the positions of the tests in a hyperspace that still retains their simple structure. In so doing there may be a slight loss of parsimony, in that at least one more factor is required to

explain the correlations, but there is a gain of information in the sense of specifying the factor loadings on a reasonable scale.

Second, Gould claims that Thurstone's analysis permitted Burt and Spearman "at best, a weak second-order g" (p. 315). On the previous page he had asserted that "[s]econd-order g (the correlation of oblique simple structure axes) rarely accounts for more than a small percentage of the total information in a matrix of tests" (p. 314). This is truly an egregious error on Gould's part. The fact is that most of the time, g accounts for a quite large proportion of the information in a matrix of correlations among cognitive tests. Further, loadings of tests on a g factor often tend to be fairly high, particularly if the tests are observed to be "highly g-loaded" in terms of their content. The g factor can hardly be called "weak." I have estimated (Carroll, 1993, p. 57) that typically, a higher-order factor such as g constitutes about half of the common-factor variance in a cognitive test, although the proportion may vary considerably.

IN DEFENSE OF FACTOR ANALYSIS AND MENTAL TESTING

Although statisticians (e.g., Goodall, 1990) occasionally express doubts about the validity of factor analysis as a scientific methodology, it is seldom clear whether such doubts are well founded or merely the result of ignorance about recent developments in the technique. There is a large community of social scientists (psychologists, sociologists, and others) who have confidence in factor analysis and use it in analyzing different types of data. In the field of individual differences in cognitive abilities, it is prized chiefly as a method for identifying the "linearly independent" dimensions in a set of data that need to be examined and integrated with other knowledge about the structure of abilities. (Linear independence means that different dimensions can be distinguished even though they may be correlated.) The method has now achieved a high degree of sophistication and reliability, in that different investigators can obtain the same results in analyzing a given set of data (Carroll, 1995). One indication of this is that exploratory analysis procedures can correctly recover a hypothetical simple structure matrix from a correlation matrix generated from that matrix. For example, analysis can recover the structure of a matrix that contains a general factor (g), or even several higher-order factors with an overarching g factor. If a general factor is found in a set of empirical data, there is reason to believe that such a factor exists in the data, however it may eventually be interpreted.

"Confirmatory" factor analysis, as embodied in procedures developed by Bentler (1985), Joreskog and Sorbom (1989), and others, can add weight to the finding of such a general factor.

In the meantime, the technology of constructing mental and achievement tests has enormously improved over what was possible in Spearman's or Thurstone's days. IRT makes it possible to examine the unidimensionality of a mental test or other observational procedure. Although there is much work to be done in providing adequate tests and measurement procedures, it is possible to show that available procedures sample the kinds of mental processes and knowledge that operate in the real world.

For this and other reasons, it is possible to endorse the proposition that tests designed for the purpose can adequately measure a "general" or g factor of intelligence.

EPILOGUE

At this point, I hope I have demonstrated that in the main, Gould's statements and accusations about factor analysis are incorrect and unjustified, and should not be regarded as constituting an authoritative guide to evaluating this technique. However, I should add some cautions about the present-day status of g in factor analysis.

First, although a higher-order g factor is often found in factorial investigations, the precise nature of such a g factor often depends on the types of measures analyzed in an assemblage of such measures-psychological tests or other observational procedures. For example, a g factor based on a series of highly verbal tests may be biased toward the verbal abilities measured by such tests. A good measure of g must be based on a suitable variety of test materials.

The g factor may also depend on the precise way in which the g factor is calculated-whether, for example, it is calculated on the basis of a first principal component, a first principal factor, or an orthogonalization of a structure of oblique factor matrices by the Schmid and Leiman (1957) technique. Results of these different procedures are generally different only in small ways, but Jensen and Weng's (1994) work on ways of finding a "good g" suggests that the Schmid-Leiman technique is generally preferable (contrary to Jensen's [1980] previous opinion that the first principal factor is more satisfactory).

Second, psychometricians continue to be engaged in debate over the nature of g. Some feel that g is a unitary, indivisible trait, although others (e.g., Detterman, 1982; Kranzler & Jensen, 1991) postulate that it is actually a composite of a number of different traits. The reader may consult an edited work by Detterman (1994) for discussions, by a number of authorities, of this and related problems in the theory of intelligence.

Above all, it must be realized that the development of mental tests did not stop with the work of Spearman, Burt, Thurstone, and others mentioned by Gould. Current research in testing is much influenced by developments in cognitive psychology and in the study of children's mental growth. It may be hoped that at some time in the future, increased knowledge about the status of g and other factors of cognitive ability will be available, leading to positive ways in which testing can be of use in society.

The Errors and Omissions of the Revised Edition of Gould's The Mismeasure of Man

Special Review

Race, Intelligence, and the Brain: The Errors and Omissions of the Revised Edition of S. J. Gould's *The Mismeasure of Man* (1996)

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Summary - The first edition of *The Mismeasure of Man* appeared in 1981 and was quickly praised in the popular press as a definitive refutation of 100 years of scientific work on race, brain-size and intelligence. It sold 125,000 copies, was translated into 10 languages, and became required reading for undergraduate and even graduate classes in anthropology, psychology, and sociology. The second edition is not truly revised, but rather only expanded, as the author claims the book needed no updating as any new research would only be plagued with the same 'philosophical errors' revealed in the first edition. Thus it continues a political polemic, whose author engages in character assassination of long deceased scientists whose work he misrepresents despite published refutations, while studiously withholding from his readers 15 years of new research that contradicts every major scientific argument he puts forth. Specific attention in this review are given to the following topics: (1) the relationship between brain size and IQ, (2) the importance of the scientific contributions of Sir Francis Galton, S. G. Morton, H. H. Goddard, and Sir Cyril Burt, (3) the role of early IQ testers in determining U.S. immigration policy, (4) The Bell Curve controversy and the reality of g, (5) race/sex/social class differences in brain size and IQ, (6) Cesare Lombroso and the genetic basis of criminal behavior, (7) between-group heritabilities, inter-racial adoption studies, and IQ (8) why evolutionary theory predicts group differences, and (9) the extent to which Gould's political ideology has affected his scientific work.

Introduction

"May I end up next to Judas Iscariot, Brutus, and Cassius in the devils mouth at the center of hell if I ever fail to present my most honest assessment and best judgment of evidence for empirical truth" (p. 39). So swears one Stephen Jay Gould, justifiably worried that his activist background may have tarnished his reputation for scholarship. Critical examination of the new edition of *The Mismeasure of Man* shows that, indeed, Gould's resort to character assassination and misrepresentation of evidence have caught up with him.

Hailed in the popular media as the definitive deconstruction of the 'myth' that science is an objective enterprise, the original *The Mismeasure of Man* was in fact an ad hominem attack on eminent scholars, past and present, who have scientifically studied race, intelligence, and brain size. Despite the masses of empirical research using state-of-the-art technology published in highly prestigious journals that refute the obscurantist arguments Gould first served up in 1981, all the chapters of the initial edition have now been unapologetically regurgitated. Gould's failure not only to conduct any empirical research of his own but to even acknowledge the existence of any and all contradictory data speaks for itself. Revealed political truth may abhor revision but science thrives on it. Scientist that he is, Gould may yet regret agreeing to produce this 'revision'.

Rather than being appropriately revised, the original edition of *The Mismeasure of Man* has merely been expanded. Gould includes a 30-page preface on why he wrote the original and why the renewed interest in race, behavior, and evolution, required that he 'revise' it after 15 years, although he also maintains (p. 35) that his 1981 arguments needed no modification. Gould's 1996 book also contains five end chapters including essays on J. F. Blumenbach, the 19th century German anthropologist who developed the first scientific system of racial hierarchy, and Gould's own previously published reviews of Herrnstein and Murray's (1994) *The Bell Curve*.

After carefully reading the book, I charge Gould with several counts of scholarly malfeasance. First, he omits mention of remarkable new discoveries made from Magnetic Resonance Imaging (MRI) which show that brain-size and IQ correlate about 0.40. These results are as replicable as one will find in the social and behavioral sciences and utterly destroy many of Gould's arguments. Second, despite published refutations, Gould repeats verbatim his defamations of character against long deceased individuals. Third, Gould fails to respond to the numerous empirical studies that show a consistent pattern of race differences in IQ, brain size, crime, and other factors that have appeared since his first edition went to press.

Brain-Size/IQ Relations: Where Was Gould During The Decade Of The Brain?

In the opening chapters, Gould charges 19th century scientists with 'juggling' and 'finagling' brain size data in order to place Northern Europeans at the apex of civilization, lower orders trailing behind in a great chain of being. He argues that, in effect, Paul Broca, Francis Galton, and Samuel George Morton, all erred in the same direction and by similar magnitudes. Implausibly, Gould asks us to believe that Broca 'leaned' on his autopsy scales when measuring

wet brains by just enough to produce the same differences that Morton caused by 'over-packing' empty skulls using filler, as did Galton's extra loose grip on calipers while measuring heads!

Later in the book, Gould attempts to discredit such 20th century luminaries as H. H. Goddard, Lewis Terman, R. M. Yerkes, Charles Spearman, Cyril Burt, Hans Eysenck and Arthur Jensen who, Gould claims, mean-spiritedly set out to measure IQ and fabricate its heritability. Gould specifically charges psychometricians with the sin of reification, that is, treating hypothetical constructs as though they were real entities. His major target is the general factor of intelligence (known as *g*). Contrary to Gould, every major study shows that different IQ tests tend to be significantly intercorrelated (Carroll, 1993) and that *g* is the 'active ingredient' in IQ predictions (Brody, 1992).

Gould's omission of recent, devastatingly contradictory evidence constitutes at best shoddy and at worst dishonest scholarship. Even before Gould's (1981) first edition, Van Valen (1974) had reviewed the literature and estimated an overall correlation of 0.30 between brain size and intelligence. Gould (1981) neglected to even mention Van Valen's review. The 1990s have been called the 'Decade of the Brain' for good reason. Remarkable discoveries made using MRI confirm many of the relationships described by the 19th century visionaries defamed by Gould. Neither Gould nor his publisher show any scruples in releasing these chapters without the required revisions. Since Gould chose to withhold this evidence from his extensive readership, allow me to reveal it. (For more detail, see the review by Rushton & Ankney, 1996).

The published research that most clearly shows the correlation between brain size and intelligence employed MRI, which creates, in vivo, a three-dimensional image of the brain. An overall correlation of 0.44 was found between MRI-measured-brain-size and IQ in 8 separate studies with a total sample size of 381 non-clinical adults. This correlation is about as strong as the relationship between socioeconomic status of origin and IQ. In seven MRI studies of clinical adults ($N = 312$) the overall correlation was 0.24; in 15 studies using external head measurements with adults ($N = 6,437$) the overall correlation was 0.15, and in 17 studies using external head measurements with children and adolescents ($N = 45,056$) the overall correlation was 0.21. The head size and brain size correlation with the *g* factor itself, which Gould would have you believe is a mere artifact, is even larger --- 0.60! (Jensen, 1994; Wickett et al., 1996).

Further, the brain-size/IQ correlation is predictive from birth. The National Collaborative Perinatal Study analyzed data from 17,000 White babies and 19,000 Black babies followed from birth to 7 years (Broman et al., 1987). Head perimeters were measured at birth for all children. At age 7, head perimeters were remeasured and IQ assessed. For both the Black and the White children, head perimeter measured at birth significantly predicted head perimeter at 7 years, and head perimeter at both ages predicted IQ!

The first of these MRI studies were published in the late 1980s and early 1990s in leading, refereed, mainstream journals like *Intelligence* (Willerman et al., 1991) and the *American*

Journal of Psychiatry (Andreasen et al., 1993). I know Gould is aware of them because my colleagues and I routinely sent him copies as they appeared and asked him what he thought! For the record, let it be known that Gould did not reply to the missives regarding the published scientific data that destroyed the central thesis of his first edition.

Further evidence of Gould's method is the way the 1996 edition deletes the very section of the 1981 edition that discussed the brain-size/IQ relation. In the 1981 edition (pp. 108-111), Gould cited Jensen's (1980) *Bias in Mental Testing* (pp. 361-362) in order to pooh-pooh Jensen's report of a 0.30 correlation between brain-size and IQ and a table from Hooton (1939) which showed that average head sizes differed by SES. Gould (1996) gives no reason for making this selective cut, which would have appeared on page 140 of the new edition. I can only infer that when Gould read Jensen's (1982) review of his book, which he mentions doing in the introduction, he realized that Jensen's citation of the 0.30 correlation between brain size and IQ was based on Van Valen's (1974) review and so could no longer be dismissed as just Jensen. I submit that Gould realized that repeating this section verbatim, given the weight of the new evidence, would destroy his entire thesis. Rather than revise his arguments in light of the truth, Gould chose to repeat them without change and to withhold any evidence to the contrary. Both Gould and his publisher owe it to their readers to explain why this supposedly 'new' edition studiously avoids any mention of all the new evidence.

Is it reasonable to expect that brain size and cognitive ability are related? Yes! Haug (1987, p.135) found a correlation of 0.479 ($N = 81$, $P < 0.001$) between number of cortical neurons (based on a partial count of representative areas of the brain) and brain size in humans. His sample included both men and women. The regression relating the two measures is: number of cortical neurons (in billions) = $5.583 + 0.006$ (cm³ brain volume). According to this equation, a person with a brain size of 1,400 cm³ has, on average, 600 million fewer cortical neurons than an individual with a brain size of 1,500 cm³. The difference between the low end of the normal distribution (1,000 cm³) and the high end (1,700 cm³) works out to be 4.2 billion neurons. That amounts to 27% more neurons for a 41% increase in brain size. The best estimate is that the human brain contains about 100 billion (10¹¹) neurons classifiable into perhaps as many as 10,000 different types resulting in 100,000 billion synapses (Kandel, 1991). Even storing information at the low average rate of one bit per synapse, which would require two levels of synaptic activity (high or low/on or off), the structure as a whole would generate 10¹⁴ bits of information. Contemporary supercomputers, by comparison, typically have a memory of about 10⁹ bits.

On Character and Character Assassination

Gould's faults extend well beyond sins of omission to include sins of commission. The 'new' edition repeats the same false accusations that have been well refuted since 1981. Thus, Gould leaves unmodified his denigration of Sir Francis Galton as a 'dotty Victorian eccentric' (p. 108) despite having been called to account for painting a thoroughly tendentious portrait by

University of Cambridge statistician, A. W. F. Edwards (1983) in the London Review of Books. Edwards rightly excoriated Gould, as the author of a book full of references to correlation, regression (including multiple regression), principal components analysis, and factor analysis, for failing to inform his readers that this whole statistical methodology is derived from Galton's pioneering work on the bivariate normal distribution and linear regression.

Gould also repeats verbatim his (1981) claim that S. G. Morton (1799-1851), one of the giants of 19th American science, 'unconsciously' doctored his results on cranial capacity so as to prove Caucasian racial superiority, despite the fact that when J. S. Michael (1988) remeasured a random sample of the Morton collection he found that very few errors had been made, and that these were not in the direction that Gould had asserted. Instead, the errors were in Gould's own work! Michael concluded that Morton's research "was conducted with integrity...(while)...Gould is mistaken" (p. 353).

Other refutations of Gould's original edition of *The Mismeasure of Man* appeared in the 1987 and 1988 issues of the *American Psychologist*. Gould claimed to have detected "conscious skullduggery" in Goddard's (1912) study of the heritability of feeble-mindedness in the Kallikak family and alleged that Goddard's photographs had been 'phonied' by inserting heavy lines to give the eyes and mouth a 'depraved', 'sinister', and 'diabolical appearance'. However, not only was such retouching common during the period and thus betrays no evil intent (Fancher, 1987), but the retouched photographs actually strike judges (when empirically tested) as appearing kind (Glenn & Ellis, 1988).

Similarly, Gould repeats his trashing of Sir Cyril Burt's reputation, citing the initial verdict against him by Hearnshaw (1977) and avoiding any mention of the new evidence that has since come to light. Recall that Burt (1883-1971) was the distinguished British educational psychologist who reported a heritability for IQ of 77% for identical twins reared apart. Subsequently, he was widely accused of fabricating his data. However, five separate studies of identical twins raised apart have now corroborated Burt's finding (Jensen, 1992; see also Bouchard et al., 1990; Pedersen et al., 1992). The average heritability from these studies is 75%, almost the same as Burt's supposedly 'faked' heritability of 77%. Moreover, two independently written, meticulously thorough books, one by Robert B. Joynson (1988) and the other by Ronald Fletcher (1991), have vindicated Burt and described how he was railroaded by those on both sides of the Atlantic dedicated to destroying hereditarian findings.

Early IQ Testers, Immigration, And The Holocaust

Gould's most inflammatory allegation consists of blaming IQ testers for magnifying the toll of those lost in the Holocaust (p. 263). Here he has followed the lead of Leon Kamin's (1974) *The Science and Politics of IQ*. The Kamin-Gould thesis is that early IQ testers claimed their research proved that Jews as a group scored low on their tests and that this finding was then conveniently used to support passage of the restrictive Immigration Act of 1924 which then

denied entry to hapless Jewish refugees in the 1930s. Gould goes so far as to claim (1996, pp. 195-198; 255-258) that Henry H. Goddard (in 1917) and Carl C. Brigham (in 1923) labeled four-fifths of Jewish immigrants as "feeble-minded ... morons".

The facts are very different. Goddard wanted to find out if the Binet test was as effective at identifying 'high-grade defectives' (the term then used for those with mental ages between eight and twelve) among immigrants as it was among native-born Americans. By 1913, Goddard had translated the Binet test into English and arranged, over a two-and-a-half-month period, for it to be given to a subset of Jewish, Hungarian, Italian, and Russian immigrants "preselected as being neither 'obviously feeble-minded' nor 'obviously normal'" (Goddard, 1917, p. 244, emphasis added). Among this "unrepresentative" group (178 subjects in all), the tests successfully categorized 83% of the Jews, 80% of the Hungarians, 79% of the Italians, and 87% of the Russians. Goddard (1917) explicitly did not assert that 80% of Russians, Jews, or any immigrant group in general were feeble minded nor that the figures were representative of all immigrants from those nations. Nor did he claim that the feeblemindedness he was measuring was due to heredity. The vast majority of the many immigrants going through Ellis Island were never given mental tests. Nor was a random sample of any national group of immigrants ever tested. The only study by Goddard involving the testing of immigrants begins with the following sentence: "This is not a study of immigrants in general but of six small highly selected groups..." (1917, p. 243).

Gould's account of Brigham's (1923) *A Study of American Intelligence* is also misleading. Brigham examined the First World War intelligence tests given to 15,543 White officers, 93,955 White recruits, and 23,596 'Negro' recruits. The White recruits were subdivided into 81,465 native born ('Nordic' in origin) and 12,492 foreign born (categorized by country of origin as being primarily 'Nordic', 'Alpine', or 'Mediterranean'). Brigham found that U.S.-born White officers averaged a 'mental age' of about 17.3, U.S.-born White draftees about 13.3 years, foreign-born English speaking Nordics about 13.4 years, foreign-born non-English speaking Nordics about 12.6 years, foreign-born Alpines about 11.7 years, foreign-born Mediterraneans about 11.5 years, and Negroes about 10.7 years. Brigham made only passing reference to Jewish IQ (pp. 187-190) noting that no separate scores existed for them. But, by assuming that the proportions from the U.S. Census of 1910 were generalizable to his army recruits (implying that 50 percent of his Russian-born sample was Jewish, and that the Jewish subset scored about the same as other Russians), Brigham concluded that their mean mental age could be estimated at about 11.5 years. Brigham concluded that these data, taken at face value, did "tend to disprove the popular belief that the Jew is highly intelligent" (p. 190), but he immediately qualified this by noting that the standard deviation of the Russian sample was the highest of any immigrant group and that talent searches in New York and California schools often found high ability among Jewish children. Nonetheless, he did remark, somewhat snidely, that "the able Jew is popularly recognized not only because of his ability, but because he is able and a Jew" (p. 190).

For all their faults, the true story of the early IQ testers is a far cry from Gould's attempt to label

them as unindicted co-conspirators in genocide. What is especially vexing about Gould's account is that he repeats it despite widely disseminated refutations. Historian of psychology Franz Samelson (1975, 1982) began the process of setting the record straight with his review of Kamin's book in the journal *Social Forces*. Perhaps the most incisive of these refutations appeared in a paper by Mark Snyderman and the late Richard Herrnstein in the 1983 issue of the *American Psychologist*. Snyderman and Herrnstein fully corroborated Samelson's conclusions, pointing out that the testing community in general did not view its findings as favoring restrictive immigration policies like those in the 1924 Act. As far as Snyderman and Herrnstein could ascertain from the records and publications of the time, Congress took virtually no notice of intelligence testing. None of the major contemporary figures in testing were called to testify, nor were any of their writings inserted into the legislative record.

In his 1981 book *In Search of Human Nature*, the eminent historian Carl N. Degler took Gould to task for ignoring contradictory information. Degler pointed out, for example, that it was the evidence of high IQs in Jews and Chinese in California that led Lewis Terman to strengthen his view that the low Black IQ was heritable. Degler also pointed out that although the comparatively high scores of Orientals did not prevent them from being excluded from immigration, such scores would embarrass any attempt to make IQ the basis for ethnic bias in immigration. Again, in 1992, the noted columnist Daniel Seligman debunked Gould's anti-testing propaganda in his book *A Question of Intelligence*. Most revealing of Gould's scholarship, perhaps, is that Herrnstein and Murray (1994) also highlighted the issue in a special boxed section on page 5 of *The Bell Curve*, a book that Gould reviewed (twice!). Did Gould overlook these refutations? Why did he not respond to them in his 'revision'?

The early IQ testers were far more aware of the effects of environmental and cultural background on their test takers than Gould would have you believe. They clearly stated that many high-IQ groups had been excluded from the draft sample, including those in occupations exempted from the draft as being vital to the war effort. Gould acknowledges these facts (p. 252) but puts on the spin that if Yerkes (1921) knew of flaws in his massive monograph *Psychological Examining in the United States Army*, from which Brigham (1923) drew his data, this only made the conclusions even more obviously biased than they otherwise would have been.

The reality of g?

Eighty years of theoretical and applied progress, unrivalled in virtually any other field of psychology, have done nothing to diminish the fervor of Gould's anti-psychometric zealotry. In his review of *The Bell Curve*, Gould (1996, pp. 370-376) charges Herrnstein and Murray (1994) with 'disingenuousness'. First, Gould alleges disingenuousness of content, for he claims that *The Bell Curve* is really about race, but pretends to be about IQ. Second, he alleges there is disingenuousness of argument, for *The Bell Curve* fails to report openly the strength of statistical relationships. Finally, he claims there is disingenuousness of political program, for

The Bell Curve attempts to justify cutting social programs while claiming to be in the tradition of Jeffersonian democracy.

Gould withholds from his readers that *The Bell Curve* is mainly an empirical work about the causes of social stratification and that it reached its conclusions only after fully analyzing a 12-year longitudinal study of 12,486 youths (3,022 of whom were African American) which showed that most 17-year-olds with high IQs (Blacks as well as Whites) went on to occupational success by their late 20s and early 30s whereas many of those with low IQs (both Black and White) went on to welfare dependency. The average IQ for African Americans was found to be lower than those for Latino, White, Asian, and Jewish Americans (85, 89, 103, 106, and 115, respectively, pp. 273-278). Failure to mention these data fosters the false belief that IQ tests are not predictive and are biased in favor of North Europeans.

In an afterword to the softcover edition of *The Bell Curve*, Charles Murray (1996) chides Gould and his reviews for being hopelessly out of date regarding the evidence for the biological basis of *g* and for dismissing as 'trivial' the predictive power of IQ in *The Bell Curve* sample. Murray invites Gould to "count the ways" in which *g* does in fact capture "a real property in the head". The higher the *g* loading of a subtest, the higher is its heritability, the higher the degree of inbreeding depression (an established genetic phenomenon) a test exhibits, the higher its relation to elementary cognitive tasks like reaction time, and the more it is related to physiological processes such as cortical evoked potentials and the brain's consumption of glucose. Murray also accuses Gould of misleading readers by focusing on the R^2 statistics given in the appendix, rather than on the IQ predictions given in the text. As Murray concludes "The relationships between IQ and social behaviors that we present in the book are so powerful that they will revolutionize sociology" (p. 569).

Gould likes to leave his readers chanting the mantra that "*g* is nothing more than an artifact of the mathematical procedure used to calculate it". Jensen and Weng (1994) and Carroll (1995) provide detailed empirical and analytical demonstrations of the reality of *g*. Suffice to note for the purposes of this review that they find that *g* is remarkably robust and invariant across different data sets, different statistical procedures, or even simulated data, and that Gould avoids any mention of these studies.

Race and IQ: What Gould Doesn't Want You To Know

In his critique of *The Bell Curve*, Gould acknowledges (p. 369), and then quickly sidesteps the finding that Orientals have a small average IQ advantage over Whites and a large one over Blacks, despite being aware that *The Bell Curve* brought Richard Lynn's (1991) detailed compilation of these data to wide attention. Because Gould dodged the issue allow me to address it. Lynn (1991, 1996) showed that, on average, Orientals score higher on tests of mental ability than do Whites, both within the U.S.A. and in Asia, whereas Africans and Caribbeans score lower. Oriental populations in East Asia and North America typically have mean IQs falling

between 101 to 111. White populations in Europe, South Africa, Australasia, and North America have mean IQs of from 85 to 115, with an overall mean of 100. Black populations living south of the Sahara, in the Caribbean, in Britain, and in North America, average IQs of from 70 to 90.

Especially contentious was Lynn's calculation of a mean IQ of only 70 for Black Africans living south of the Sahara. Many reviewers have expressed skepticism about such a low IQ, holding it impossible that, by European standards, 50 percent of Black Africa is 'mentally retarded'. But a mean African IQ of 70 has been confirmed in three studies since Lynn's review, each of which used Raven's Progressive Matrices, a test regarded as an excellent measure of the non-verbal component of general intelligence and one not bound by culturally specific information. Kenneth Owen (1992) found it (a mean IQ of 70) in a sample of over 1,000 South African 13-year-olds, Fred Zindi (1994), a Black Zimbabwean, found it in a study of 12- to 14-year olds in Zimbabwe, and Richard Lynn (1994a) found it in a study of Ethiopian immigrants to Israel. In a reply to Leon Kamin regarding these data, Charles Murray (1995) wrote: "When data are as carefully collected and analyzed as these, attention must be paid" (p. 22).

Speed of decision making (reaction time) in 9- to 12-year olds, in which children decide which of several lights stands out from others, shows that the racial differences in mental ability are not restricted to paper and pencil tests. All children can perform the task in less than one second, but more intelligent children, as measured by traditional IQ tests, perform the task faster than do less intelligent children. Lynn (1991) found Oriental children from Hong Kong and Japan were faster on average in decision time (controlling for movement time) than were White children from Britain and Ireland, who in turn were faster than Black children from South Africa. Using the same decision time tasks, Jensen (1993) found the same racial ordering in California school children.

Race and Brain Size: What Gould Doesn't Want You To Know

It seems unlikely that Gould's scornful remarks about early studies of racial differences in brain size were based on an objective assessment of the literature. First, investigation of the studies Gould does cite show him up to his usual tricks of hiding and distorting data. Second, although numerous modern studies have appeared since his 1981 edition went to press, he fails to make the corrections required by them or even to acknowledge their existence.

Consider, for example, a section titled "A Curtain Raiser With a Moral". In this, Gould (1996, 109-114) reviewed a technical debate over Black/White brain-size differences between Robert Bennett Bean (1906), a Virginia physician, and Franklin P. Mall (1909), Beans mentor at Johns Hopkins Medical School. Bean (1906) published a study finding that the weight of 103 American Negro brains at autopsy varied with the amount of Caucasian admixture, from 0 admixture = 1,157 grams, 1/16 = 1,191 grams, 1/8 = 1,335 grams, 1/4 = 1,340 grams, to 1/2 = 1,347 grams. Bean also reported that the 103 Negro brains were less convoluted than were 49 White brains and that Whites had a proportionately larger genus to splenium ratio (front to back

part of corpus callosum), implying that Whites may have more activity in the frontal lobes which were thought to be the seat of intelligence. Mall (1909) disagreed and found that he was unable to replicate the results on genus/splenium ratios when he remeasured a subset of the brains under 'blind' conditions regarding the race of the brain. Gould elevated this disagreement on one of the findings into a morality play. (Mall "became suspicious"; "prior prejudice dictates conclusions"). What Gould neglects to tell us is that Mall himself (p. 7) reported a Black/White difference in brain weight of 100 grams and that he did not refute the data on racial admixture or on complexity of convolutions.

J. S. Michael's (1988) revelation of Gould's mistreatment of Samuel George Morton's 19th century data has been described above. Nonetheless, Michael remained doubtful that Morton's data could be used to examine race differences in brain size. Rushton (1989a), however, showed that Morton's data, even as reassessed by Gould, indicated that in cubic inches, Mongoloids averaged 86.5, Caucasoids 85.5, and Negroids 83.0, which convert to 1,401, 1,385, and 1,360 cm³, respectively. To be absolutely clear there is no misunderstanding about these data and to allow readers to combine the subgroups in their own preferred ways, Table 1 presents Gould's own retabulation of Morton's data (1981, p. 66, Table 2.5; 1996, p. 98, Table 2.5). Gould dismisses these differences as "trivial". But, as noted, a difference of 1 cubic inch (16 cm³) in brain size translates into a very nontrivial millions of neurons and hundreds of millions of synapses.

Table 1. S.J. Gould's 'corrected' final tabulation of Morton's assessment of racial differences in cranial capacity

Population	Cubic inches	Cubic centimeters
Native Americans	86	1410
Mongolians	87	1427
Modern Caucasians	87	1427
Malays	85	1394
Ancient Caucasians	84	1378
Africans	83	1361

Finally, consider the pattern of decreasing mean brain size going from East Asians to Europeans

to Africans shown in Rushton's (1989a) reanalysis of Gould's retabulation of Morton's data. This pattern has been corroborated since 1980 by three different techniques: wet brain weight at autopsy, volume of empty skulls using filler, and volume estimated from external head sizes. Recently, a fourth technique, Magnetic Resonance Imaging (MRI), has confirmed the White/Black difference. The preponderance of evidence from studies using different techniques, conducted by different researchers, on different samples, confirms the conclusion that the brains of Orientals and their descendants average about 17 cm³ (1 in³) larger than those of Europeans and their descendants whose brains average about 80 cm³ (5 in³) larger than those of Africans and their descendants.

Consider the following statistically significant comparisons (sexes combined) from recently conducted studies using the four techniques mentioned above. Using brain mass at autopsy, Ho et al. (1990) summarized data for 1,261 individuals. They reported a mean brain weight of 1,323 grams for White Americans and 1,223 grams for Black Americans. Using endocranial volume, Beals et al. (1984) analyzed about 20,000 skulls from around the world and found that East Asians, Europeans, and Africans averaged cranial volumes of 1,415, 1,362, and 1,268 cm³ respectively. Using external head measurements from a stratified random sample of 6,325 U.S. Army personnel, Rushton (1992) found that Asian Americans, European Americans, and African Americans averaged 1,416, 1,380, and 1,359 cm³, respectively. Using external head measures from tens of thousands of men and women from around the world collated by the International Labour Office, Rushton (1994) found that Asians, Europeans, and Africans averaged 1,308, 1,297, and 1,241 cm³, respectively. Finally, an MRI study in Britain found that people of African and of Caribbean background averaged a smaller brain volume than did those of European background (Harvey et al., 1994).

Contrary to most purely environmental theories, racial differences in brain size show up early in life. Data from the U.S. National Collaborative Perinatal Project on 19,000 Black children and 17,000 White children showed that Black children had a smaller head perimeter at birth and, although Black children were born shorter in stature and lighter in weight than White children, by age 7 'catch-up growth' led Black children to be larger in body size than White children. However, Blacks remained smaller in head perimeter (Broman et al., 1987). Further, head perimeter at birth, 1 year, 4 years, and 7 years correlated with IQ scores at age 7 in both Black and White children ($r = 0.13$ to 0.24).

Sex Differences: What Gould Doesn't Want You To Know

An absolute difference in brain size between men and women has not been disputed since at least the time of Broca (1861). He assembled a series of 292 male brains and found an average weight of 1,325 grams, while 140 female brains averaged 1,144 grams, a difference of 181 grams. Gould claimed that the sex difference disappears when appropriate statistical corrections are made for body size or age of people sampled. However, when Gould used multiple regression to remove the simultaneous influence of height and age, he only succeeded in

reducing the sex difference by one third, to 113 grams. Gould then invoked additional unspecified age and body parameters, claiming that if these could be controlled the entire difference would disappear.

David Ankney (1992) questioned Gould's methodology. He reexamined autopsy data on 1,261 American adults (Ho et al., 1980) and found that at any given body surface area or height, men's brains are heavier than are women's brains. For example, among those who are 168-cm tall (5' 7"; the approximately overall mean height for men and women combined), brain mass of men averages about 100 g heavier than that of women, whereas the average difference in brain mass, uncorrected for body size, is 140 g. Thus, only about 30% of the sex difference in brain size is due to differences in body size.

Ankney's (1992) results were confirmed in the study of cranial capacity in a stratified random sample of 6,325 U.S. Army personnel (Rushton, 1992). After adjustment, via analysis of covariance, for effects of age, stature, weight, military rank, and race, men averaged 1,442 cm³ and women 1,332 cm³. This difference was found in all of 20 or more separate analyses performed to rule out any body-size effect (see Rushton, 1992; pp. 406-408). Moreover, the male/female difference was replicated across samples of Asians, Whites, and Blacks, as well as across samples of officers and enlisted personnel. The sex difference of 110 cm³ found by Rushton (1992) from analysis of external head measurements is remarkably similar to the 100 grams obtained in Ankney's (1992) analysis of brain mass (1 cm³ = 1.036 grams, Hofmann, 1991).

The brain size studies do present a paradox. Women have proportionately smaller brains than do men but, apparently, the same intelligence scores. This was recognized in stronger form over 100 years ago. Gould cites G. Hervé, a colleague of Broca's, who wrote in 1881; "Men of the black races have a brain scarcely heavier than that of a white woman." Gould's (1996, p. 135) response was a political one, namely "I do not regard as empty rhetoric a claim that the battles of one group are for all of us". David Ankney (1992, 1995) had a more scientific response. He suggested that the difference in brain size relates to those intellectual abilities at which men excel; that spatial and mathematical ability may require more "brain" power than do verbal abilities. Other theories are that men average slightly higher in general intelligence than do women (Lynn, 1994b); or that these particular differences in brain size have nothing to do with cognitive ability but reflect greater male muscle mass and physical co-ordination on tasks like throwing and catching.

Social Class: What Gould Doesn't Want You To Know

As mentioned earlier, Gould inexplicably deleted a table which showed that averaged head sizes increased with each of 8 steps of vocational status from Hooton (1939) that had appeared on p. 109 of his first edition. Numerous other nineteenth- and early twentieth-century data sets (Broca, 1861; Sorokin, 1927; Topinard, 1878) confirmed that people of higher status occupations

averaged a larger brain or head size than did those in lower ones. For example, Galton collected head measurements and information on educational and occupational background from thousands of individuals at his laboratory in the South Kensington Natural History Museum in London. However, he had no statistical method for testing the significance of the differences in head size between various occupational groups. Nearly a century later, Galton's data were analyzed by Johnson et al. (1985), who found that the professional and semiprofessional groups averaged significantly larger head sizes (both length and width) than did unskilled groups. The results were striking for men but less clear-cut for women. Rushton and Ankney (1996) calculated cranial capacities from Johnson et al. (1985), of Galton's head-size data and found that cranial capacity increased from unskilled to professional classes from 1,324 to 1,468 cm³ in men but only from 1,256 to 1,264 cm³ in women (figures uncorrected for body size). Gould mentions none of this more recent work in his purported revision.

Natural Born Criminals: What Gould Doesn't Want You to Know

In his revised edition, Gould (pp. 151-175) continues to ridicule the 'ape-in-some-of-us' hypothesis proposed by Cesare Lombroso (1836-1909), the Italian physician and anthropologist who founded the discipline of criminology. Lombroso argued that many criminals were throwbacks to man's ancestral past, ill-suited to life in civilized society, and that therefore 'natural born criminals' could be identified by the presence of the anatomical signs of primitiveness he termed 'stigmata'. But, contrary to Gould, Lombroso was no monomaniac and also believed that criminal behavior could arise in 'normal' men.

Lombroso carried out several anthropometric surveys of the heads and bodies of criminals and noncriminals, including a sample of 383 crania from dead convicts. He claimed that, as a group, criminals evidenced many features he considered primitive, including smaller brains, thicker skulls, simpler cranial sutures, larger jaws, preeminence of the face over the cranium, a low and narrow forehead, long arms, and large ears. Lombroso also examined African tribes in the Upper Nile region finding so many of these allegedly primitive traits that he concluded criminality would be considered normal behavior among them.

While Gould delights in lampooning such early evolutionary thinking, he fails to tell his readers that though Lombroso's description of the individual trees was distorted by the prejudicial lens of his time, he correctly saw the forest. Lombroso was the first to understand how Darwin's theory of evolution provides a biological understanding for why some people are more prone to criminality than are others, how certain physical indicators allow us to predict criminality, and to recognize the critical role of the forebrain in inhibiting violent and antisocial behavior.

The reader of *The Mismeasure of Man* will search in vain for even a dismissing reference to any of the following recent studies of the biological correlates of criminal behavior. Raine (1993) reviewed several studies that used the state-of-the-art techniques of Computerized Tomography (CT), Magnetic Resonance Imaging (MRI), and Positron Emission Tomography (PET) to study

the brains of violent and sexual offenders. He tentatively concluded that frontal lobe dysfunction was associated with violent behavior including rape. Moreover, given the relation between brain size and IQ (Rushton & Ankney, 1996; see above), Lombroso's finding of a smaller brain in criminals relative to non-criminals is likely correct. Numerous American studies from those of H. H. Goddard in 1917 to the present, including The Bell Curve's 12 year longitudinal study of over 12,000 youth (Herrnstein & Murray, 1994), have established the predictive relationship between IQ and crime.

Nor does Gould feel compelled to let his readers know that Lombroso's ideas have received considerable support from recent work in behavioral genetics, a science that barely existed when Lombroso conducted his pioneering work. The same 1993 review by Raine (neither cited nor mentioned by Gould) describes 10 twin studies of adult crime based on official convictions. These studies yielded 13 analyses that together gave a concordance rate for criminal behavior of 52% for 202 monozygotic twins and only 21% for 345 dizygotic twins.

American, Danish, and Swedish studies of children who were adopted in infancy provide a means of testing the genetic theory of criminal behavior against the environmental theory. These studies support the findings of the twin studies and Lombroso's theory of 'natural born criminals'. Adopted children were at greater risk for criminal convictions if their biological parents had been convicted of a crime than if their adoptive parents had been. In a Danish study of some 14,000 adoptees, boys who had neither adoptive nor biological criminal parents, themselves had a 14% rate of criminal conviction. If the adoptive, but not biological parents were criminals, boys still had a conviction rate of only 15%. But if the biological but not adoptive parents were criminal, the rate increased to 20%. And, if both biological and adoptive parents were criminal, the rate increased to 25% (Mednick et al., 1984).

Studies that use self-reports of criminal behavior tell the same story as do studies of official arrest records. In one massive study, Rowe (1986) sampled almost all the eighth to twelfth graders in the Ohio Public Schools and found that MZ twins were roughly twice as alike in their self-report delinquency as were DZ twins, yielding a heritability of about 50%. Another recent study (Rushton, 1996) of 274 adult twin pairs used retrospective self-reports about destroying property, fighting, carrying and using a weapon, and struggling with the police and found a 50% heritability for such violent behaviors. Questionnaire studies of related traits such as altruism, aggression, and empathy in adults also typically show a 50% heritability (Rushton et al. 1986). Within the same family (that is, where socioeconomic status is identical), studies show it is the less intelligent and the more aggressive siblings who are more prone to delinquency.

Nor is Lombroso's concept of stigmata as far out as Gould would have you believe. In fact, the theory of bodily markers of abnormal behavior is making a comeback, albeit from an environmentalist as well as a genetic perspective. During gestation, an insult to the fetus (such as a drug in the mothers body) that disturbs brain development, may simultaneously produce a minor physical anomaly (termed an MPA) on the external body surface. For example, during the

course of pregnancy, the ears start low on the neck of the fetus and gradually drift into their standard positions. An insult to development can prematurely stop this upward migration of the ears and result in low-set ears -- an observable MPA. Thus, the number of MPAs serves as a rough index of (perhaps hidden) central nervous system anomalies. For children raised in unstable families, Raine (1993) found that the number of MPAs at age 12 year was related to violent behaviors at age 21. More generally, Raine's review found that antisocial children often appear markedly less attractive than normal children. In one sample of over 11,000 criminals and 7,000 controls, 60% of criminals but only 20% of controls had facial deformities, as judged by expert plastic surgeons.

Finally, consider the striking racial differences in criminal behavior. These differences are consistent across time, national boundaries, and political-economic system, which argues strongly for their having some genetic component. For example, as far back as records go, in the U.S., Orientals have been underrepresented and Blacks overrepresented in crime statistics relative to Whites. This pattern is not specific to the U.S. but is repeated around the world. Analyses of INTERPOL Yearbooks throughout the 1980s show that African and Caribbean countries have double the rate for violent crime of European countries and three times the rate of the countries in the Pacific Rim. The combined figures for murder, rape, and serious assault per 100,000 population for 1984 and 1986 were Africans -- 142, Europeans -- 74, and Asians -- 43. For 1989-90, the pattern was unchanged: Africans -- 240, Europeans -- 75, and Asians -- 32 (Rushton, 1990, 1995a).

It is unfortunate that Gould does not even cite, let alone attempt to refute any of these studies. Even if all of them are in some way biased and all my reasoning flawed, Gould owes it to those who rely upon his work to explain how this is so. More unfortunate is that by dismissing out of hand the hypothesis of the inclination to criminal behavior by some sneering remarks on the early work of the long-dead Lombroso and ignoring the latest research, Gould is actively obstructing scientists from finding the biogenetic treatments and environmental intervention strategies that could spare both future victims and delinquents (who, in their own way, are victims of their genes and their environments). It is thus Gould who is -- in Lombroso's words -- the delinquent man.

Between-Group Heritabilities: What Gould Doesn't Want You to Know

Gould (1996, pp. 186-187, 369-370) continues to disparage the possibility of generalizing within-group findings to the causes of between-group differences. When environmentalists use nutrition as an explanation of both within-group and between-group differences this is (sensibly) not disputed. But when the exact same inference is made for heritabilities to explain both within-group and between-group differences, Gould argues it is inappropriate. But, if poor nutrition is shown to have an effect 'within' Whites and Blacks, it is sensible to suppose that nutrition has an effect on differences 'between' Whites and Blacks. If so for environmental generalization, why not for genetic generalization?

What Gould especially fails to mention is the striking and critically important finding that 'genetic weights on IQ subtests predict racial differences'. Although the White/Black IQ gap averages 15 points, the difference 'is more pronounced on subtests that are highly heritable within races than it is on less heritable tests' (Jensen, 1985, Rushton, 1989b). This observation is important because it provides a test of differential predictions. Environmental theory predicts that racial differences will be greater on more culturally or environmentally influenced tests whereas genetic theory predicts they will be greater on more heritable tests. Because higher heritabilities are stronger indicators of underlying genetic substrates than are lower heritabilities, the data support the genetic hypothesis, not Gould.

It is in fact an important 'empirical' question whether heritabilities for Blacks are the same as, or different from, those for Whites. Reason alone tells us that as environments become more benign and more equal, genetic sources of variation will become larger. For example, over the last 50 years, as environmental barriers to health and educational attainment have fallen, the variance in health and educational attainment accounted for by genetic factors has increased (Scriver, 1984; Heath et al., 1985). In animal studies, low heritabilities for body size variables are typically interpreted as showing the suppressant effect of the environment on natural growth (e.g. Larsson, 1993). The relevant question thus becomes: 'Are IQ heritabilities for Blacks lower than those for Whites?' Most of the evidence favors the view of equal heritabilities across the three major races. There is, however, some evidence of lower heritabilities in Blacks which would support the hypothesis of a more damaging environment. For example, Rushton and Osborne (1995) studied cranial capacity in several hundred Black and White twins and found a range of higher heritabilities (depending on corrections for age and body size) for Whites than for Blacks (47% to 56% vs 12% to 31%). The differences, however, were not statistically significant. These are, however, precisely the kinds of analyses Gould should be conducting if he wants to make a scientific, rather than a political argument about heritability!

Most transracial adoption studies also provide evidence for the heritability of racial differences in IQ. Studies of Korean and Vietnamese children adopted into White American and white Belgian homes have been conducted (Clark & Hanisee, 1982; Frydman & Lynn, 1989; Winick et al., 1975). As babies, many adoptees had been hospitalized for malnutrition. Nonetheless, they went on to develop IQs 10 or more points higher than their adoptive national norms. By contrast, Black and Mixed-Race (Black/White) children adopted into White middle class families typically perform at a lower level than similarly adopted White children. For example, in the well known Minnesota Adoption Study, by age 17, adopted children with two White biological parents had an average IQ of 106, adopted children with one White and one Black biological parent had an average IQ of 99 and adopted children with two Black biological parents had an average IQ of 89 (Weinberg, Scarr & Waldman, 1992).

The only adoption studies Gould refers to (p. 370) are those showing IQ gains of very young Black children adopted into affluent and intellectual homes (presumably based on an earlier account of the Minnesota study when the children were only 7 years old) and a study of

prepubertal mixed-race German children fathered by Black soldiers compared with those fathered by White soldiers which found 'no difference'. But these apparent exceptions may 'prove the rule'. In general, behavior genetic studies show that as people age, trait heritability increases while environmentality decreases. Differences not apparent before puberty often emerge by age 17.

Evolutionary Selection: What Gould Doesn't Want You To Know

Given that Gould doesn't believe that either brain size or intelligence differ by race and sex it is not surprising that he offers no evolutionary explanations for the origins of these differences. Gould (p. 399) acknowledges the accumulating evidence in favor of the 'Out of Africa' model of human origins. It holds that *Homo sapiens* arose in Africa 200,000 years ago, exited Africa with an African/non-African split about 110,000 years ago, and migrated east with a European/East Asian split about 40,000 years ago (Stringer & Andrews, 1988). But, Gould refuses to acknowledge any relationship between this evolutionary sequence and the parallel rankings of major racial groups in behavioral traits. Nor does he tell his readers that evolutionary selection pressures were different in the hot savanna where Africans evolved than in the cold Arctic where East Asians evolved.

Rushton (1995b) and others have proposed that the farther north the populations migrated, out of Africa, the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children during prolonged winters. Consequently, as the original African populations evolved into present-day Europeans and East Asians, they did so by moving in the direction of larger brains and greater intelligence, but also towards slower rates of maturation, lower levels of sex hormone, and concomitant reductions in sexual potency and aggressiveness, and increases in family stability and social conformity.

Such an evolutionary scenario fits the data from Rushton's (1995b) review of the international literature on race differences which found that on more than 60 variables Orientals and Africans consistently averaged at opposite ends of a continuum with Europeans averaging intermediately. For example, the rate of dizygotic twinning based on a double ovulation is less than 4 per 1,000 births among East Asians, 8 among Europeans, and 16 or greater among Africans. Multiple birthing is known to be heritable through the race of the mother. No known environmental factor can explain why Africans average the smallest brains and the highest twinning rates, East Asians average the largest brains and the lowest twinning rates, and Europeans average intermediately in both. Clearly, there is a need for a genetic-evolutionary explanation.

In fact, Vincent Sarich, who helped initiate the research program on biochemical taxonomy from which the 'Out of Africa' model developed (Sarich & Wilson, 1967), argues that Gould got his evolutionary ideas about race completely upside down. As Sarich (1995, p.86) pointed out, "it is the Out of Africa model, not that of regional continuity, which makes racial differences more functionally significant. It does so because the amount of time involved in the riation process

is much smaller, while, obviously, the degree of racial differentiation is the same -- large. The shorter the period of time required to produce a given amount of morphological difference, the more selectively important the differences become." Sarich (1982, 1995) has labeled the argument that natural selection would result in geographically separated populations evolving the exact same brain size 'behavioral creationism'. Although Gould is comfortable talking about the evolution of different body types in humans, he often writes as though he believes that societies, cultures, and mental differences spring into being full-blown, as if from the brow of Zeus or the hand of God.

With respect to the evolution of sex differences in brain size, Ankney (1992, 1995) hypothesized that differing roles of men and women during human evolution produced a sexual divergence in brain size and in abilities. Men roamed from the home base to hunt, which would select for targeting ability and navigational skills; women were relatively sedentary. Such additional abilities would have selected for relatively larger brains in men as it may require more brain tissue to process spatial information. Lynn (1994b) has also proposed that men evolved larger (more costly) brains because they enhance their probability of becoming socially dominant and thus more reproductively successful; female reproductive success is much less dependent on social status.

Conclusion: Case Closed

Others have speculated on the extent to which Gould's political outlook has colored his scientific work (Davis, 1986; Dennett, 1995, Ruse, 1993). In *Darwin's Dangerous Idea*, Dennett (1995) brilliantly documents how Gould has been systematically misleading his readers for decades, attempting to smuggle anti-Darwinian mechanisms into evolutionary theory with a lot of clever talk of "spandrels" "punctuated equilibrium", and "dialectical processes". Gould notwithstanding, Darwinian adaptation is the way evolution works and the mechanism on which working evolutionary scientists base their research programs.

Gould himself tells us (1996, p. 19) that he originally considered titling his book *Great Is Our Sin* from Charles Darwin's remark: "If the misery of the poor be caused not by the laws of nature, but by our institutions, great is our sin." Gould avers that the scientific study of human differences in mental ability is nothing but an apology for elitist European enslavement and oppression of the rest of the world -- so it was in the beginning, is now, and ever shall be, world without end, amen. This has become the Apostle's Creed of the Adversary Culture. (Do not blame criminals from poor backgrounds, they are but helpless victims of a wicked system; affirmative action and multiculturalism must be invoked to exorcise the demons of capitalist oppression, racism, and sexism). In Gould's (1996) benediction, he keeps the faith of "political correctness", while grudgingly confessing that many see it as "leftist fascism" (his words, p. 424).

In his preface, Gould describes his background and how it has affected his work. All his

grandparents were Eastern European Jews whose entry into America, he believes, Goddard "would have so severely restricted" (p. 38). Thus the book is dedicated to "Grammy and Papa Joe, who came, struggled, and prospered, Mr. Goddard notwithstanding". Gould's father fought for the leftist International Brigade in the Spanish Civil War (p. 39). He himself actively campaigned against racial oppression in the U.S.A. and in England (p. 38). I for one admire Gould for having the candor to divulge this background. No doubt personal experience affects all scholarship (including mine). However, even the most deeply held values cannot justify withholding evidence, engaging in character assassination, and repeating unfounded charges despite published refutations.

No doubt we are all prisoners of our background as well as slaves to our genes, but facts remain facts. Brain size and IQ are correlated. Men do average larger and heavier brains than do women. Asians and Europeans do average larger and heavier brains than do Africans. Higher SES groups do average larger and heavier brains than do lower SES groups.

Perhaps more than any scientist in recent memory, Gould has wielded his influence not only as a professor of science at Harvard but also through the pages of the New York Review of Books and through broadcasts on educational television, to seriously and intentionally misrepresent the science and politics of IQ. By his own standard, Gould has consigned himself to the innermost circle of hell. But science, fortunately, is not religion or politics. Gould need only own up to the facts and end his career of relentless special pleading. The second edition of *The Mismeasure of Man* does not measure up to Gould's own standard of "honest assessment and best judgment of evidence for empirical truth".

A Substantial Inheritance

By Daniel Seligman

from National Review, October 10, 1994

As a result of genetic research, human nature is making a comeback.

Hereditarianism is on the march. Nature is clobbering nurture. A steady drip, drip, drip of scientific studies is cumulatively telling us that more and more human traits are genetically influenced. Some of the findings are based on studies of twins and adoptions; others have been generated by research in molecular biology and related hard sciences. The media have shown a particular interest in recent data linking genes to sexual orientation, alcoholism, violent and criminal behavior, and obesity, not to mention cheating on wives. "Infidelity: It may be in our genes," proclaimed the August 15 Time cover. The cover story, by Robert Wright, was based on his new book, *The Moral Animal: Evolutionary Psychology and Everyday Life*, a work heavily influenced by the science of sociobiology — which has also generated a lot of data linking genes to human behavior.

Some of the nature - nurture news stories also touch on IQ, although you would have difficulty deducing from the coverage that in this area there has been no serious dispute for decades about a powerful genetic effect. The August 9 Boston Globe — which was bracing its readers for *The Bell Curve: Intelligence and Class Structure in American Life*, by Richard J. Herrnstein and Charles Murray (to be published in October) — had a headline that could have appeared forty years ago: "IQ Fight Renewed; New Book Links Genes, Intelligence."

Curiously unnoticed by the reporters and anchorpersons of America is my own favorite finding of recent years: that political beliefs are strongly influenced by genes. The finding, exhaustively documented in the twin study program at the University of Minnesota, asks you to imagine a continuum of political attitudes. At one end are instinctive conservatives, here conceived as people who tend to respect traditional values and established authority; at the other end are rebellious types generally inclined to kick over the traces. One's place on this continuum is established by responses to a battery of questions gauging attitudes toward conservatism. It turns out that the test scores of identical twins (who are, of course, genetically indistinguishable) correlate far more closely than do the scores of fraternal twins (who have only about half their genes in common), even when the identical twins were reared apart and the fraternal twins were brought up together in the same household.

The media's rendering of the news about genes has been uneven, incomplete (especially in dealing with male - female differences), and maddeningly misleading in major respects. Still, there is no doubt that the literate public has been assimilating a few large truths: that genes play a greater role in human behavior than previously posited; that human beings are somewhat less malleable than had been assumed; that human nature is making something of a comeback.

Onward to Utopia

THE centrality of human nature, a.k.a "instinct," was received wisdom in psychology and anthropology early in this century. It was very much onstage in the world's first serious psychology textbook, William James's *Principles of Psychology* (1890), a work that drew heavily on Darwinian parallels between human and animal behavior. The Darwinian paradigm remained dominant for many decades.

By mid century, however, this model was pretty much undone in the realm of ideas. It was fighting Marxism and Freudianism, whose alternative visions both featured human behavior shaped by the environment. In addition, the master-race version peddled by the Nazis had made hereditarianism much harder to defend. It was gradually supplanted by a commitment to one or another form of cultural determinism. In *Search of Human Nature*, by Carl N. Degler of Stanford, traces the rise of this new model to anthropologist Franz Boas, who had been assailing hereditarian ideas as early as 1910 and whose students and disciples increasingly nudged the thinking classes toward a model of human development in which "culture," rather than biology, was supreme. By the 1950s, anthropologist Ashley Montagu was proclaiming that man "has no instincts, because everything he is and has become he has learned, acquired, from his culture." In 1961 the president of the American Sociological Society hailed "the new optimism," identified as a conviction that "anybody can learn anything."

This expansive view of human malleability was exactly what numerous social engineers were eager to hear in the Sixties, and it still lingers in high-minded rhetoric about educational reform. In 1987, when he was the chief executive of Xerox, David Kearns made a speech calling for " a new national agenda" and proposing, incredibly, that "every student — without exception — should master a core curriculum equivalent to college entrance requirements." Possibly owing to his utopian credentials, Kearns later became deputy secretary of education in the Bush Administration.

Adapting to the era of limited malleability has not been easy for the media. First, there has been endless confusion about and misrepresentation of the data. One keeps reading that the evidence points to homosexuality being "immutable, not a personal choice" (Los Angeles Times), or that "sexual or-ientation is innate" (New York Times), or that it is "biologically determined" (Boston Globe). Or, when the subject is data pointing to genetic and biochemical markers for violent behavior, that "biology is destiny" (Time). Or, in news stories about a hereditary basis

for obesity, that a particular gene "is the cause of" compulsive eating (St. Louis Post-Dispatch).

The principal difficulty with all these formulations — in some cases, they are hedged or qualified elsewhere in the article I am quoting — is that none of the data now emerging postulates any such determined outcomes. The news is about probabilities, not about "destiny." In every case the data concern genetic effects that "predispose" one in this or that direction and thereby change the odds of particular outcomes. They represent new estimates of the "heritabilities" involved in the trait. The heritability of obesity, for example, is apparently somewhere around 0.40, meaning that 40 per cent of the population's variability in body weight is attributable to genes, leaving 60 per cent for environmental effects. (Obesity is generally defined as 20 per cent or more overweight in relation to height and body type.) For homosexuality the heritability may be as high as 0.50. Some scholars say it is in about the same zone for alcoholism. (Others are profoundly skeptical of any genetic influence at all in alcoholism.) For political attitudes it is about 0.60, a figure raising the question of whether ideological sperm banks are just over the horizon. For IQ the heritability is even higher, by some measures as high as 0.80.

A second, related problem with the press coverage is its insistent politicization of the data. Over and over again, one sees the media spin doctors gravitating to questions about the political implications of the news: whether it is good or bad for this or that politically correct cause, and, if bad, whether such research should be continued.

This was particularly the case with data suggesting a biological basis for violent crime. The existence of such data has been documented in many different ways. Studies have repeatedly shown identical twins to be more alike than fraternal twins in various measures of criminality. It is clear that several traits associated with violent criminals — muscular physique, low IQ, and impulsiveness — are strongly influenced by genes. Dr. Markku Linnoila of the National Institutes of Health has spent many years building a data base relating deficiencies in serotonin (a brain-based chemical that facilitates transmissions between neurons) to impulsive violent behavior, and almost nobody doubts he is on to something.

The Nazi Tradition?

THE BIG issue about such studies nowadays is not so much their validity as the permissibility of pursuing them at all. The hangup here is racial:

Justice Department data indicate that blacks, who represent about 12 per cent of the U.S. population, commit about half of all violent crimes (defined as murder, non-negligent manslaughter, rape, aggravated assault, and robbery). Which raises the prospect that any research into the genetic and/or biological roots of violent crime would at some point be addressing differences in racial propensities. Numerous scholars are determined that no such research be done, and scholars wishing to do it are endlessly told that they are acting in the Nazi

tradition.

Prominent among those making such points is Dr. Peter Breggin, founder of the Center for the Study of Psychiatry, who was recently quoted in the *Atlanta Journal and Constitution* as concerned that the research would turn into a witch hunt against inner-city black kids. He added: "For America to suggest that the problem lies in them is hypocritical and evil, and to think of doing genetic studies in our inner cities is very close to the Nazi philosophy of blaming and oppressing the victim." Two years ago, the NIH was supporting a conference, to be held at the University of Maryland, on genetic factors in crime. Breggin howled, as did the Congressional Black Caucus. NIH Director Bernadine Healy instantly caved, and the conference was never held.

Political correctness has also been onstage in coverage of the data on gays. In this instance, however, there have been no demands for suppression of the data, which the gay-rights movement generally finds congenial. The new findings here have mainly been identified with two researchers. One is neurobiologist Simon LeVay, who in 1991, when he was at the Salk Institute in La Jolla, reported that a particular cell cluster in the hypothalamus was smaller in gay men than in straight men. The other is Dean Hamer of the National Cancer Institute, who reported in *Science* last year that he had found differences in the DNA of gay and straight men. Both LeVay and Hamer have repeatedly stated that their research does not point to a "gay gene" and does not imply that homosexuality is determined before birth.

Why, then, would so many media accounts create the opposite impression? Doubtless a contributing factor is the difficulty so many newsrooms have in dealing with complex quantitative data. But I believe that the main reason is political: the concept of a predetermined sexual orientation offered irresistible polemical opportunities to PC editorialists. For openers, it gave them a chance to beat the "Radical Right" over the head. If evangelicals say that homosexuality is "immoral," that must mean they believe gays have a choice in their sexual orientation. So it would be nice to argue that no choice is involved — gayness, no less than straightness, is a God-given trait. As elaborated by a *Boston Globe* editorialist: "The arguments of homophobes usually imply that homosexuals are somehow making a perverted choice. But the findings of Hamer's team . . . would tend to show that homosexuality . . . is biologically determined. . . . It could ease the struggle to secure equal protection for all Americans, regard less of sexual orientation."

The notion of a biologically determined sexual orientation had another attractive implication for progressive journalists. It meant that parents could no longer rationally defend their objections to gay influences in their children's lives. As *Time* argued in an article a year ago (July 26, 1993): "Parents might be more relaxed about allowing children to have gay teachers, Boy Scout leaders, and other role models, on the assumption that the child's future is written in his or her genetic makeup." Note, however, that this case crumbles fast as we move from biologically determined outcomes to mere tendencies. If a boy had any predisposition to gayness, his parents

would possibly be more concerned about gay Scoutmasters than if they had never heard of the new research.

An amusing footnote to these arguments emerged from some comments made by Dean Hamer at last winter's San Francisco meeting of the American Association for the Advancement of Science. At a news conference, Hamer expressed concern about one possible application of his research. He raised the possibility that the findings would lead eventually to prenatal tests for the predisposition to homosexuality, worried that some parents might elect to abort any fetuses at risk of being gay, and said he hoped to patent the gene in question and prevent homophobic parents from misusing his research. His position was widely reported, and applauded, and my search in Nexis turned up a non-amazing non-event. There were no editorials saying Hamer's plan was in conflict with a woman's right to abort unwanted pregnancies.

'Anything You Can Do . . .'

POLITICAL agendas are also discernible in the media treatment of data on male - female differences. The press has done fairly well at rendering the work of Harvard psychologist Carol Gilligan — Nexis was recently offering 547 articles that mention her — and especially the core concepts of her book *In a Different Voice*, which portrays women as far more empathetic and "caring" than men. This thought, which had arguably occurred to your grandmother long before Professor Gilligan got around to it, has now been assimilated by most feminist thinkers. But the media and modern feminism are still rigidly rejecting the avalanche of data depicting basic differences in male and female intellectual skills.

A striking instance of the rejection was the colossally uninformed coverage of the lawsuit last winter in which the American Civil Liberties Union and the National Center for Fair & Open Testing called upon the U.S. Department of Education to declare the Scholastic Aptitude Test in violation of Title IX of the Education Amendments of 1972, which bars sex discrimination in federally funded education. The suit's basic proposition: that the SAT (the name has been changed, so that the "A" now stands for Assessment) obviously discriminates against young women. Principal evidence: that women represent 55 per cent of the high-school juniors taking the preliminary SAT but only 40 per cent of those whose test scores qualify them for National Merit Scholarships. To qualify, you have to be above the 98th percentile of the testees.

A thought that was almost impossible to find in media coverage of this event was that this is precisely what serious students of male - female differences would have expected. There is broad (not quite total) agreement that men and women are on average equal in mental ability: they have different strengths and weaknesses, with a huge advantage for men in spatial abilities, which are deeply implicated in mathematical talent, and an offsetting verbal advantage for women. Camilla Benbow of Iowa State University is among the numerous scholars who believe these differences have a biological basis.

If the sexes are on average equal in ability, why would men be dominant among the National Merit Scholarship winners? Because in virtually all mental domains, males are more variable than females, i.e., the distribution of their scores is less bunched around the mean. David Lubinski of Iowa State and Professor Benbow, two prominent researchers who have studied the variability issue, have analyzed the test scores of several hundred thousand high-school students and concluded that even in domains where females have a higher average, males will be more variable. Obvious implication: in any sizable group of gifted (or retarded) students, you would expect males to be overrepresented.

I said above that it was "almost impossible" to find this thought in the media. In fact, I stumbled upon it in only one place: in a publictelevision discussion program called *To the Contrary*. The program has only female discussants, and on the day I tuned in one of them was Linda Chavez, who said that the National Merit Scholarship results were not surprising, since the greater male variability was well established. To be sure, Miss Chavez is a conservative and an occasional NATIONAL REVIEW contributor.

Taking everything together, the emerging limits-to-malleability perspective looks like better news to conservatives than to liberals. Down through the years, conservatives have almost always been less attracted to political initiatives — public housing, penal rehabilitation, the Job Corps, Head Start, international Communism — that were in some measure advertised as creating new and better kinds of human beings. Conservatives tend to be far gloomier than leftists and liberals in judging the possibilities of changing mankind. In *A Conflict of Visions*, published in 1987, Thomas Sowell argued persuasively that their different perspectives on human nature were fundamental to their disagreements on a wide range of public-policy questions. Contrasting the utopianism of the Left with the "constrained vision" of the Right, Sowell wrote: "What fundamentally distinguishes the two visions is their respective perceptions of human potential."

In the IQ debate, or at least that portion of it centering on the nature - nurture issue, conservatives have generally seemed quite comfortable with data running up the score for nature, possibly because the evidence confirms their intuitive doubts about so many ameliorative social programs. By the same token, strenuous resistance to the data tends to come from scholars on the Left. Typically they have been Marxists, Stephen Jay Gould of Harvard and Leon Kamin of Northeastern being among the more prominent. The single most hard-line statement against a genetic basis for IQ is still *Not in Our Genes*, a 1984 work by R. C. Lewontin, Steven Rose, and Leon Kamin, who posit that IQ studies are a weapon employed by the ruling class to hold down the poor and minorities, and who seem unable to discuss the human condition without dragging in Marx, Engels, Feuerbach, and "revolutionary philosophers and practitioners like Mao Tse-tung." Kamin was one of the scholars turned to by the Boston Globe for its recent report on the Herrnstein - Murray book. He was quoted as stating that the book was "politics masquerading as science."

Guaranteed: no shortage of politics as the gene data unfold.

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The Role of Inheritance in Behavior

Robert Plomin

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BEHAVIOR IS A NEW FRONTIER FOR MOLECULAR BIOLOGY. IT is the most complex phenotype that can be studied because behavior reflects the functioning of the whole organism and because it is dynamic and changes in response to the environment. Indeed, behavior is in the vanguard of evolution for these very reasons. Genetic analysis of behavioral dimensions and disorders is especially difficult for three additional reasons. First, unlike characteristics that Mendel studied in the edible pea such as smooth versus wrinkled seeds, most behaviors and behavioral problems are not distributed in "either/or" dichotomies--we are not either smooth or wrinkled, psychologically. Second, unlike classic Mendelian disorders such as Huntington's disease that are caused by a single gene with little effect from other genes or environmental background, most behavioral traits appear to be influenced by many genes, each with small effects. Finally, behavior is substantially influenced by nongenetic factors.

In this article, I will provide an overview of the results of quantitative genetic research on behavior with a focus on the multigenetic control of behavior and the magnitude of genetic influence and, second, will consider the implications of these findings for the application of molecular biology techniques to the investigation of behavior. But the question must be asked at the outset, why should scientists bother with behavior if it is so complex? The answer lies in the importance of behavior per se rather than in its usefulness for revealing how genes work. Some of society's most pressing problems, such as drug abuse, mental illness, and mental retardation, are behavioral problems. Behavior is also key in health as well as illness, in abilities as well as disabilities, and in the personal pluses of life, such as sense of well-being and the ability to love and work.

Although the effects of major genes and chromosomal abnormalities on behavior are sometimes studied, most genetic research on behavior employs the theory and methods of quantitative genetics. Quantitative genetics identifies genetic influence even when many genes and substantial environmental variation are involved. This theory emerged in the early 1900s as a resolution to the problem of how Mendelian laws of inheritance could be applied to quantitatively distributed complex characteristics, such as behavior. The essence of quantitative

genetic theory is that Mendel's laws of discrete inheritance also apply to such complex characteristics if we assume that many genes, each with small effect, combine to produce observable differences among individuals in a population. Quantitative genetics also applies to behavioral differences among individuals dichotomized into affected and unaffected categories, as is typical in research on behavioral disorders.

Quantitative genetic research determines the sum of heritable genetic influence on behavior, regardless of the complexity of genetic modes of action or the number of genes involved. However, quantitative genetics does not tell us which genes are responsible for genetic influence. An exciting direction for genetic research on behavior is the identification of genes responsible for genetic variance on behavior, the theme of the second half of this article. In the first half of the article, I review results of quantitative genetic research on animal and human behavior. I hope to provide an overview that will be useful for researchers outside the field who might be interested in the role of inheritance in behavior. For details concerning the methods and results of animal and human behavioral genetic research, see [1].

Animal Behavior

Applied behavioral genetics began thousands of years ago when animals were bred for their behavior as much as for their morphology. The results of such artificial selection can be seen most dramatically in differences in behavior as well as physique among dog breeds, differences that testify to the great range of genetic variability within a species and its effect on behavior. Selection studies in the laboratory still provide the most convincing demonstrations of genetic influence on behavior. The results of two selection studies in mice, the favorite mammalian organism of behavioral geneticists, are depicted in Fig. 1. In one of the longest mammalian selection studies of behavior, replicated high and low lines were selected for activity in a brightly lit open, field, an aversive situation thought to assess emotional reactivity [2]. After 30 generations of selection, a 30-fold difference exists between the activity of the high and low lines, and there is no overlap between them. Similar results have been found for most mouse behaviors subjected to selection in the laboratory, such as alcohol sensitivity [3], preference, and withdrawal; various types of learning; exploratory behavior; nest building; and aggressiveness. Many behaviors of rats and *Drosophila* have also responded to selective breeding [1].

In addition to providing dramatic evidence of the existence of genetic influence on behavior, two other implications can be drawn from the results of these selection studies. The first concerns the magnitude of the genetic effect as measured by statistical tests. Heritability is a descriptive statistic that estimates the extent to which observed variability is due to genetic variability. In selection studies, heritability estimates derived from the magnitude of the response to selection are nearly always less than 50%. Even though genetic influence of this magnitude can result in major differences between selected lines after just a few generations of selection, most behavioral variability is not genetic in origin.

The second implication of these results is that many genes appear to affect behavior. Despite intense selection pressure, the response to selection continues unabated during the course of most selection studies of behavior. For example, in the study of open-field activity in Fig. 1, although the low-active lines have reached the bottom limit of zero activity scores, the high lines show no sign of reaching a selection limit, even after 30 generations of selection. If only one or two major genes were responsible for genetic effects on these behaviors, the relevant alleles would be sorted into the high and low lines in a few generations. The steady divergence of selected lines provides the best available evidence that many genes affect behavior.

Other genetic methods used to investigate animal behavior are family studies and studies of inbred strains. Family studies assess the sine qua non of transmissible genetic influence, the resemblance between genetically related individuals. They also provide test crosses that can be used to explore hypotheses of single-locus transmission. Hundreds of single-locus mutations have been found that result in neurological defects. For example, there is a gene responsible for head shaking and rapid circling in "waltzer" mice. However, normal behavioral variability has not shown the effects of one major gene.

Inbred strains are created by mating brother to sister for at least 20 generations. This severe inbreeding eliminates heterozygosity and results in animals that are virtually identical genetically. Behavioral differences between inbred strains reared under the same laboratory conditions can be ascribed to genetic differences. Similar to the results of selection studies, comparisons among inbred strains point to significant genetic influence on most behaviors that have been examined [1]. Also in line with selection studies, estimates of the magnitudes of genetic influence from comparisons among inbred strains indicate that, although substantial, genetic factors do not explain the majority of the variance in behavioral characteristics. Crosses and backcrosses between inbred strains and their progeny have been used to find patterns of inheritance consistent with single-gene transmission, but this approach in fact has little power to discriminate single-gene from multiple-gene transmission.

A powerful strategy to uncover major-gene effects in animal behavior is the recombinant inbred (RI) strain method [4]. RI strains are different inbred strains that were derived from separate brother-sister pairs from the same genetically segregating [F.sub.2] generation (crosses among hybrid offspring of two inbred strains). They are called RI strains because parts of chromosomes from the parental strains have recombined in the [F.sub.2] generation from which the RI strains were derived. If a single gene is responsible for a behavior that differs between the two parental strains, half of the RI strains should be like one parent and half like the other. In other words, there should be no intermediate phenotypes if just one locus is involved, because each RI strain will be homozygous for the allele of either one or the other parental strain. Behaviors studied in RI strains show no single-gene effect; a few, but only a few, major-gene effects have been suggested [1].

Human Behavior

For human behavior, no quantitative genetic methods as powerful as selection or inbred strain studies exist. Human behavioral genetic research relies on family, adoption, and twin designs. As in studies of nonhuman animals, family studies assess the extent of resemblance for genetically related individuals, although they cannot disentangle possible environmental sources of resemblance. That is the point of adoption studies. Genetically related individuals adopted apart give evidence of the extent to which familial resemblance is due to hereditary resemblance. Twin studies are like natural experiments in which the resemblance of identical twins, whose genetic identity can be expressed as genetic relatedness of 1.0, is compared to the resemblance of fraternal twins, first-degree relatives whose coefficient of genetic relatedness is 0.50. If heredity affects a behavior, identical twins should be more similar for the behavior than fraternal twins. As in studies of nonhuman animals, family, adoption, and twin studies can be used to estimate the magnitude of genetic influence as well as its statistical significance. For example, for height, an exemplar of a complex quantitative trait, correlations for first-degree relatives are 0.45, whether reared together or adopted apart, and identical and fraternal twin correlations are 0.90 and 0.45, respectively. These results suggest that heritability, the proportion of phenotypic variance that can be accounted for by genetic factors, is 90% for height.

Below I review results of family, twin, and adoption research on the role of inheritance in human behavior, emphasizing the focal areas of cognitive abilities and disabilities, personality, and psychopathology.

Cognitive abilities and disabilities. One of the most studied traits in human behavioral genetics is general cognitive ability (IQ). In more than 30 twin studies involving more than 10,000 pairs of twins, identical and fraternal twin correlations averaged 0.85 and 0.60, respectively [5]. The IQ correlation for first-degree relatives living together is about 0.40; for adopted-apart first-degree relatives, the correlation is about 0.20; and for adoptive parents and their adopted children, the correlation is about 0.20. These results, and model-fitting analyses that incorporate all of the data on IQ are consistent with heritabilities of about 50% [6]. The error surrounding this estimate may be as high as 20%, so we can only say with confidence that the heritability of IQ scores is between 30 and 70%. Nonetheless, even if the heritability of IQ scores is at the bottom of this range, it is a remarkable finding. To account for 30% of the variance of anything as complex as IQ scores is a remarkable achievement.

One direction for research on IQ is to trace the unfolding of genetic influence during development [7]. For example, for 15 years, my colleagues and I have been engaged in a prospective longitudinal adoption study of over 200 adoptive and 200 matched nonadoptive families in which adopted and nonadopted children are studied yearly [8]. For IQ model-fitting analyses indicate that heritability increases steadily from infancy to the early school years [9] and also suggest that genetic effects on IQ during childhood are highly correlated with genetic

effects on IQ in adulthood [10].

Specific cognitive abilities such as verbal ability and spatial ability show as much genetic influence as IQ; some types of memory ability appear to be less influenced by heredity than other specific cognitive abilities [11]. Measures of academic achievement also show genetic influence, and recent multivariate research suggests that genetic effects on academic achievement tests correlate highly with genetic effects on cognitive abilities [12]. Surprisingly, there are not twin or adoptions studies of mental retardation.

There is no evidence for major-gene effects on normal variation in general or specific cognitive abilities. For example, earlier reports of sex linkage for spatial ability have not been confirmed [13]. Common cognitive problems such as reading disability have yielded no clear major-gene effects. For example, a 1983 report of chromosome 15 linkage for reading disability [14] is in doubt--only 1 in 21 families now shows a near significant lod score (logarithm of the likelihood ratio for linkage) [15]. However, as in mouse research, many rare genes have been identified that drastically disrupt normal cognitive development. Of the more than 4000 single-gene effects cataloged for human beings, more than a hundred include lowered IQ scores as a clinical symptom [16]. Although these recessive alleles may have devastating effects for homozygous individuals, they are rare and thus can account for only a minuscule portion of IQ variance in the population. For example, the fragile X marker, which appears to be a source of the excess of mild mental retardation in males [17], cannot account for much IQ variance in the population because its incidence is less than 1 in 1000 and many males with the fragile X marker do not show lowered IQ [18].

Personality. Twin and adoption studies that use personality questionnaires typically yield heritability estimates in the range of 20 to 50%. For example, identical and fraternal twin correlations are on average about 0.50 and 0.30, respectively. Activity level, emotional reactivity (neuroticism), and sociability-shyness (extraversion) have accumulated the best evidence for significant genetic influence [19]. For example, four twin studies in four countries involving over 30,000 pairs of twins yield heritability estimates of about 50% for neuroticism and extraversion [20]. Adoption studies of first-degree relatives suggest lower estimates of heritability for these traits than do twin studies--about 30% rather than 50%. This may be due to nonadditive genetic variance (especially higher order interaction among loci, called epistasis), which varies completely for identical twins but contributes little to the resemblance of first-degree relatives [21].

For the past decade, my colleagues and I have conducted a large-scale behavioral genetic study in the last half of the life-span: a Swedish study of hundreds of pairs of identical and fraternal twins reared apart and matched twins reared together. The results of this study support the hypothesis of nonadditive genetic variance for personality and also suggest that heritability of these traits may be somewhat lower, about 30%, later in life [22]. As in the case of cognitive abilities, there is no evidence for major-gene effects on personality.

Psychopathology. A third major domain of behavioral genetic research is psychopathology. In the past, most research focused on schizophrenia; attention has now turned to the affective disorders, which include major depressive disorder and manic-depressive disorder.

In 14 studies involving over 18,000 first-degree relatives of schizophrenics, their risk was 8%, eight times greater than the base rate in the population [23]. Twin and adoption studies suggest that familial resemblance for schizophrenia is due to heredity rather than to shared family environment. For example, the most recent twin study involves all male twins who were veterans of World War II [24]. Twin concordances were 30.9% for 164 pairs of identical twins and 6.5% for 268 pairs of fraternal twins. Adoption studies of schizophrenia support the twin findings of genetic influence [23]. Although these data suggest that inheritance plays a major role in schizophrenia, the same data also indicate that nongenetic factors are of critical importance as well. A risk of 30% for an identical co-twin of a schizophrenic far exceeds the population risk of 1%, but it is a long way from the 100% concordance expected if schizophrenia were entirely a transmissible genetic disorder. There is no way to explain such substantial discordance for identical twins for schizophrenia as currently diagnosed other than by nongenetic factors.

Genetic effects on schizophrenia appear to be independent of genetic effects on the affective disorders. Furthermore, unipolar depression may be distinct genetically from bipolar manic-depressive disorder [25]. The most recent family study of unipolar depression involved 235 probands with major depressive disorder and their 826 first-degree relatives [26]. Major depression was diagnosed for 13% of the male relatives and for 30% of the female relatives, which exceed the base rate in the population. The familial risk for bipolar illness is lower, 6% in eight studies of 3000 first-degree relatives of bipolar probands, with no gender differences in risk, as compared with a risk of 1% in a control sample [27]. Twin results for affective disorders suggest greater genetic influence than for schizophrenia, but adoption studies indicate less genetic influence [28]. In the most recent adoption study, affective disorders were diagnosed on only 5.2% of biological relatives of affectively ill adoptees, although this risk was greater than the risk of 2.3% found in the biological relatives of unaffected adoptees [29].

Psychopathology was the first behavioral domain for which major-gene linkages were reported with restriction fragment length polymorphisms (RFLP) markers. In 1987, bipolar manic-depressive disorder was reported to be linked to a dominant gene on the short arm of chromosome 11 in an Amish pedigree of 81 individuals, 19 of whom were affected [30]. However, the Amish results have essentially been withdrawn [31]: Follow-up work on the original Amish pedigree yielded two new diagnoses of manic-depressive disorder, which reduced the evidence for linkage to nonsignificance, and an extension of the original pedigree also failed to replicate the original result. Manic-depression may be linked to the X chromosome in some families, despite the frequent occurrence of father-son transmission, which rules out a major X-lined gene for manic-depressive illness in the population [32].

For schizophrenia, linkage to a dominant gene on chromosome 5 was reported in 1988 for five Icelandic and two English families with a high incidence of schizophrenia [33]. Several failures to replicate the linkage have been reported [34], and as yet no positive replication has appeared.

Molecular Biology and Behavior

This overview of behavioral genetic research suggests that genetic influence is nearly ubiquitous for both animal and human behavior. However, these same data lead to two additional conclusions with important implications for the application of molecular biology techniques to the investigation of behavior: Genetic influence on behavior appears to involve multiple genes rather than one or two major genes, and nongenetic sources of variance are at least as important as genetic factors. This suggests the need for molecular biology strategies that can detect DNA markers that account for small amounts of behavioral variation.

If this view is correct, current linkage studies--including the large-pedigree approach as well as the affected-sib-pair method [35]--will not succeed in identifying linkage because they can only detect major-gene effects in which one gene is largely responsible for a behavioral disorder. Linkage is a powerful strategy for identifying the chromosomal location of a disorder caused by a single gene that has its effect regardless of environmental or genetic background, as in Huntington's disease [36]. However, replicated linkages have not been demonstrated for human behavior, despite claims for linkages in manic depression and schizophrenia. Attention has shifted to the possibility that certain families may have their own unique major gene responsible for a disorder (genetic heterogeneity). In this view, multiple-gene influence is seen in the population because of the concatenation of different major genes in different families. Failure to find major-gene effects on complex characteristics in plants and animals and the absence of major-gene linkages to date for human behavioral variation does not prove that linkages will not be found. Only a small portion of the genome and only a few families have been examined for such linkages. Linkages may be found during the coming decades because closely spaced markers are available for nearly all human chromosomes; however, this will also make it possible to exclude linkage for behavior. I predict that such exclusions will eventually provide the best evidence that human behavior and behavioral disorders are not due to major genes. This should not be interpreted to mean that genes do not affect human behavior; it only demonstrates that genetic influence on behavior is not due to major-gene effects.

An alternative hypothesis is that genetic influence on behavior is not due to a major gene in the population or in a family. That is, for each individual, many genes make small contributions toward behavioral variability and vulnerability. Nonetheless, some rare major-gene effects may be found in some families, just as hundreds of rare single-gene mutations have been found that cause neurological defects in mice and more than a hundred rare alleles are known for human beings that drastically lower IQ scores in affected individuals. This suggests an important principle: Although any one of many genes can disrupt behavioral development, the normal range of behavioral variation is orchestrated by a system of many genes, each with small

effects.

Rare alleles that disrupt behavioral development are probably just the most easily noticed tip of the iceberg of genetic variability. It seems reasonable to expect that many more alleles nudge development up or down and do not show such striking single-gene effects on a few individuals. It is not the case that we are identical genetically with the exception of major mutational flaws: Many loci are polymorphic and many of these are likely to contribute to variability in behaviors as complex as cognitive abilities and in behavioral disorders as complex as schizophrenia.

Applications of molecular biology techniques to the study of behavior are unlikely to succeed if they need to assume that a major gene is largely responsible for genetic variation. Behavior is not too complex for molecular biology; strategies are needed to identify genes that account for a small amount of variance.

If this quantitative genetic view of behavior is correct, we need to find many tiny needles in the haystack. Research in plant genetics suggests that a very large number of genes with very small effects are responsible for genetic influence on complex characteristics. For example, the results of a study of associations between 20 electrophoretic genetic markers and 82 quantitative traits in maize [37] can be summarized as follows: (i) Significant associations were found for each of the 82 quantitative traits; (ii) the maximum variance of any quantitative trait explained by a single marker was 16%; (iii) more than half of the significant associations accounted for less than 1% of the trait variance; (iv) only 5% of the marker loci accounted for more than 5% of the variance; and (v) in concert, the genetic markers predicted between 8 and 37% of the variance of a subset of 25 relatively independent traits, which is most of the genetic variance for these traits.

Such association studies may be useful in finding the needles in the haystack because sample sizes can be increased to provide sufficient power to detect associations that account for small amounts of variance. Association, usually called linkage disequilibrium, refers to covariation between allelic variation in a marker and phenotypic variation among individuals in a population. The use of genetic markers to study associations with complex traits is not new [38]; the first association between genetic markers and quantitative traits was found more than 60 years ago [39]. Many associations were reported even before the widespread use of RFLP markers [40]. However, this approach is greatly enhanced by the increase in available markers that permits quantitative trait loci (QTL) interval mapping--appraisal of associations with many closely spaced RFLPs simultaneously by the use of the interval between markers rather than the markers themselves [41]. With this method, six QTL were identified that together accounted for 58% of the variance of fruit mass in a backcross between a domestic tomato and a wild green-fruited tomato.

Research of this type uses crosses between inbred strains because their chromosomes have

segregated as units broken up only slightly by recombination. As a result, a genetic marker indexes a region of millions of base pairs. In contrast, in outbred populations including humans, many generations of recombination have eliminated linkages between alleles on the same chromosome so that the range of a marker is limited to a very small stretch of DNA not broken up by recombination, probably no more than a few hundred thousand base pairs. For this reason, trying to find associations between markers and human behavior is very much like trying to find needles in a haystack. Nonetheless, a blood marker (HLA A9) has been found that appears to be associated with paranoid schizophrenia [42]. Perhaps because the marker accounts for only a small portion of variance, linkage studies have not yet found evidence for linkage between the marker and schizophrenia.

Instead of using random RFLPs to look painstakingly through the human genome, a more efficient initial strategy may be to screen candidate genes with known function, especially genes suspected to be involved in neurological processes, for their individual and joint contributions to behavior [43]. For example, an association has recently been found between alcoholism and alleles of the aldehyde dehydrogenase locus [44]. However, association studies of common disorders such as heart disease and diabetes indicate that this approach is not a panacea.

Although association studies using very large samples might begin to uncover some QTL, success in identifying all of the many genes responsible for genetic variance for a particular behavior is likely to depend on the development of new techniques. It may not be overly optimistic to expect such developments given the pace of advances in molecular biology [45]. For example, it may be possible to use new modifications of subtractive hybridization [46] to identify genes that differ between groups or even between individuals, yielding a set of trait-relevant DNA sequences that could be used as markers in association studies. The human genome project is another example. One of the many benefits of the project will be the identification of more markers and genes that might play a role in genetic variation in behavior. In addition, the human genome project will no doubt foster technological spin-offs such as sequence-tagged sites which, with new developments in polymerase chain reaction techniques and automated sequencing equipment, make it possible to produce genetic markers from published sequence data without obtaining the DNA itself [47].

Conclusions

Just 15 years ago, the idea of genetic influence on complex human behavior was anathema to many behavioral scientists. Now, however, the role of inheritance in behavior has become widely accepted, even for sensitive domains such as IQ [48]. Indeed, acceptance of genetic influence has begun to outstrip the data in some cases, such as alcoholism [49]. For most domains of behavior, too few twin and adoption studies have been conducted to answer the basic question of whether genetic influence is significant. Only for a handful of behaviors is it possible to estimate effect size with reasonable certainty, estimates that one might expect to be prerequisite to exploring the relative importance of individual genes. More quantitative genetic

research is needed, too, because such research can go well beyond the basic question of the relative importance of nature and nurture. For example, new developments include multivariate analyses of the genetic covariance among behaviors or between biology and behavior, consideration of age-to-age change as well as continuity of genetic effects as they unfold during development, and exploration of the interface with the environment [1].

An equally important conclusion from behavioral genetic research must be emphasized: Nongenetic sources of variance are important because genetic variance rarely accounts for as much as half of the variance of behavioral traits. That is, evidence for significant genetic influence is often implicitly interpreted as if heritability were 100%, whereas heritabilities for behavior seldom exceed 50%. Another conclusion with far-reaching implications for molecular biology is the absence of evidence that genetic influence on behavior is primarily due to one or two major genes. It seems more reasonable to hypothesize that many genes each with small effect are involved.

If it is the case that behavioral variation involves many genes and much environmental influence, linkage analyses are unlikely to succeed in the population or even in a single family if they can only detect major-gene effects. New strategies are required that can isolate DNA markers associated with small amounts of variance. Quantitative genetic research will be important in this endeavor in order to assess the extent to which genetic variance accounts for phenotypic variance and the extent to which individual genes account for genetic variance.

In conclusion, the use of molecular biology techniques will revolutionize behavioral genetics, and the quantitative genetic perspective of behavioral genetics will transform our use of these techniques as we continue to explore the role of inheritance in the most complex of phenotypes, behavior.

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Thalamic Inhibition in the Evolution of Human Intelligence: Evolutionary Pressure for Cortical Inhibition

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One characteristic of a civilized society is the ability and propensity of its members to refrain from acting in a way that disrupts the harmony of the group. While this is not intelligence as measured by IQ, it is a form of social intelligence that will aid those having it in their ability to propagate. This characteristic is not unique to human societies but rather is true of most social species.

This report deals with one aspect of brain chemistry that may underlie this social intelligence, defined as the ability of a species to inhibit its thoughts as well as its behaviors. Selective pressure has unrelenting consequences on the mechanisms of brain function, and perhaps the first mechanism to be affected is the chemistry of the brain. Changes in brain chemistry and function can be explored by an investigation of species selected to represent the phylogenetic sequence leading to mankind. In an examination of nine species selected on this basis, we have found that one consequence of selective pressure is an increase in the potential for cortical inhibition. We suggest this may be a major component of the evolution of human intelligence.

Key words: intelligence, thalamus, inhibition, comparative psychology, evolution, mammals, receptor binding, GABA, muscimol binding, amniotic vertebrates.

By treating relative brain size as a measure of intelligence, it is possible to develop a coherent story about the probable history of intelligence as a biological phenomenon. Like other biological processes, intelligence must have evolved under the influence of natural selection. That is, a well known prime result of evolutionary pressure has been the selection for human intelligence.

The intelligence of humans has been shown to be correlated with an increase in size of the neocortex (eg., Ariens Kappers 1929; Diamond and Hall 1969). In this investigation we have extended this axiom one step further. Not only do humans have a larger cortex but we have found that humans also come equipped with an increased capability of inhibiting this expanded cortex.

To begin this investigation we began with the assumption that a look at our ancestral heritage gives us insight as to what the future may bring. In turn, an even broader spectrum of evolutionary analysis can lead to a similar insight and perhaps predictions about the path along which natural selection is taking us. That is, what lies ahead in the evolution of mankind is only

a subpart of what has been happening to primates as they are a subpart of what has been happening to mammals and so on. By an examination of diverse species chosen to represent a phylogenetic series leading to man, this report shows one step in the consequences of selective pressure on the mechanisms of brain function. Our conclusion is that this step, an increase in the potential for inhibition of the cortex, is probably a major component of the evolution of human intelligence.

To draw this conclusion we must first examine the results of selective pressure on brain development. Secondary and tertiary synaptic levels in brain structure are relatively immune to changes in a species ecological niche. Natural selection first acts upon those parts of the brain most easily changed so they can revert with changing circumstances. For example, a species driven into a nocturnal habitat is subject to adaptive pressure on its visual system to adapt. The first noticeable gross anatomical changes are the receptors in the eyeball (Polyak 1957). Prior to these anatomical changes are changes in the chemistry of the brain. These are the most easily changed and therefore the first to be effected by selective pressure.

Yet the chemistry of the brain demonstrates a remarkable robustness throughout phylogeny. In this study we have looked at the constancy of an inhibitory neurotransmitter in the brain over a wide range of species. Particular attention has been paid to a part of the brain, the dorsal thalamus, through which all sensory information is channeled before it reaches the cortex.

With the advent of modern neurochemical analysis, the notion of the dorsal thalamus as a 'relay' of sensory information to the cortex has given way to the notion that it is a 'gateway' to cortex. In this conception, neural activity directed to the forebrain is actively modulated by a variety of inhibitory feedback loops.

An evolutionary dimension to the intrinsic modulation by the dorsal thalamus can be traced to Ramon y Cajal (1909, 1966) who proposed that the number of interneurons in the dorsal thalamus increased during the course of the evolution of mammals. In man, then, our greater intellectual capacity may not be just a function of our cortex but also of our dorsal thalamus. Further, it seems that the dorsal thalamus gates the information getting to the cortex by inhibiting much of it. The idea that the interneurons in the dorsal thalamus are usually inhibitory has been demonstrated in studies showing that most neurons are g-aminodecarboxylase (GAD)-immunoreactive and that more GAD-immunoreactive interneurons are present in species 'higher' in an evolutionary sequence leading to humans (Penny et al.1983,1984).

In the present study, the idea of an increasing amount of g-aminobutyric acid-A (GABA-A) inhibition over the Anthropoid ancestral lineage was investigated using seven mammals and two non-mammals selected to yield at least 5 differing grades or levels of recency of last common ancestor with Anthropoids. Any commonality among these would be relevant to the prototype of our common ancestor. Moreover, any change in pattern could be used to predict the direction these selection factors will have on the evolution of brain chemistry.

These species, each subjected to exactly the same receptor-binding procedure, were compared for the relative distribution of muscimol bound GABA-A receptors among the four subdivisions of the diencephalon.

The results support the view that the presence of g-aminobutyric acid and its role in inhibiting neurons in the dorsal thalamus is probably a fundamental characteristic of amniotes changing only in amount during the later evolution of mammals. This has implications for an increasing role of inhibitory synapses in mammals, in primates, and perhaps most importantly to us, in humans.

Materials and Methods

The labeling of high-affinity GABA-A receptors was accomplished by conventional receptor binding methods.(eg, Glendenning and Baker 1988, Cole et al.,1984, Nauta and Karten 1970, Penney et al., 1981). Tritiated muscimol was used as the labeling ligand and GABA itself was used as the displacing agent for matched sections of control tissue (e.g., Snodgrass 1978)

For controls, myelin-stained material and binding of two other receptors (serotonin and muscarinic acetylcholine (ACh) was also performed to be sure that the pattern of muscimol binding among the diencephalic subdivisions was not merely the secondary result of differences in cell packing, neuropil density or total available membrane.

Sample Species

In all, 26 individuals from the 9 species were examined. Species were selected mainly on paleontological, taxonomic, and comparative anatomical grounds for their sequential recency of last common ancestry with Anthropoids (Fig. 1). This selection allowed the sample to contain mammals with at least 4 grades of successive kinship with Anthropoids: preplacental, two preprimate, and primate levels (e.g., Cronin and Sarich 1980, Dene et al., 1980, Luckett 1980, McKenna 1975, Szalay and Drawhorn 1980).

Therefore, the seven species of mammals which could be arranged on the basis of the remoteness of their last common ancestor with Anthropoids included *Monodelphis* and *Didelphis* opossums (*Monodelphis domestica*, *Didelphis virginiana*), armadillo (*Dasypus novemcinctus*), rat (*Rattus rattus*), tree shrew (*Tupaia glis*), bushbaby (*Galago senegalensis*), and lemur (*Lemur fulvus*; eg., Nudo and Masterton 1988).

To these seven mammalian species, two non-mammalian amniotes with unarguably remote common ancestry with Anthropoids were added to the sample: a reptile (*Iguana iguana*) and a bird (pigeon, *Columba livia*). Together, the total of nine species in the sample could be used to deduce at least 5 phylogenetic grades (numbered 0 through 4 in Fig. 1).

Measurement of Receptor Binding

Because of the wide variation in the dissociation constant (KD) for muscimol-binding, we performed standard statistical analyses of variance of the dissociation constants in 71 reports published over a 12 year period. Separate analyses, using 'laboratory of origin', 'tissue procedure', and 'species' as single factors showed that it was 'laboratory' alone which was the significant factor in the variation of KD values ($p < 0.0001$). The other two factors, 'tissue-procedure' and 'species' singly or with interactions yielded no significant variation (tissue-procedure, $p > 0.7$; species, $p > 0.8$; tissue-procedure x species, $p > 0.8$).

Therefore, we chose to standardize the procedure to be certain that the comparison of muscimol binding among the present species would not vary as a result of even minor variations. Consequently, the tissues from all 26 individuals in the 9 species were treated identically including exposure to exactly the same concentration of ligand.

The in vitro receptor-binding technique followed the protocol of Kuhar(1985) and his colleagues (Nauta and Karten 1970, Zarbin et al., 1981 and see Beaumont et al., 1978, Glendenning and Baker 1988, Shaw et al.,1984). For the control binding of serotonin receptors with serotonin and muscarinic ACh receptors with quinuclidinyl benzilate (QNB), the procedures of Pazos and Palacios (1985) and Yamamura and Snyder (1974), respectively, were followed. The individuals were routinely euthanized following the guidelines of the AVMA Panel on Euthanasia (1993).

Microdensitometry of the Tritium-sensitive Film

For each procedure, the sections were exposed to tritium-sensitive film along with autoradiographic tritium microscopes which were placed with the sections in the film-cassette (Geary et al.,1985). These microscopes allowed the optical density of the autoradiographic images produced by the bound ligand to be converted into relative densities.

Microdensitometric analysis was accomplished using a microcomputer imaging system (Imaging Research, Inc.). Following calibration, a 'total' binding image was digitized and then overlaid with the 'non-specific' binding image. The 'specific' binding image

was the difference between them. The tissue for analysis, i.e., dorsal thalamus, epithalamus, etc., was outlined on the 'specific' binding image of the thalamus and average relative optical densities were generated for each subdivision. The values shown in the tables and graphs are the averages of at least twelve photo-density measurements of each subdivision, six from each side of the brain.

Results

There are three chief results: 1) inhibitory receptors as shown by muscimol binding was far denser in the dorsal thalamus than in any other of the four major subdivisions of the thalamus for each of the 9 species; 2) the pattern of muscimol binding across the four thalamic subdivisions was similar regardless of the species' taxonomic class, subclass, order, or family; and 3) only the dorsal thalamus in the placental mammals suggested a systematic increase in muscimol binding over geological time. Since it is also known that phylogeny brings an increase in the development of cortex, the systematic increase in inhibitory receptors in the dorsal thalamus of placental mammals is correlated with the increase in the development of the cortex of placental mammals.

Muscimol Binding

In each of the seven mammals, a broad band of high-density binding was confined to dorsal thalamus.

The microdensitometric measurements of relative muscimol binding in each of the four subdivisions of the diencephalon is tabulated in Table I. It can be seen that the density of binding in dorsal thalamus always exceeded that in the other diencephalic subdivisions. It should be noted that there was also a relatively high density of bound muscimol in the dorsal thalamus of the non-mammals, although it was less dense than in the mammals (compare scaling of vertical axes in Fig. 2). Table I also shows that there was more bound muscimol in the entire diencephalon of the mammals than in that of the non-mammals.

The profiles of the relative density of muscimol binding across the 4 subdivisions, with dorsal thalamus arbitrarily standardized to 100%, are illustrated in Figure 3. It can be seen that the density of muscimol binding in the dorsal thalamus (the second bar of each graph) is far higher than the other three subdivisions of the diencephalon while binding in the hypothalamus is higher than in either epithalamus or ventral thalamus.

Although there was variation in binding among the several species of mammals, the relative density among subdivisions of the diencephalon was similar within each species: a dorsal to ventral, low-high-low-high profile was obtained regardless of species. Therefore, this generalized profile of bound muscimol across the diencephalic subdivisions may be a common characteristic of amniotic vertebrates, whether mammalian or not.

It should be noted that in order to produce comparable profiles of relative binding density among the species, the scale of optical density differs among the species (compare entries in Table I). This scaling, showing relative optical density rather than absolute numbers of receptors, allows comparison among the species despite possibly differing dissociation constants for muscimol.

Comparison of Profiles of Muscimol Binding with Other Ligands

Before pursuing some possible factors leading to the variation in levels of muscimol binding, it is noteworthy that two other receptor binding ligands did not show the same general pattern as that of bound muscimol.

That is, while the dorsal thalamus is heavily bound with muscimol, it is relatively free of 5-HT binding. Other data leading to the same conclusion were found in the binding of the other control ligand: QNB binding of mACh receptors also does not parallel the profile of muscimol binding. Taken together these two controls make it unlikely that the muscimol profile across the thalamus is based solely on the differences among the subdivisions in cell or neuropil density. Therefore, the heavy muscimol binding in the dorsal thalamus probably is not the secondary result of differences in cell or neuropil density nor in total available membrane.

Taxonomic Differences in Muscimol Binding

Returning to the muscimol binding results themselves, Figure 2 allows comparison of the relative amount of bound muscimol in the dorsal thalamus and in the entire diencephalon, for non-mammalian vs. mammalian species and for marsupial vs. placental mammals. In

the top graphs it can be seen that a greater density of muscimol binding was found in the mammals than in the non-mammals in dorsal thalamus ($F_{61}, p < .04$).

In the bottom graphs in Figure 2, it can be seen that the marsupials (Monodelphis and Didelphis opossum) had relatively more muscimol binding than the placental mammals and this statistically reliable difference appeared both in the dorsal thalamus alone ($F_{61}, p < .04$) and in the entire diencephalon ($F_{61}, p < .04$).

Possible Phylogenetic Trends in Muscimol Binding

Because reliable mammal/non-mammal differences and reliable marsupial/placental differences were found in the relative density of muscimol binding in dorsal thalamus, we were encouraged to analyze the possibility of a phylogenetic trend along the Anthropoid ancestral lineage. Figure 4 shows the amount of muscimol binding among the species when they are arranged on the basis of their nearness of kinship, or recency of last common ancestor, with Anthropoids and thus with humans (i.e., see Fig. 1).

It can be seen that for the entire group of species, no reliable trend appears (see dotted line in Fig. 4, left). Nor does a trend appear when the two non-mammals are omitted and only the seven mammals included (see dashed line in Fig. 4, left). It is only when the two marsupials as

well as the two non-mammals are omitted (leaving the 5 placental mammals alone) that a statistically reliable trend in muscimol binding appears in dorsal thalamus (see solid line in Fig. 4, left). Therefore, despite the small sample size of placental species ($n = 5$) and with only 3 deducible grades (grades `2', `3', and `4'), an increase in muscimol binding along the placental segment of the Anthropoid ancestral lineage is probably present. There is no reason to think that this would not continue into the human lineage.

Discussion

The primary results show that profiles of the relative density of muscimol binding across the four major subdivisions of the thalamus are similar among amniotic vertebrates regardless of their class, order or family. In contrast, the results suggest that there are statistically reliable differences in muscimol binding between mammals and non-mammals, between marsupial and placental mammals, and depending on their degree of kinship with Anthropoids, among the placental mammals in the sample.

The Neurochemical Plan of Amniote and Mammalian Thalamus

The constancy of the relatively dense muscimol binding in the dorsal thalamus across the nine diverse species of amniotes suggests that the presence of high affinity GABA-A receptors in the dorsal thalamus may be a fundamental principal of neural organization at least among later vertebrates. As noted above, similarity of particular receptor types across a variety of species, orders, classes, and even phyla has been noted by others and has obvious implications regarding neurochemical `conservation' over long periods of brain evolution (eg., Cole et al., 1984, Mann and Enna 1980, Nielsen et al., 1978). One is inclined to think of directional selection tending to alter a species, rather than to keep it constant. In point of fact, stabilizing selection is probably usually maintaining the constancy of a character rather than altering it (i.e. see Sheppard, 1960). This seems to be true even at the level of the biochemistry of the synapses. Second, the increase of muscimol binding in mammals compared to non-mammals suggests an increase in high-affinity GABA-A receptors in mammals and therefore, a greater role of inhibitory processing in the mammalian variety of dorsal thalamus. Because there are close parallels in the evolutionary development of dorsal thalamus and cerebral neocortex, a difference in the thalamus in mammals (see hypothetical ancestor `1' in Fig. 1) and their premammalian ancestors (`0' in Fig. 1) might well be a concomitant of the enhanced cortical development of the cerebrum seen in the mammals over the same period of geological time -- perhaps a demand placed on the dorsal thalamus by the emergence of mammalian cortex itself.(e.g., Nauta and Karten 1970, Northcutt 1984, Pritz and Stritzel 1994, Rose and Woolsey 1949, Veenman et al., 1994, Butler, 1994). That may mean for human evolution there has been a progressive increase not only in cortex but also in the thalamus supporting the cortical development. Further, along with selective pressure for an increase in cortical size has come an increase in the inhibitory receptors and therefore the ability to inhibit ongoing activity.

Finally, the notion that the GABAergic gating in the thalamus might have been altered during the further evolution of the Primate (and therefore human) brain is generally supported by the results of the present study (cf, Cole et al., 1984, Mann and Enna 1980, Nielsen et al., 1978, Penny et al., 1984).

Since the dorsal thalamus eventually achieved a high density both of GABA-A receptors and GABA-ergic neurons in Primates (including humans), the dorsal thalamus seems to have had a unique and persistent status in its potential for inhibitory and probably disinhibitory gating of information directed toward the cerebral cortex. Perhaps this is the basis for the saying that the mark of intelligence lies as much in what one does not say or do as it does in one's words or actions!

Acknowledgements

I dedicate this manuscript to the late R. Bruce Masterton because it was in his continued search for links with our common ancestry that the seeds of this research were born. I also thank Bobbi Baker for her knowledge and skill with receptor binding techniques. This work was supported in part by NIH grant NS07726.

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Table Caption

TABLE I. Specific muscimol binding (total binding minus nonspecific binding) in the four subdivisions and the total diencephalon for the seven mammals and two non-mammals. In each case the greatest degree of binding was found in the dorsal thalamus.

Figure Legends

Figure 1. Relationship of the nine amniotes in the present sample with five successive hypothetical ancestors in the Anthropoid lineage. Premammalian (0), mammalian (1), placental (2A,2B), archontan (3; Lockett, 1980), and primate (4) ancestral grades are arbitrarily labeled to yield a total of 5 distinguishable grades. Note that if edentates (2A; Armadillos) are accepted as having more remote common ancestry with Anthropoids than rodents (2B; e.g., Novacek 1992) then the 'last common ancestor' scale would expand to a total of 6 separable grades, with 4 grades within placental mammals alone.

Figure 2. Four scatterplots of the distribution of bound muscimol in dorsal thalamus (left) or entire diencephalon (right). Top graphs compare non-mammals and mammals. The difference between non-mammals and mammals is statistically reliable only for dorsal thalamus (see gray

p-value in top left). Bottom graphs compare marsupials and placentals. The difference between marsupials and placentals is statistically reliable both for the dorsal thalamus (bottom, left) and for the entire diencephalon (bottom, right).

Figure 3. Muscimol specific-binding in the subdivisions of the diencephalon for the seven mammals and two non-mammals relative to the binding in dorsal thalamus. Note that the binding in the dorsal thalamus is the most dense in each species while the binding in the hypothalamus is more dense than in either the epithalamus or ventral thalamus.

Figure 4. Specific muscimol binding for the nine animals arranged on the basis of recency of their last common ancestor with mankind. Three lines in each graph show relationships of binding in successively smaller subsets: amniotes (n=9), mammals (n=7), and the placental mammals (n=5). Only the relationship between muscimol binding in the dorsal thalamus among the five placental mammals is statistically reliable (see shaded label in the left graph).

Raymond B. Cattell and the Fourth Inquisition

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Raymond B. Cattell was selected to receive the Gold Medal Award for Life Achievement from the American Psychological Foundation. The award ceremony was canceled at the last minute when threats were made to disrupt the Chicago convention of the APA amid charges that Cattell's work was racist. It took only two political activists to derail the APF. This event is analyzed as an instance of Inquisitional attack on rational thought and inquiry, in the context of modern liberalism with radical egalitarianism.

The events of August 1997 will assure that the already eminent scientist Raymond B. Cattell will be remembered in history as elevated to the pantheon occupied by such as Roger Bacon, William of Occam, and Galileo Galilei. The infamous events of August and the players will be summarized below, but first a context needs to be established in order to make any sense of the scurrilous attack and the craven response of the American Psychological Association (APA).

Approaches to Knowledge

The Harvard biologist, historian and philosopher of science Ernst Mayr (1982) has suggested that as human populations evolve from savagery to civilization their approach to knowledge takes one or another of two paths.

One approach leads to modern science, the other to authoritative dogma. The direction toward science, traceable back to the philosophies of ancient Greece, is unique to Western civilization. The much more common direction toward authoritative dogmas is illustrated by the revealed religions that sprang from the Middle East.

The direction toward science traces to the first recorded Western philosopher, Thales of Miletus (c.636-c.546 BC). Thales maintained that to gain knowledge and understanding one should start with naturalistic observation, that is, descriptions of events as they exist in the real world. We should then seek natural explanations for natural phenomena. Gods, supernatural beings, and forces or events that were outside the system should not be invoked as explanations for events within the system. A third major position was that it is acceptable, even encouraged, to question existing explanations, to use criticism in order to improve knowledge and theories. These three principles that trace to the beginnings of recorded Western thought capture the essence of modern science; naturalistic observation, natural explanation, and criticism as a beneficial tool to advancing knowledge.

Alas, from Thales' time through today his approach has, on a worldwide basis, been a minority position under constant attack. The road to dogma starts with assertions of knowledge based in authority. Often from a great man or leader come statements, frequently but not always based in revelation. The religious and political aspects of dogmatic systems often become commingled. The revelations leading to dogmas often claim supernatural inspiration, but this is not necessarily the case. Christian theology, Marxian sociology, and Freudian psychoanalytic theory equally well illustrate dogmatic belief systems. The systems with their statements to account for reality become codified into a set of rigid beliefs. Not only is criticism and questioning not encouraged, it is condemned. The less than complete supporter, the doubter, is shunned, outcast, outlawed, a heretic, criminal and evil sinner. Followers will believe on the basis of acceptance of authority ("on faith") and will not deviate from the established dogmas that tend to become ever more rigid. Encounters with the partially understood real world, in all its foibles, always lead to discrepancy between dogma and natural observation of real phenomena.

It is considered necessary to preserve the authoritarian dogma and the power of the authorities in the face of conflicting truths. The Path of Righteousness knows what is good for man and society. Dissenters, free thinkers, or those with new knowledge are viewed as a threat to all that is Good. Sanctions, laws, censorship, need to be imposed and enforced. This is the realm of Inquisitions. In the history of Western civilization there have been four main identifiable inquisitions. It is the fourth that we suffer today.

Inquisitions

First Inquisition. The first major inquisition was established in 1233 AD to suppress heresy. The groundwork leading up to the need for this inquisition extends back to the origins of the Christian religion in the west. The few centuries around the time of the fall of the Roman Empire were turbulent. The Roman Emperor Constantine I had his famous vision (312 AD) which led to his establishment of Christianity as the official religion of the Empire. Shortly thereafter the Empire fell; various invading Germanic tribes repeatedly sacked Rome. In the turmoil many of the writings of the ancients, Greek and Roman, were temporarily "lost" to Western civilization. Aristotle, Galen, Thales, were reintroduced only centuries later.

St. Augustine (354 - 430 AD) early systematized Christian doctrine in his monumental *On the Trinity*. He argued against paganism in *The City of God*, and provided what has been called a "classic of Christian mysticism" in his autobiographical *Confessions*. Augustine came to be recognized as the father of theology and over the centuries of the dark ages his approach became official dogma.

The essence of Augustinian dogma is that truth must be accepted on faith. And truth resides in the revealed word of God as represented in the Bible and interpreted by the leaders of the Church. With the "rediscovery" of the learned writings of the Ancients, often acquired from Islam and translated from Arabic back into Latin, problems arose. Here was knowledge, and

approaches to knowledge such as Aristotelian deductive logic, not envisioned in the existing dogma. The age of the scholastics was upon the world as scholars tried to incorporate the new knowledge.

Robert Grosseteste (1175 - 1253), Franciscan and first chancellor of Oxford University, studied Aristotle and attempted to integrate the Greek knowledge with Christian dogma. He suggested that there were actually two routes to knowledge, observation with deductive reasoning was one route, while authority (revelation from the written word as interpreted by dogma) was another. In the direction of science, Grosseteste formulated his famous Principle of Falsification: when faced with an apparent conflict between observation and dogma, go with the observation. Experience can falsify the pronouncements of authority.

This won't do at all, hence the Papal Inquisition of 1233. Times were dicey for the scholastics. William of Occam (c.1285 - 1349) escaped capture when he fled. In the same year (1264) was published Roger Bacon's *De Computo Naturali* and Thomas Aquinas' *Summa Contra Gentiles*. For his troubles Bacon (c. 1214 - 1294) was imprisoned - 15 years - for heresy. Among the charged crimes was "suggesting novelties". Although it was touch-and-go for Aquinas (1225 - 1274), he was eventually sainted and his solutions (*Summa Theologica*) became the new dogma. As had Grosseteste, Aquinas tried to integrate Greek natural philosophy, essentially Aristotle, with Christian dogma. In God's perfect wisdom these two approaches to knowledge will always ultimately agree. However, in our fallibility there will on occasion appear to be a conflict between rational observation (science) and the revealed word (religion). When in doubt, go with revelation. The subsequent hardening of the new theology into dogma set the stage for the third inquisition.

Second Inquisition. The second of the major inquisitions was established in 1478 as the Spanish Inquisition. This one was primarily the result of conflicts between competing segments of society. The Spanish monarchy established the inquisition to enforce laws of conversion and to catch false converts. Over the preceding centuries members of the Jewish community had steadily amassed increasing proportions of wealth and power. They, along with Muslims, had been forced to either convert or leave the country. When it was suspected that many of the conversos were secretly retaining their Jewish values and culture, the inquisition was established to root them out. A consideration of this second recognized inquisition would lead too far astray for the present essay. MacDonald (1994) provides an in-depth consideration of the Spanish Inquisition from the point of view of the social sciences.

Third Inquisition. The third of the main inquisitions was established in 1542 to suppress heresy. As with the first inquisition, a basic problem was that the established authorities would not integrate new knowledge that was discovered after the establishment of their dogmas. Instead the new knowledge was treated as a central threat to all that was good in society. Suppression and censorship was the answer.

The synthesis of Greek wisdom and Christian theology that was rigidified as dogma after the work of St. Thomas Aquinas included the flat earth with man as the center of the universe. Clearly the Copernican heliocentric theory of the solar system could not be tolerated. Although widely discussed, Copernicus' theory was published only in 1543 when the author was on his deathbed, and then presented only as a speculative thought exercise. It was in 1591 that Giordano Bruno (1548 - 1600) was arrested for a variety of thought crimes, including that he believed the Copernican "theory" to be true.

Andrew White (1896/1965) poignantly wrote:

But the new truth could not be concealed; it could neither be laughed down nor frowned down. Many minds had received it, but within the hearing of the papacy only one tongue appears to have dared to utter it clearly. This new warrior was that strange mortal, Giordano Bruno. He was hunted from land to land, until at last he turned on his pursuers with fearful invectives. For this he was entrapped at Venice, imprisoned during six years in the dungeons of the Inquisition at Rome, then burned alive, and his ashes scattered to the winds. Still, the truth lived on.
(p.125)

It has been pointed out that in the latter decades of the 20th century the fourth inquisition no longer burns its victims, although it has arranged the firing of rather many. The story of Galileo Galilei (1564 - 1642) is well known to all. Only a decade after the burning of Bruno, Galileo built a telescope. By 1610 he was proclaiming on the basis of new evidence the truth of the Copernican Theory. In essence, "come look through the telescope and see for yourself the evidence for the theory". Arrested by the Inquisition in 1616, he was released only to be re-arrested in 1633. Held under house arrest, the old man was forced under threat of torture to recant.

For the physical sciences the inquisitional suppression and censorship was coming to an end. Indeed, Isaac Newton (1642 - 1727), born in the year of Galileo's death, lived to be knighted and upon death was buried in Westminster Abbey, two of the highest honors from his Church and Country.

Lagging the physical sciences by a few centuries, the psychological and social sciences are still suffering attempts at suppression and censorship, which characterize the inquisitional approach.

Fourth Inquisition. The fourth inquisition was established in the mid-twentieth century to suppress heresy. As with the first and third inquisitions, a main problem has been that the ideologues did not integrate new knowledge with their already established objectives and dogmas. Instead they viewed new discoveries as a direct threat to all that was good and important in society. As with the earlier inquisitions, the fourth attempts to suppress and censor new knowledge that is perceived to be threatening to old dogmas.

Somewhere between Thomas Jefferson and William Jefferson Clinton an influential segment of the intelligentsia lurched far to the ideological and political left. Thomas Jefferson certainly did not confuse rule of law ("all men are created equal") and hereditary reality. In a letter to John Adams, Jefferson wrote,

I agree with you that there is a natural aristocracy among men. The grounds of this are virtue and talents For experience proves, that the moral and physical qualities of man, whether good or evil, are transmissible in a certain degree from father to son." (Jefferson, 1813).

In the face of what experience proves, and in open antagonism to much of twentieth century science, a powerful strain of modern liberalism worships radical egalitarianism. Modern liberalism is attempting to enforce Lysenkoism throughout Western civilization. The travesty that is Lysenkoism ruined the science and economy of the Soviet Union. It is well known as an example of the folly of attempting to repeal truth in the service of ideology (Berg, 1988; Medvedev, 1971; Soyfer, 1994). What is less often acknowledged is that the spirit of Lysenkoism is alive and well in the form of modern liberalism's enforcement of radical egalitarianism.

There and here the guiding theory is identical; it is socialist utopia based on egalitarianism, with what the behavioral scientists call environmental determinism. In 1948 Stalin actually outlawed genetics as being a western bourgeois construction that was incompatible with the truths of Marxist-Leninism. Like outlawing the heliocentric nature of the solar system. Hillary doesn't have quite that political clout, yet.

The theory that Stalin and Hillary share is that all those newborns, wheat plants for Uncle Joe, human babies for Mother Hillary, have identical potentials for growth and development. If some individuals don't do as well as others, it is because of their early experience. This is obviously true - everyone knows that fertilizer is important for wheat plants, and everyone knows that early nutrition and stimulation is important for humans. This is so obviously true that anyone who questions its application to the problems at hand is an idiot, an enemy of the state, and a mean-spirited hate monger. There the eminent scientist who objected, the geneticist Nikolai Vavilov, died of disease and starvation in Gulag. Here eminent scientists that voice objections are subjected to vitriolic ad hominem attacks [And the end of whatever federal research support they may have had].

In addition to individual differences there are those vexatious group differences. There winter wheat and spring wheat did not produce equal crop outcomes. Here it is altogether too obvious that various ethnic/racial groups do not produce equal educational, criminal, or job performance outcomes. Although no one was actually sure of all of the reasons for the differential outcomes, if you did not acquiesce to the environmentalist socialist egalitarian explanation, you were evil,

a maverick beyond the pale, beyond the bounds of acceptable discourse. There a hated Morganist-Mendelist, here a contemptuous racist. (Whitney, 1997).

Exactly where and how modern liberalism escaped the bounds of reality is a topic of widespread discussion. The seeds of radical egalitarianism may be contained in the basics of Christianity, with its teaching that all men are equal in the eyes of God (Bork, 1996; Pearson, 1996). Certainly the nineteenth century New England, largely Unitarian, social reformers were influenced not only by their religion, but also by the contemporaneous revolutionaries in Europe.

A major lurch to the left occurred with the bloody French revolution's slogan of "liberty, equality, fraternity". Then there was the 1847 publication of the Communist Manifesto, followed by the 1848 wave of riots and revolutions throughout Europe. The 1867 first volume of *Das Kapital* was dedicated to Darwin for the notions of evolutionary materialism and progress in the world. However, it is essentially non-biological and like the rest of Marx's writing contains no appreciation of evolutionary biology.

In areas pretending to science, as late as 1934 Franz Boas was maintaining that the basis of all serious study was the work of Theodor Waitz. Waitz's major work of 1858 was the pre-Darwinian *On the Unity of the Human Species and the Natural Condition of Man*. This thread was not originally anti-Darwinian; rather it was a-Darwinian or non-Darwinian, an approach to the study of man rooted in biblical creationism with a monogenesist emphasis (Mayr, 1982; Degler, 1991).

Many writers agree that a major wrenching leftward happened with the protest decade of the 1960s. In his autobiographical *Radical Son*, David Horowitz (1997) describes how a group of ideologically committed red-diaper babies, with support and encouragement of the underground Communist Party, engineered much of the radicalism of the 1960s. In *Destructive Generation* Collier and Horowitz (1995) explain that "the utopianism of the Left is a secular religion. However sordid Leftist practice may be, defending Leftist ideals is, for the true believer, tantamount to defending the ideals of humanity itself. To protect the faith is the highest calling of the radical creed. The more the evidence weighs against the belief, the more noble the act of believing becomes" (p. 246).

There is a "readiness to reshape reality to make the world correspond to an idea" (p. 37). There is a "willingness to tinker with the facts to serve a greater truth" (p.37). And so it has obviously been since the 1960s. Over recent decades, as the scientific data accumulate the stridency of the Left intensifies. Driven by ideology and not constrained by the truth, as all else fails they engage in misrepresentation and character assassination.

Raymond B. Cattell described some aspects of the workings of this inquisition which has been snarling at his heels for many decades. In *A New Morality from Science: Beyondism*, Cattell

(1972) wrote:

The danger is not only that politicians and private institutions with axes to grind will find tame or corruptible social scientists to support their positions. The greater danger which recent experiences both here and abroad, e.g., Lysenkoism in Russia, have revealed is that partisans primarily political in interest and intention either accidentally or deliberately infiltrate the ranks of science. In the case of the Lysenko episode, and comparable events in Nazi Germany, the disturbing realization to scientists was that the exile or death of those ejected from their academic positions followed what seemed initially to be severe technical criticism by fellow scientists, but was actually politically staged." (p. 38).

Robert Bork has commented on a recent high-profile example of "what seemed initially to be severe technical criticism by fellow scientists" (Cattell, 1972, p.38). Bork (1996) pointed out that:

For egalitarians there is always lurking the nightmare that there may be genetic differences between ethnic groups that result in different average levels of performance in different activities. Only that fear can explain the explosive rage with which some commentators received *The Bell Curve* by the late Richard Herrnstein and Charles Murray, which, as a small part of a much larger thesis concluded that there are heritable differences in cognitive ability among the races. Some comments expressed respectful and thoughtful disagreement, some asked for careful reexamination of the data and arguments, but some did little more than shout "Nazi". Herrnstein and Murray are not racists but serious scholars. They may be right or they may not, but the episode indicates the degree to which the ideology of egalitarianism censors expression and thought in sensitive areas. (pp. 267-268).

Many contemporary events amply illustrate the truly inquisitional nature of modern liberalism in the defense of radical egalitarianism. The titles of some papers written by targets of the inquisition are informative, such as "Egalitarian fiction and collective fraud" (Gottfredson, 1994) and "Ideology and censorship in behavior genetics" (Whitney, 1995). While under criminal investigation instigated because of his research, Rushton (1994) wrote "The equalitarian dogma revisited".

It is Christopher Brand, lately of Edinburgh University, UK, who in 1997 suffered the high penalty of being fired for challenging the egalitarian fiction. Having been on the psychology department faculty for over twenty years, in 1996 Brand authored a book entitled *The g Factor*. Published in the UK by John Wiley & Sons, one of the largest of the international scholarly houses, the company's promotional literature contained the statement:

The nature and measurement of intelligence is a political hot potato. But Brand in this extremely readable, wide-ranging and up-to-date book is not afraid to slaughter the shibboleths of modern 'educationalists'. This short book provides a great deal for thought and debate.

Brand's book enjoyed brisk sales in the UK for about 6 weeks, and was scheduled for release in the US, when it was suddenly "depublished", actually withdrawn from circulation, seemingly at the command of Wiley's New York executive headquarters. Wiley told the media that the book "makes assertions that we find repellent". Branded a "racist", Christopher Brand was in due course suspended from teaching and administrative duties at Edinburgh University. A "Special Tribunal" was convened, following which Mr. Brand was sacked. At the time of this writing, and in accord with the procedures of classical Lysenkoism, the proceedings of the Special Tribunal remain secret.

The present fourth inquisition is directly analogous with the preceding first and third inquisitions. The agenda and objectives of liberalism were established first before, and then with complete disregard for, Darwin's (1859) *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. The dogmatic position of modern liberalism with radical egalitarianism was established in a philosophical and political context. The positions were hardened into dogma with no regard for the discoveries of the explorations of the 19th century. Additionally, the genetics and behavior genetics that routinely attacked with religious fervor by the radical egalitarians twentieth century science, not nineteenth century political theology. Marx was writing in the 1840s and 1860s, while Mendel's epoch-setting experiments and theory were not widely appreciated until after 1900.

Unfortunately the radical egalitarianism characteristic of modern liberalism became formalized as a quasi-theological dogma just before the discovery of much new knowledge. Just as the first inquisition arose because the existing dogma did not encompass knowledge of Aristotle, and the third inquisition functioned because the dogma was inconsistent with the discoveries of Copernicus and Galileo, so the current fourth inquisition exists in large part because its dogma is inconsistent with the discoveries of Darwin, Galton, and Mendel.

One must never underestimate what Richard John Neuhaus called "the profound bigotry and anti-intellectualism and intolerance and illiberality of liberalism." (Bork, 1996, p. 336).

The Events of August 1997

The highest honor bestowed by the American Psychological Association (APA) is the Gold Medal Award for Life Achievement in Psychological Science. As the APA prepared for its 105th annual convention to be held in August, the house organ *American Psychologist* (1997) for August announced the winner of the Gold Medal.

The American Psychological Foundation (APF) Gold Medal Awards recognize distinguished and enduring records of accomplishment in 4 areas of psychology. The 1997 recipient of the Gold Medal Award for Life Achievement in Psychological Science is Raymond B. Cattell.

Joseph D. Matarazzo, President of the APF, will present the Gold Medal Award for Life Achievement in Psychological Science at the 105th Annual Convention of the American Psychological Association on August 16, 1997, at 5:00 p.m. in Ballroom III of the Sheraton Chicago Hotel and Towers in Chicago. (p. 797).

The 92-year-old Cattell, with a traveling companion to assist him, traveled from his retirement home in Hawaii to be at the meeting in Chicago to receive this special honor, a gold medal award for a lifetime of work. But Joseph D. Matarazzo did not present the Gold Medal on August 16. Instead:

On Aug. 13, the foundation decided to postpone the presentation of the award to Raymond B. Cattell, in the week preceding the opening of the APA's 1997 Annual Convention, concerns that Cattell's writings were racist and advocated the separation of the races were voiced to the association. (<http://www.apa.org/monitor/sep97/award.html>).

Since its founding in 1892, the American Psychological Association (APA) has only once changed the statement of objectives contained in its bylaws. In 1892 the one objective was "to advance psychology as a science." From 1945 there have been three: "The object of the APA shall be to advance psychology as a science, as a profession, and as a means of promoting human welfare". From 1945, political concerns, left wing, became a more prominent, and contentious, part of the APA. In the files of the historian of the Psychonomic Society are letters from prominent psychologists of the time: "All manner of interests, mostly non-scientific, sprang up"; the APA proliferated into a "chaotic monster" that "fails to discriminate between science and charlatanry". It engaged in much political lobbying for mostly liberal causes. In protest, breakaway scientists formed the Psychonomic Society in 1959. Many members of the APA drifted away over the years, often in protest of the politicization of the Association. Finally a major schism occurred. In 1987/88 psychologists who wished to separate from the increasingly professional and political APA formed the American Psychological Society. Perhaps it should not be a surprise that the remnant APA was such an easy mark for the Inquisition in 1997.

The New York Times for August 15 reported an interview with Rhea Farberman, director of communications for the association:

Ms. Farberman said a committee had voted to give Cattell the award "before it knew of the information that has since come to light," adding "This new

information has raised a lot of concerns, and we want to be thorough in making a judgment." (Hilts, 1997).

This excuse of new information "coming to light" is preposterous. Cattell has never been retiring about his interpretations of data and theory. Frankly outspoken throughout his long career, his views have been widely known for decades among the scientific community. Ms. Farberman appears to be impugning the competence of the leading psychologists that had in full knowledge chosen Cattell for their most prestigious award. It was not even for "new information" that Cattell is on the hit list of the Inquisition; that information has been public knowledge for years.

Poor Ms. Farberman, and the APF, should have realized that with the (as yet) uncensored Internet it is becoming almost impossible to hide the most embarrassing details of organizational snafus. From winnowing great masses of Internet traffic (and admittedly some of it second-hand or further removed, and impossible to cite confidential sources) it seems that it was not new information but failure of courage that tripped up the APF. Apparently the original and lengthy letter of nomination spelled out both Cattell's scientific strengths and specifically flagged those of his views that are deemed controversial. A committee of some six well-informed past-presidents chose Cattell as deserving the Gold Medal with full knowledge of his works. Then after the award was publicly announced, a well-experienced Inquisitor, Barry Mehler (not himself a psychologist), is reputed to have threatened to disrupt the convention if the award were given to Cattell. Shades of a '60s convention in Chicago! Against much advice, and with at least one eminent psychologist threatening to resign if he did so, Matarazzo decided to cancel the ceremony and further investigate the award.

The official citation that accompanied the Gold Medal Award is as follows:

In a remarkable 70-year career, Raymond B. Cattell has made prodigious, landmark contributions to psychology, including factor analytic mapping of the domains of personality, motivation, and abilities; exploration of three different medias of assessment; separation of fluid and crystallized intelligence; and numerous methodological innovations. Thus, Cattell became recognized in numerous substantive areas, providing a model of the complete psychologist in an age of specialization. It may be said that Cattell stands without peer in his creation of a unified theory of individual differences integrating intellectual, temperamental, and dynamic domains of personality in the context of environmental and hereditary influences. (Amer. Psychol, 1997, 797).

The fact is that it was Cattell's massive contribution to science that led to the APF decision to select him for this prestigious award, but the decision to withhold it was made on purely political grounds, i.e. that he "advocated the separation of the races." It is that substantive and theoretical domain specified in the last two words of his citation, "hereditary influences", that

long ago flagged Cattell as a target of the Inquisition. In craven response to the attack on Cattell, the APA announced that the American Psychological Foundation would now appoint a special Blue Ribbon Panel, to consist of both psychologists and non-psychologists, to review the award.

The Accusers

Only two accusers have been publicly mentioned as attacking the award of the Gold Medal to Cattell. Apparently it doesn't take much to derail an organization as sensitive to the Inquisitional furies as is the APA. Neither were psychologists. The heavyweight was Abraham Foxman, identified in the New York Times as "the national director of the Anti-Defamation League of B'nai B'rith," who has "written to the association protesting the award, saying it would give the group's `seal of approval to a man who has, whatever his other achievements, exhibited a lifelong commitment to racial supremacy theories.'" (Hilts, 1997).

Although it was probably the criticism of the influential ADL organization that caused the APA to hold up the award at the last moment, the initiative would seem to have come from the lesser accuser, one Barry Mehler, an associate professor of humanities at Ferris State University in Big Rapids, Michigan. Mehler has incorporated something that he calls "The Institute for the Study of Academic Racism (ISAR)".

On the Internet Mehler has provided quotes of himself: "ISAR created this story and it's far from over,' Mehler said. `It is gratifying to see my Institute attain this level of credibility in so short a time. I will be monitoring the investigation of the blue-ribbon committee.' ... Mehler ... has made national headlines with his recent criticism of the American Psychological Foundation's (APF) choice of psychologist Raymond B. Cattell for a lifetime achievement award Mehler's protest has stirred up national publicity in the New York Times, The Chronicle of Higher Education, Reuters, and the Associated Press. Mehler has been interviewed by radio giant WBAI in New York and has received numerous inquiries into the Cattell issue". Mehler has also posted a sample of his writing, a paper entitled "In Genes We Trust: When Science Bows to Racism". Mehler reports that the paper was a cover feature in the magazine Reform Judaism for Winter 1994, and was revised and republished in four further outlets, 1, The Public Eye, 2, RaceFile, 3, Networking: A Publication of the Fight the Right Network, and 4, B'nai B'rith Messenger.

The paper is replete with passages such as: "With its legacy of Dr. Josef Mengele's twin experiments at Auschwitz and Dr. Burt's bogus science, twin studies fell into disfavor". Adjectives scattered throughout include "racist", "Hitler's race ideology", "Nazi produced", "Fascist ideologist", "notoriously anti-Semitic", "fraudulent", and it concludes, "we must beware of scientists who wish to play God".

Such loose use of similies is reprehensible. Mehler is seemingly confusing anti-liberalism with anti-Semitism. Anti-liberalism apparently is often confused with anti-Semitism. To illustrate, in the newsletter Details for July 1997, published by The Jewish Policy Center, Rabbi Daniel Lapin wrote:

I would like to argue that the root cause of both anti-Semitism and intermarriage in America today is the same, namely, the Jewish community's disproportionate liberalism The vast majority of Americans care deeply about the value of family and religion. They recognize that these institutions have been the pillars of moral society for millennia. They realize that liberalism, which devalues these institutions, is largely responsible for the fact that life in America has become more squalid, more expensive, and more dangerous over the past 30 years Though virtually all Americans are too decent to let this blossom into full-fledged anti-Semitism, there is always that threat." (pp. 1-2).

Mehler has been guilty of this confusion for a long time. In the book *Race, Intelligence and Bias in Academe* (Pearson, 1997), author Roger Pearson provides a chapter entitled "Activist Lysenkoism: The Case of Barry Mehler". In this he points out that decades ago Mehler was a student in a "Program for Training in Research on Institutional Racism" that was headed by Jerry Hirsch, and that Hirsch had long ago attacked Cattell. For example, he quotes Hirsch as saying "my University of Illinois squandered a career-long research professorship on [Cattell]." Likening Cattell to the "disgraced Vice President Spiro Agnew," Hirsch railed against Cattell's "Hitler-like recommendations on the need for eugenic foresight" (p. 259).

Pearson continues:

Today Hirsch is retired, and we hear less from him. But his torch is being carried by someone who appears to be even more of a zealot. That someone is his erstwhile student, Barry Mehler. Let us look at this disciple of Jerry Hirsch, an excellent example of a political activist operating from the security of the academic world. Mehler has published little or no non-political material: he appears to specialize in politicized diatribes, filled with inaccuracies, for fringe publications on the Far Left, and glories in participating in non-academic TV shows such as *Geraldo*. His published works have targeted respected scholars with impressive research credentials who reject the aberrant theory that all individuals and peoples are equal (i.e., identical) in their inherited potential abilities. Moreover, copies of these error-filled and scandalous attacks on such scholars have often been mailed to journalists in anonymous envelopes. Recipients have ranged from well-known figures such as Jack Anderson, the syndicated columnist, to editors of student journals and to journalists working for local newspapers in towns where the scholars Mehler lambasts work and reside. (pp. 259-260).

Several qualities consistently characterize Mehler's attacks on the scholars he selects for 'exposure.' He seldom attempts to present scientific evidence to contradict the findings of their research. Clearly, since they are writing within the limits of their own or related disciplines, and he has no demonstrated or academically recognized competence in these areas, he cannot do this. Instead he falls back on ad hominem attacks, labeling some of America's and Britain's finest scientists 'racists,' 'nazis' and 'fascists.' Those whom he has attacked include a long list of distinguished scholars, such as: John Baker (Oxford), Thomas Bouchard (Minnesota), Sir Cyril Burt (London), Raymond Cattell (Illinois and Hawaii), C. D. Darlington (Oxford), Hans Eysenck (London), Linda Gottfredson (Delaware), James Gregor (UC Berkeley), Richard Herrnstein (Harvard), Arthur Jensen (UC Berkeley), Travis Osborne (Georgia), J. Philippe Rushton (Western Ontario), Nancy Segal (Minnesota), William Shockley (Stanford), Audrey Shuey (Randolph Macon Woman's College), Ernest Van den Haag (CUNY), and Daniel Vining (Pennsylvania). (p. 262).

The Charges

The charges lodged against Cattell have been described at some length. There is absolutely no need here to go into any detail with regard to any of Cattell's many technical scientific achievements. This is because, true to the form described above by Pearson, the scientific accomplishments of the great man do not figure in the charges leveled against him. The charges fall into three categories: [A] heresy; [B] blasphemy; and [C] cavorting with devils. In taking the charges up one-at-a-time, I hope to show that after cutting through the invective, and discarding the gratuitous ad hominems, there are indeed large kernels of truth embedded in each of them. As with most victims of Inquisitions, the target is largely guilty as charged.

[A] Heresy. The charge is made that Cattell has been, since the 1930s, an advocate of eugenics. Indeed beyond that, Cattell followed Galton's lead in suggesting that the science of eugenics could form the basis for a new approach to religion. Cattell proposed an ethical system founded in science, to be called "Beyondism". Mehler tells us:

Cattell first outlined his 'evolutionary ethic' based on natural selection in *Psychology and Social Progress* (1933), and that "Cattell's first monograph on the topic was, *A New Morality from Science: Beyondism* (Cattell, 1972), followed by *Beyondism: Religion from Science*" (Cattell, 1987).

The invective is contemptible. Mehler tells us that "'Beyondism' is a neo-fascist contrivance. Cattell promulgates ideas that he formulated within a demimonde of radical eugenicists and neo-fascists ... it is striking for its extremism, racism, and virulent bias". Of course the underlying heresy here, a belief in the well-established truth of genetic influence on individual differences,

is totally at odds with the radical egalitarianism that is the Inquisition's most sacred dogma. Only with genetic causes would most of the practices advocated as eugenics be effective. People who have studied the life and works of Sir Francis Galton know that his original "eugenics" has since divided into two parts. One part, the basic science, has developed into what is today known as genetics and human genetics. The second part, the application of hereditary knowledge for the good of man and society, has developed into the largely voluntary genetic counseling of today (Whitney, 1990). Even Cattell is quoted as saying that his ideas have evolved and he is today an advocate of voluntary eugenics.

Contrary to Mehler's attempts to invoke wrath at the alleged anti-Semitism inherent in research into heredity, he should recognise, as so many Jewish scientists do, that the Jewish community has benefited from hereditarian research and eugenical practices at least as much as any other population. The case of population screening for carriers of Tay Sachs disease, followed by amniocentesis for heterozygous couples and voluntary abortion of affected fetuses, has been hailed as a great "life-giving". Parents can now choose to have a healthy baby instead of suffering through the agonizing death of a Tay Sachs affected child. For many years screening for Tay Sachs was limited to members of the Ashkenazim because they are the only population group with a relatively high frequency of the gene for Tay Sachs disease (Kaback, 1977). This is applied genetics eugenics in action. So too is the recently announced screening for the first identified gene that is causally linked to colorectal cancer. The screening is to be limited to Ashkenazim, the only group yet found to harbor the gene (Hopkins, 1997a, 1997b; Laken, et. al., 1997). Again, eugenics in action. It is hard to understand how such hereditarian research and application eugenics is in any way "anti-Semitic", as Mehler has claimed.

Other sources list many advocates in making the point that back into the 1930s and before, many social progressives of both the right and the left were enthusiastic eugenicists (Pearson, 1996). One only has to think of H. G. Wells, J. B. S. Haldane, Sidney and Beatrice Webb, and Herman J. Muller. It has also been emphasized elsewhere that the painting of eugenics with the tar brush of a slippery slope to Nazism is post-war propaganda that is largely devoid of substance (Whitney, 1996). The very recent "exposés" in the newspapers of governmental sponsored eugenic programs in various social democratic countries even into the 1970s (e.g. Canada, Sweden, Finland, Denmark, Switzerland) serves to underscore the lack of relationship.

The charge published in The New York Times that Cattell is "a man who has, whatever his other achievements, exhibited a lifelong commitment to racial supremacy theories" (Hilts, 1997) needs translation out of political invective. Yes, it is true that as an outstanding scientist with many other achievements, Cattell has exhibited a lifelong commitment to attempting to understand the causes of both individual and group differences. Cattell is guilty of being a scientist with an interest in the causes of individual differences. As such he has followed the empirical data wherever it may have lead. As just one example of suspected environmental effects, cognitive scientists have in recent decades been very interested in the so-called Flynn effect. The finding that in industrialized societies there seems to be taking place a substantial

and prolonged increase in the level of intellectual functioning (Flynn, 1987). This is a phenomenon that Cattell empirically found and reported decades ago (Cattell, 1951).

Cattell is only guilty of advocating a version of secular humanism incorporating aspects of morality and ethics that would be informed by knowledge from modern science. He named it "Beyondism".

[B] Blasphemy. Mehler plays the Hitler card in order to underscore Cattell's reprehensibility:

Hitler actually shared many values of the average American. He aimed at full employment, family values, and raising the standard of living, and countless other things, including the Volkswagen, which he designed himself for the average family. (The Beyondist, 1994, p. 2).

This is simply an attempt to smear Cattell by making him out to be a fan. Mehler is essentially quoting out of context. He omits the next and concluding sentence of Cattell's passage, which was:

The man turned out evil in his militarism and his treatment of the Jews and dissident Catholics, but that does not justify, to a rational person, calling all his attitudes mistaken.

If we were to respond flippantly to Mehler's nonsense, we could point out that according to customer information at the Volkswagen Company (phone 1-800-822-8987), through March of 1996, 21,276,932 persons have voted with their purchase in agreement with Cattell that in the Volkswagen Hitler did a good thing. But on a much more serious note, here it is only Mehler that is guilty of blasphemy. Mehler in effect trivializes the Holocaust by his loose and inappropriate invocation of Hitler.

[C] Cavorting with Devils. Mehler freely engages in guilt-by- association. Quite a few, mostly obscure or effectively marginalized, persons are named.

Wilmot Robertson seems to be the worst of the lot. Mehler says "To my knowledge, Cattell is the only major academic willing to be forthright about his association with Robertson." We are informed that Wilmot Robertson has written a few books, including one entitled The Dispossessed Majority, and that he publishes a "neo-fascist magazine" that is targeted toward an educated audience that is named Instauration. But that may be as it may be. Cattell is certainly not responsible for anything Robertson may write or publish. Neither is any interest he may or may not have in reading Robertson's publications a justifiable reason for denying him a well-earned award for his contributions to science. The recent behavior of the APA seems to indicate that science is still subject to politics under the current rule of the Fourth Inquisition.

Mehler even attacks Cattell's association with The Mankind Quarterly, protesting that: "Cattell has published numerous times in Pearson's Mankind Quarterly and Pearson has published a number of Cattell's monographs." Cattell has served on the editorial board of The Mankind Quarterly for many years. Although that journal does not always bend to comply with the dogma of modern politicized liberalism, there is nothing even remotely anti-Semitic about its contents. Mehler may understandably resent Pearson's exposé of his own writings (see Pearson, 1991). but Cattell's willingness to lend his name to the advisory board of The Mankind Quarterly in no way impugns Cattell's own status as a scholar, reflecting only to the credit of The Mankind Quarterly.

Another View

An eminent student of the human condition, the recently deceased Hans J. Eysenck, once addressed the very issues that now face the Blue Ribbon Panel convened by the APF to look into Cattell's Gold Medal:

This, then, is the "trahison des clerics" of which I make complaint: that both students and their elders and betters have begun to play a child's game of goodies and baddies, in which a man's work is judged, not in terms of its scientific content, or on any rational, empirical basis, but in terms of whether it agrees with the critic's preconceptions. And my suggestion for the future is that which Sir Francis Bacon gave centuries ago in *The Advancement of Learning*:

"To have the true testimonies of learning to be better heard, without the interruption of tacit objection, I think good to deliver it from the discredits and disgraces it hath received, all from ignorance; but ignorance severally disguised; appearing sometimes in the zeal and jealousy of devines; sometimes in the severity and arrogance of politiques; and sometimes in the errors and imperfections of learned men themselves ..."

However that may be, there are of course difficult ethical and moral problems and dilemmas involved in the discussion, and the exhortations of militant Leftists should not preclude serious discussion of these problems. Note first of all a 'Resolution in Scientific Freedom,' signed by 50 eminent scientists, among them: Francis H.C. Crick, Nobel Prize-winner, Cambridge University; Jacques Monod, Nobel Prize-winner, College de France; Arthur R. Jensen, University of California; Richard Herrnstein, Harvard University; C.D. Darlington, Oxford University; and John C. Kendrew, Nobel Prize-winner, Cambridge University. The Resolution reads as follows:

The history of civilization shows many periods when scientific research or teaching was censured, punished, or suppressed for non-scientific reasons, usually for seeming to contradict some religious or political belief. Well-known scientist

victims include: Galileo in orthodox Italy; Darwin, in Victorian England; Einstein, in Hitler's Germany; and Mendelian biologists, in Stalin's Russia.

Today, a similar suppression, censure, punishment, and defamation are being applied against scientists who emphasize the role of heredity in human behavior. Published positions are often misquoted and misrepresented; emotional appeals replace scientific reasoning; arguments are directed against the man rather than against the evidence (e.g. a scientist is called 'fascist', and his arguments are ignored).

A large number of attacks come from non-scientists, or even anti-scientists, among the political militants on campus. Other attackers include academics committed to environmentalism in their explanation of almost all human differences. And a large number of scientists, who have studied the evidence and are persuaded of the great role played by heredity in human behavior, are silent, neither expressing their beliefs clearly in public, nor rallying strongly to the defence of their more outspoken colleagues.

The results are seen in the present academy; it is virtually heresy to express a hereditarian view, or to recommend further study of the biological bases of behavior. A kind of orthodox environmentalism dominates the liberal academy, and strongly inhibits teachers, researchers, and scholars from turning to biological explanations or efforts. Now, therefore, we the undersigned scientists from a variety of fields, declare the following beliefs and principles:

- (1) We have investigated much evidence concerning the possible role of inheritance in human abilities and behaviors, and "we believe such hereditary influences" are very strong.
- (2) We wish strongly to encourage research into the biological and hereditary bases of behavior, as a major complement to the environmental efforts at explanation.
- (3) We strongly defend the right, and emphasize the scholarly duty, of the teacher to discuss hereditary influences on behavior, in appropriate settings and with responsible scholarship.
- (4) We deplore the evasion of hereditary reasoning in current textbooks, and the failure to give responsible weight to heredity in disciplines such as sociology, social psychology, social anthropology, educational psychology, psychological measurement, and many others.

(5) We call upon liberal academics - upon faculty senates, upon professional and learned societies, upon the American Association of University Professors, upon the American Civil Liberties Union, upon the University Centres for Rational Alternatives, upon presidents and boards of trustees, upon departments of science, and upon the editors of scholarly journals - to insist upon the openness of social science to the well-grounded claims of the bio-behavioral reasoning, and to protect vigilantly any qualified faculty members who responsibly teach, research, or publish concerning such reasoning.

We so urge because as scientists we believe that human problems may best be remedied by increased human knowledge, and that such increases in knowledge lead much more probably to the enhancement of human happiness, than to the opposite.

I was asked by the British Association for the Advancement of Science to contribute an article on the ethics of science and the duties of scientists, with special reference to these events. What I wrote then I still believe to be right, and consequently the body of the text of my contribution is reprinted here in full. This is what I said:

It used to be taken for granted that it was not only ethically `right' for scientists to make public their discoveries; it was regarded as their `duty' to do so. Secrecy, the withholding of information, and the refusal to communicate knowledge were rightly regarded as cardinal sins against the scientific ethos.

This is true no more. In recent years it has been argued, more and more vociferously, that scientists should have regard for the social consequences of their discoveries, and of their pronouncements; if these consequences are undesirable, the research in the area involved should be terminated, and results already achieved should not be publicized.

The area which has seen most of this kind of argumentation is of course that concerned with the inheritance of intelligence, and with racial differences in ability; many even of those who acknowledge that Jensen's arguments are scientifically correct have argued that he was wrong (and that Herrnstein and I were wrong) in actually publishing the conclusions to which all the experimental work was leading. Stressing the possible hereditary nature of the IQ deficit of American blacks, as compared with American whites, might have serious consequences in jeopardizing the integration between the races so earnestly desired by both sides to the argument; carrying out further research might offend liberal opinion, and lead to further dispute, strife, and even bloodshed.

What good could come of work along these lines, it was frequently argued; the

results would be of purely academic interest as both sides were agreed that there was much overlap in ability between the two races, so that each individual would still have to be judged in terms of his particular pattern of abilities, rather than as a member of a particular race. Better let sleeping dogs lie and studiously turn a blind eye to such facts and theories as might impinge on the general belief in universal egalitarianism, and threaten its very foundations.

"I believe that there are powerful arguments against this modern belief in the opportunistic silencing of inconvenient theories, and the refusal to support research which might unearth equally inconvenient facts, all in the supposed interests of society. The first argument by itself, I would suggest, is quite conclusive; it is based on the impossibility of forecasting the social consequences (or even the scientific consequences) of one's findings and theories. It is impossible to read the history of science without becoming aware of the fact that even the greatest scientists were incapable of looking ahead even a few years and predicting the consequences of their actions." (Eysenck, 1997, pp 45-48).

Guilty as Charged

With regard to Giordano Bruno, "His reward indeed came even for his faulty utterances when, toward the end of the nineteenth century, thoughtful men from all parts of the world united in erecting his statue on the spot where he had been burned by the Roman Inquisition nearly three hundred years before." (White, 1896/1965, p.80).

We can only hope that the Blue Ribbon Panel of the APF can render its verdict with regard to Raymond B. Cattell in a more timely fashion.

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THIS ISSUE OF INTELLIGENCE covers many of the questions with regard to the nature/nurture debate that has been so misreported by the press in the last few years. Ever since *The Bell Curve*, the media has held to the misconception that intelligence, in some unknown way, can be improved significantly if only we improve everyone's environment through better nutrition, various interventions, and educational opportunities. But the research is showing quite a different phenomena, one that is solidly based on recent studies that look at the individual as an emergent, niche-picking organism, not a passive recipient of societies programming. We are finding out that children, while genetically different and unique, will use that uniqueness to become even more unique and differentiated in the social unit that really counts, the family. Competition is between children, not between families as Suloway has so elegantly argued in *Born to Rebel*.

Mainstream Science on Intelligence: An Editorial with 52 Signatories, History, and Bibliography by Linda S. Gottfredson. In the fall of 1994, after the liberal press and various intellectuals had thoroughly trashed the best seller *The Bell Curve*, Gottfredson approached the *Wall Street Journal* with a request for clarification of the issue and instead got permission to give a scientific reply if she could get 10 or 15 cosigners. She only had a few weeks to do it, so she quickly drafted what she felt were 25 statements or conclusions that were known at the time about intelligence and generally accepted as true by other academics. She then had to contact a list of experts. As it turned out, an astounding 52 experts of the 100 who responded (131 were sent invitations to respond) signed the declaration. This was an amazing feat, getting academics to agree on 25 scientific principles! They build their reputations on NOT agreeing with each other. Compare this consensus with the one that followed by the APA in 1995 *Intelligence: Knowns and Unknowns*, and it becomes clear that what was stated in *The Bell Curve*, even though it did not go through academic review as it was aimed at a mass audience, nevertheless was mainstream science as it was known in 1994.

Gottfredson concluded that: "Mainstream Science on Intelligence is a collective statement that was first issued in order to inject some scientific rigor into an increasingly vitriolic and wrongheaded controversy concerning intelligence. That it garnered such immediate support from so many highly regarded scholars testifies to their confidence both that it represents the mainstream and that their joint testimony to that effect was needed in the public realm. No

individual or group has systematically rebutted the statement. Some people might construe the 24-page *Intelligence: Knowns and Unknowns* (Neisser et al., 1996) to be an alternative. However, that report was the result of 6 months' work by an 11-member task force created by the American Psychological Association's Board of Scientific Affairs. (Three of the task force members were also signers of the 'Mainstream' statement.) That report differs in purpose, emphasis, and degree of equivocation, but its conclusions only reinforce the claim that the contents of the 'Mainstream' statement are squarely within the mainstream. It too concludes, for example, that differences in intelligence exist, can be measured fairly, are partly genetic (within races), and influence life outcomes. It is obviously not the case that there is no disagreement about these important issues or that scientific truth is a matter of majority rule. A significant minority of the experts who were contacted disagreed in part or in whole with the statement, and many of the signers would have written the statement somewhat differently. Rather, the lesson here is that what have often been caricatured in the public press as discredited, fringe ideas actually represent the solid scientific center in the serious study of intelligence. As Snyderman and Rothman's (1988) survey of IQ experts and journalists revealed, the media, among others, have been turning the truth on its head." (*Mainstream Science on Intelligence and Intelligence: Knowns and Unknowns* is available from this web site.)

Psychometrics, Intelligence, and Public Perception by John B. Carroll. Carroll takes on six propositions as stated in *The Bell Curve* in hopes of clarifying where they stand (in early 1997) versus what the media had been reporting. He also notes that whatever anyone says, nothing in the social sciences is beyond technical dispute and he endeavors to show to what level of consensus science has progressed on some key issues.

Proposition 1 is, "There is such a thing as a general factor of cognitive ability on which human beings differ." Carroll describes factor-analytic research that is used to tease out those portions of intelligence tests that contribute to *g*. Though Gould spent a great deal of time and energy trying to refute the mathematical basis of factor analysis, today after a great deal more work and substantiation it remains one of the main tools of psychometrics. Arthur Jensen's new book, *The *g* Factor: The Science of Mental Ability* covers this method in great detail, including some of the more recent advances. Where psychometrics is at today is not trying to determine the top strata of intelligence, or *g*, but in locating and defining the lower levels that contribute to it, for example fluid intelligence or crystallized intelligence, which are often claimed to be the two major strata below *g* (Jensen claims that crystallized intelligence is not a part of *g* but is learned or gained knowledge). Carroll concludes that, "The consensus of most investigators is that some kind of general factor of cognitive ability exists and that it can be estimated satisfactorily from currently available measurements."

Proposition 2 is, "All standardized tests of academic aptitude or achievement measure the general factor to some degree, but IQ tests expressly designed for that purpose measure it most accurately." In the debate about intelligence, aptitude tests used by schools and universities are often used as proxies for intelligence tests. Strict IQ tests are expensive and time consuming, but

standardized achievement tests can be used as a substitute for intelligence tests, especially when they are used on large populations for research purposes. But on the individual level for example, they will not uncover someone with dyslexia. Likewise, on the group level, if a particular school or program such as Head Start uses teaching to the test to raise achievement scores to try and show that intervention can raise intelligence, this proxy will not hold. It is only valid under normal learning conditions. That is, if you take one individual, and train them aggressively in vocabulary, to the detriment of other academic skills that are not as represented on tests, they will score higher than their intelligence would warrant. Carroll states, "The IQ score expresses the relative degree of progress attained in comparison with the progress achieved by the typical or [average] individual in a culture. Because, over historical time, the average levels of progress attained by individuals in a culture can change--upwards or downwards, but usually upwards--the average IQs can change as well, as documented, for example by Flynn." So again, intelligence is the engine that allows learning to occur, it is not learning itself. What is important here is that schools and intervention programs may teach to the test to increase academic scores, but an employer will still want employees that have a high intelligence so that learning can continue on the job. On the job, there are not teachers available to pound knowledge into your head as needed. It must be acquired by the individual. Education is fine, but without the engine of learning function at a high level, on the job acquisition of skills will suffer.

Proposition 3 is, "IQ scores match, to a first degree, whatever it is that people mean when they use the word intelligent or smart in ordinary language." This is similar to our reliance on what we all perceive to generally be attractiveness or beauty, with some personal tastes involved, and then one day along comes political correctness and it is denied that beauty pageants could possibly correlate with what we all perceive to be beauty. It is just a form of denial made to make one group feel equal to another (therefore create more forms of intelligence such as Gardner's). To understand intelligence is to recognize not some trait or sum of traits like conscientiousness or shyness, but as the cognitive engine of knowledge gathering. Behavioral traits are located in the more primitive limbic brain system, while intelligence evolved in the higher cortical region. Evolution wants to maintain different traits to take advantage of different environments, much like mixing up the genes of the immune system so that some individuals will survive any pathogen the group comes in contact with. But intelligence does not work at the same level. It is the efficiency with which an individual can learn and adapt, and it is always valuable to survival for the most part (under Pol Pot and the Khmer Rouge, being stupid seems to have incurred some survival benefit, but only from other humans, never from nature).

Carroll states, "To summarize: Experts have largely neglected what seems to be an obvious conclusion to be drawn from the evidence from IQ tests: that IQ represents the degree to which, and the rate at which, people are able to learn, and retain in long-term memory, the knowledge and skills that can be learned from the environment (that is, what is taught in the home and in school, as well as things learned from everyday experience). Children with high IQs rather quickly attain mental ages well above those of their age peers, and they maintain competence

over many years, whereas children with low IQs are much slower in learning what the environment exposes them to, and they are deficient in retaining what they learn. Differences in IQ among adults are the resultant of these differences in learning rates over the years of childhood, adolescence, and later on. To the extent that people can judge the degree to which others can learn and retain those knowledges and skills offered to them by the environment, the general factor g does indeed correspond to what people conceive of as intelligence or being smart. It would be highly useful to pursue research devoted to obtaining more details about people's concepts of intelligence and the extent to which those concepts correspond to what is measured using different kinds of intelligence tests. Even more useful would be research on the degree to which g corresponds to people's rates of learning different kinds of tasks or tasks of different degrees of complexity."

Proposition 4 is, "IQ scores are stable, although not perfectly so, over much of a person's life." Obviously it is difficult at the present time to test the IQ of infants and find that they correlate well with intelligence as an adult. But IQ at the age of one does correlate well with an individual's IQ as an adult, and as passive intelligence tests improve, psychometricians will get better at determining a person's eventual IQ. And of course this is what is really important, what will a person's IQ be when they enter the work force, given that they have acquired as good an education as can be expected for an average person? And this also begs the question, if IQ cannot be improved through education, then what are the real questions we must ask about schools that are failing? Is it the school or the intelligence of the student body? And this of course is the real policy dilemma. If the scores cannot be raised, to agree with normal intelligence scores over the long haul, then group differences cannot be eliminated by education alone, and its back to the drawing boards for social interventionists who cannot tolerate natural group diversity (versus cultural diversity which is held in high esteem).

Proposition 5 is, "Properly administered IQ tests are not demonstrably biased against social, economic, ethnic, or racial groups." Achievement tests, used as proxies for intelligence tests, have to be verified and checked using more rigorous IQ tests, usually through sampling methods. That is, giving some people more rigorous tests to see if they correlate with achievement tests to give the relative IQs of different groups. There have been numerous attempts to show that testing can be influenced for example by telling the group that it is to see if they are inferior, or some other such nonsensical stressor. Or trying to show that some groups just try harder than others. But research has shown none of these to be valid over the large number of studies performed. And again and again, groups properly identified continue to test out at different IQ averages, such as Jews at 117, whites at 103, and blacks at 85. These numbers have been remarkably constant regardless of how Gould and others have tried to distort the history of psychometrics. And today, bias is no longer an issue outside of folk psychology as practiced by the media.

Carroll states, "This proposition, also, is well supported by massive evidence from psychometric studies, as summarized and extensively discussed by Brody (1992), Jensen (1980), and others.

The bottom line is that IQ scores from most standard tests of intelligence correctly assess, within small standard errors of measurement, the individual's amount of progress, relative to his or her age cohort, in achieving the mental proficiency that it is possible for one to attain in an advanced culture such as ours. To the extent that such scores can predict success in school, in a training course, or in an occupation, they tend to make similar predictions for different social, economic, ethnic, or racial groups, regardless of the fact that average scores for those different groups may differ for one or more reasons. Agencies that construct and develop standardized tests of intelligence or scholastic aptitude make every effort to minimize bias in such tests."

Proposition 6 is, "Cognitive ability is substantially heritable, apparently no less than 40 percent and no more than 80 percent." Carroll defers this issue to Plomin and Petrill's article in this same issue of *Intelligence* as well as Rowe's article. Suffice it to say, that Carroll is hoping for another explanation other than genetics for the resultant disparity between the white and black IQ means. And this is exactly where psychometrics is at today. For the most part, *The Bell Curve* has been vindicated on all accounts outside of policy recommendations except this one. Can science find a reason that is an environmental cause for group IQ differences? So far, little has been shown for their efforts while genetics is moving to displace nurture as the fundamental cause of between group differences.

Genetics and Intelligence: What's New? By Robert Plomin and Stephen A. Petrill (P&P). P&P explain in their article how the pendulum has swung between nurture and nature over the last 100 years. Most of it I was familiar with except for the swing towards nature in the 1970's that was ended when Arthur Jensen wrote an article in 1969 that stated that the evidence showed that intelligence was inherited and the well recognized difference in IQs of blacks and whites was at least partially genetic. But the difference now is that after publication of *The Bell Curve* and Arthur Jensen's latest book (1998) *The g Factor: The Science of Mental Ability*, the pendulum according to P&P is no longer swinging but has settled between nature and nurture under a new paradigm that sees the individual as an emergent being, using genetic innateness to carve out its own individual niche, independent of cultural direction. They point out that twin and adoption studies over the past several decades have provided powerful tools to determine the heritability of many behavioral traits as well as intelligence, with intelligence being the most studied trait.

In an article entitled *The Genetics of Cognitive Abilities and Disabilities* by Robert Plomin and John C. DeFries in *Scientific American* in May of 1998, Plomin repeats much of what he states in the above 1997 *Intelligence* article. What is so surprising is that *Scientific American*, being a staunchly left leaning publication, has finally stopped calling such research pseudoscientific. There comes a time when the most ardent ideologues must admit the obvious, like the Catholic Church accepting evolution under the weight of scientific evidence, and another paradigm has finally established itself as legitimate and beyond reasonable doubt, that behavior genetics is real and here to stay. In this article, Plomin and DeFries state that psychologists have come to accept the role of genetics in intelligence, that heritability increases as a person gets older, and the family environment has little eventually to do with one's intelligence as an adult. The policy

implications of such findings are enormous. Educators must stop deluding themselves into thinking that what children learn is merely a factor of how much effort is put into teaching. Children are their own masters, they will learn at a pace that is consistent with their own abilities, and they are much more self-directed and self-differentiating than what has been assumed by educators. To understand the knowledge acquired by students means we must recognize what is used to acquire that knowledge, raw intelligence. The authors state, " It appears that genes may have almost as much effect on school achievement as they do on cognitive abilities. These results are surprising in and of themselves, as educators have long believed that achievement is more a product of effort than of ability. Even more interesting, then, is the finding from twin studies and our adoption project that genetic effects overlap between different categories of achievement and that these overlapping genes are probably the very same genetic factors that can influence cognitive abilities. This evidence supports a decidedly nonmodular view of intelligence as a pervasive or global quality of the mind and underscores the relevance of cognitive abilities in real-world performance. It also implies that genes for cognitive abilities are likely to be genes involved in school achievement, and vice versa."

Why g Matters: The Complexity of Everyday Life by Linda S. Gottfredson. Gottfredson takes up the issue of what intelligence means in school, on the job, and in one's life. It is often dismissed by those who reject any genetic contribution to how one's life turns out, but to deny is not to make it less real. Intelligence, in this society, may have as much importance as say physical strength and stamina may have had 10,000 years ago. It is just what happens to be in demand today. (For a much more thorough treatment of this issue see Earl Hunt's book *Will We Be Smart Enough?*, 1995.) Gottfredson states, "By importance I mean functional importance. For example, to what extent does being brighter typically enhance academic achievement or job performance? To what extent will a firm's aggregate worker productivity rise if it selects brighter employees? My concern here is thus with the impact of actual capabilities, not with people's perceptions of their existence, utility, or moral value. Intelligence is viewed here, not as a virtue in itself, but as a means to commonly valued social ends."

She also details what has happened thanks to the civil rights laws and regulations. As corporations and white America was attacked for disparate outcomes in job selection (that is by hiring the most intelligent resulting in far fewer blacks being hired than were in the general population) the issue of intelligence and its meaning in the workplace has been researched as never before. Prior to civil rights, companies used whatever tests they needed to hire the best. But when minorities yelled "foul!", companies went back to work looking again at what made up a good employee, as required by the courts, to make sure there was no racial bias in selection. Because of this research, we are once again more confident that intelligence counts more than anything else, followed only by conscientiousness, a common behavioral trait. The new research shows a very high correlation between job performance and IQ, both by supervisor evaluation and an even higher correlation when actual output is measured. General intelligence or 'g' does matter, and it matters a lot, contrary to what the media and many social scientists would have us

believe. Thanks to attacks by the left over the last few decades in the area of civil rights, researchers looked again at what was once accepted without question because it worked. If you wanted to hire an employee that could think and learn for themselves, could generalize, and not require continuous training and instructions, then hire an intelligent person. From this research it seems safe to presume that a company might be well advised to look for innately intelligent people that chose for what ever reason not to go on to college. They are out there, many of them friends and acquaintances, and it never fails to impress me how many of them did better than those who went on to college, only to end up competing with other college graduates. While some of the more successful people are those who went into occupations where college graduates rarely enter, only to make a lot of money because they stood out cognitively. And since researching the issue of intelligence, whenever my wife and I go through a check out at the store, we can easily discern the smart ones that not only are quick but are having fun with the job. At the same time, many of the dull clerks are laboring, disinterested, and unable to perform to the obvious level of the more intelligent. I then reflect back when I worked at a grocery store. I took pride in being able to pack a bag of groceries in a logical manner, quickly. It was a challenge, a puzzle. No job is without its cognitive challenge if one is smart enough to apply higher intellect to make the time pass faster. Gottfredson then goes on to explain why intelligence is much more than education, which is a fundamental policy issue that needs to be redressed. We are beating ourselves up over educational failures, while we may be doing the very best job we can with the intellectual potential of some of the students. If they cannot be taught they will not be taught. She goes on to show how even high level executives who grew up with undiagnosed dyslexia and did not acquire good reading skills nonetheless make outstanding decisions. Their high intelligence allows them to learn and to generalize on the job, where it counts. Education may be highly over rated, as is experience. She notes that experience has "weak to moderate effects on job knowledge and task proficiency." I might add that along with affirmative action there has been a corresponding dumbing down of education with a subsequent increase in credentialism. By getting a degree, by any means possible, some people hold themselves out as being equally qualified as any one else with a degree, even if they are of much lower intelligence. We are now seeing a similar attempt by academics and politicians to supplant merit with quotas. To get into college in Texas, after the courts restricted selection by race, it has been proposed that the top 10% of every high school graduating class be allowed to go onto college, no matter how smart they are. It is easily recognized that as school districts have become segregated that this is an easy way of flouting the law and reintroducing race based selection. Nothing it seems will stop those who continue to ignore the average differences in intelligence between whites and blacks. Any social program, no matter how unfair, will be used to make everyone equal at any cost.

Gottfredson goes on to explain, "Additional evidence of the causal importance of g is provided by the many unsuccessful efforts to eliminate or short-circuit its functional link (correlation) with job proficiency. For example, there have been efforts to train the general cognitive skills that g naturally provides and that jobs require--such as general reading comprehension (which is important for using work manuals, interpreting instructions, and the like). Another approach has been to provide extra instruction or experience to very low-aptitude individuals so that they have

more time to master job content. Both reflect what might be termed the training hypothesis, which is that, with sufficient instruction, low-aptitude individuals can be trained to perform as well as high-aptitude individuals. The armed services have devoted much research to such efforts, partly because they periodically have had to induct large numbers of very low-aptitude recruits. Even the most optimistic observers have concluded that such training fails to improve general skills and, at most, increases the number of low-aptitude men who perform at minimally acceptable levels, mostly in lower level jobs." She then goes on to explain how intelligence is highly stable and cannot be altered by intervention specifically designed to improve it. In addition, it seems the media and many academics continue to ignore the many decades of research undertaken by the armed forces. Unhindered by a lack of funds, they have made some of the most revealing discoveries with regards to training versus general intelligence.

When President Clinton held one of the first of his dialogues on race he asked a panel member about affirmative action and the military, pointing out how successful it was. To my knowledge, no one caught the irony of such an assumption. The military, unlike the private sector, discriminates based on race right up front. They do not allow low intelligence recruits to enter the military. The lowest intelligence levels allowed are Army 85, Marines and Air Force 88, and the Navy 91! And what does this mean for affirmative action. Well, taking the army for example, over half of all blacks do not qualify with an average IQ of 85. All one has to ask is why is it alright for the Army to discriminate based on intelligence, but a business can't? Why the double standard? And using the same statistical data, the Navy is allowed to eliminate 65% of all blacks from consideration (that is, 65% fall below the 91 IQ cut off). So why wouldn't affirmative action work in the military, it bears no resemblance to affirmative action as imposed by the Government on others! If you allow me to select only those with a higher IQ, as the military does, no other selection criteria is as relevant or as meaningful for a corporation or for higher education. Gottfredson then quotes other researchers, "Laurence and Ramsberger (1991, pp. 146-147) were more skeptical about the future of low-aptitude men in the military: 'The reluctance of the military to accept these men, let alone keep them, appears to be steadfast. Higher quality recruits are easier to train and retrain and show greater promise for moving up the ranks and leading others as noncommissioned officers. Defense downsizing as a result of the thawing of Cold War tensions further removes the likelihood of increasing, and may even reduce, reliance on low-aptitude youth. . . No one seems to want people of low-aptitude, at least for long.'" But at the same time, the message for American industry seems to be that education and training will make it possible for everyone to be equally productive. The lessons well learned by the military are virtually ignored by academics and policy makers. They want companies to do what the military frankly says is too costly to do, try to train the cognitively challenged to perform at an acceptable level. It can't be done in a cost effective manner. And the reason for this is quite simple, "Although researchers disagree on how they define intelligence, there is virtual unanimity that it reflects the ability to reason, solve problems, think abstractly, and acquire knowledge. Intelligence is not the amount of information people know, but their ability to recognize, acquire, organize, update, select, and apply it effectively. In educational contexts, these complex mental behaviors are referred to as higher order thinking skills."

So g matters because it permeates everything we do. The level of education we can attain, the jobs we can perform and the value we bring to an employer, and how well we deal with the myriad of life's social challenges from shopping wisely, to voting, to not getting into trouble as often as someone that is less intelligent (there is no truth that there is such a thing as street smarts, only some smart people that end up on the streets). Gottfredson states, "The effects of intelligence--like other psychological traits--are probabilistic, not deterministic. Higher intelligence improves the odds of success in school and work. It is an advantage, not a guarantee. Many other things matter. However, the odds disfavor low-IQ people just about everywhere they turn. The differences in odds are relatively small in some aspects of life (law-abidingness), moderate in some (income), and large in others (educational, occupational attainment). But they are consistent. At a minimum (say, under conditions of simple tasks and equal prior knowledge), higher level of intelligence act like the small percentages (2.7%) favoring the house in roulette at Monte Carlo--it yields enormous gains over the long run. Similarly, all of us make stupid mistakes from time to time, but higher intelligence helps protect us from accumulating a long, debilitating record of them."

Finally, Gottfredson argues that the future will make intelligence even more important. Society is becoming more complex as we enter the information age. Manual labor is being replaced with machines built by the highly skilled. And expensive machines, many of them using robotics and artificial intelligence will demand intelligent people operating them, if only for emergencies when things go wrong. This all adds up to less demand for less intelligent people, while the more intelligent can name their price. Is this why we are seeing a greater separation of incomes, as intelligence becomes more in demand? The new workplace will demand those with higher order thinking skills, and social policy must come to grips with this reality. Some have held out hopes that the average IQ is increasing (the Flynn effect) and yet not many researchers in this field are exploring ways to exploit this phenomena. If it has any merit, it is more akin to the increase in stature due to health improvements. But no one really expects the trend to continue. And there has been little evidence that it has increased the number of scientists and doctors. If the effect is real, it has done little to increase the number of intelligent people, or to reduce the welfare roles. Perhaps more realistically, Gottfredson warns, is a dysgenic trend that will lower the overall intelligence. For example, in the black community the more affluent families are having far fewer children than those less well off or on welfare. This does not bode well for a nation in need of more smart people, and especially for a group that is struggling to catch up.

A Place at the Policy Table? Behavior Genetics and Estimates of Family Environmental Effects on IQ by David C. Rowe. Since the beginning of social intervention, sociologists have attempted to change the way children turn out by trying to find what makes them what they are. Now, behavior genetics is finally providing answers where sociology only wasted money on one program after another, trying to change us. Rowe outlines how a new metatheory of learning is changing how we view childhood development, by using new statistical tools to tease out those factors that have a real impact on development. But before I get into his article I must make note of a wonderful book by Frank Sulloway entitled *Born to Rebel: Birth Order, Family Dynamics,*

and *Creative Lives* (1996). In his book he details how differences between children occur within the family unit, based on a neo-Darwinist analysis of children finding their niche. For anyone fascinated or even skeptical of Rowe's perspective, *Born to Rebel* is a less statistical description of family dynamics and well worth the time.

What behavior genetics is finding out, again from statistical analysis of twin studies, adoption studies, longitudinal studies, etc. is that as children grow older they are less and less influenced by the shared environment of the family and will tend to make their own environments for two basic reasons--to find their own niche and to express themselves in a way that is compatible to their own innate nature. With intelligence, this means that as children grow older, parental influence diminishes as children follow their own paths and trajectories. Smart children will find their own cognitively challenging niches to express themselves and learn, and stupid children will rebel or take up less intellectual pursuits, perhaps turning to crime or sports, depending on the friends they run with. But one thing is sure, family influence takes a back seat to what the child sees as their own wants and desires, no matter how much parents try to make their children into what they want them to be. And this is especially true when it comes to intelligence. Rowe states, "for working- to middle-class families, the shared environmental effects on IQ in childhood seem to be temporary rather than lasting." He explains that the passive exposure theory of intelligence, that assumed that children were passive receptacles that received whatever knowledge the family and the schools poured into them, is no longer valid. It is invalid because "first, exposure is not the sole determinant of what individuals learn, and, second, individuals create different learning opportunities for themselves." And later, "The interpretation of cognitive growth as a genotype-driven selection of experience may explain a puzzle. As children grow up, the heritability of IQ increases from about 0.4 in early childhood to about 0.8 in old age. The genes that one inherits become a more and more accurate guide to one's level of developed phenotypic IQ, which depends on education, both in and out of school. This can happen if people select those environments that feed their intellects and avoid ones that are too difficult. The child who catches on to arithmetic quickly wants more; the one who finds it difficult wants less. Too little academic challenge is boring, too great, frustrating [genotypes drive experience]. Ironically it is the behavior geneticists who have most strongly embraced the active organism view of development [finding one's niche]."

This new research makes another interesting assumption invalid. We are told that Asian and Jewish children do well in school and are intelligent because of the family influence. Now we know that this may well be true when they are young, but that when they grow older it must be achieved on their own as the shared environment effect shrinks to zero. The family may help them learn when they are young, but their own innate intelligence will make them outstanding students or not (see my article on this web site on how the Jews became so intelligent). In effect then, shared environments should induce behavioral resemblance among siblings, while nonshared environments contribute to dissimilarity. As children grow up they differentiate themselves from the family unit and from their own siblings in an effort to become unique (niche-picking). The presumption that the family that prays together stays together may be true,

but some of the siblings may rebel against religion altogether, especially as the family size grows (again see Sulloway). But the real social policy impact is that neither family nor schools will have much effect on one's intelligence when it is really important, when you enter the work place. Entering with more knowledge and more credentials may give one a leg up, but in the end work performance will be based more on raw intelligence (along with adequate knowledge and skills) and drive (or conscientiousness). The individual is ultimately responsible for where they end up, given their natural tendencies, some luck, and hard work. So improving the family environment does not seem to be the solution to children not learning in school. It is more likely that the students in a school that does poorly educating children may just have stupid children that they are trying to educate. The military has accepted that fact for over 50 years now, but the rest of society refuses to look at the facts, continually coming up with new theories and costly interventions to make children learn more, and hoping that it will prepare them for citizenship and success.

And how about the nonshared environment? Rowe explains, "Now, some systematic nonshared environmental influences have been proposed, for example, birth order or birth spacing. Such variables make little contribution to IQ variation, however. Although new statistical methods can be used to identify nonshared effects, for the most part, we do not understand them, and some specific ones may not be practically modifiable. In particular, I do not believe that rearing influences that have been rejected as strong shared effects will emerge as strong nonshared ones." But the bottom line is that society will not close IQ gaps by improving the shared environments of some families over others, for example providing an Internet connection for poor families will not change their children's IQ. More likely, genes will continue to be the dominant factor as this story unfolds, with some variation between family members due to environment that is within the family unit and not easily addressed by intervention programs. Rowe goes on to explain, as many other researchers have, how intervention programs have all failed to raise the IQ of children that lasted into their teens. Only one study of an intervention program has shown an improvement in intelligence. The problem was the program directors kept testing the children over and over again using the same test. That is, they were teaching to the test, making the study results invalid. All other studies have shown that preschool interventions and adoptive family research studies both produce temporary effects on intellectual growth that are not sustained as children grow up. And one thing is certain, knowledge acquired in school will not be adequate to deal with all the workplace requirements in a fast changing technological world without innate intelligence to deal with change and diverse situations. Schooling can only do so much. Intelligence allows the smart worker to keep learning and adapting to benefit herself and her workplace value.

You may have noticed at the beginning of this article that Rowe did not include poor families in his conclusions about inheritance and intelligence. This is due primarily to the fact that adopted children are not normally placed in poor families and there is a dearth of poor families in longitudinal studies. This is a fact of research, some segments of society are harder to get information on than others for various reasons. Today, the common liberal belief is that if only

the urban poor could be given adequate resources, they and especially their children would somehow break the cycle of poverty. But Rowe pointed out one interesting study showing rural cognitive abilities were more depressed than those in urban communities, when other variables are held constant. This seems to indicate that urban environments are not as detrimental as rural environments. And yet we seem to be focused almost exclusively on the poor performance of inner city schools. Again, it seems to suggest that it is the quality of the students rather than the quality of the environment that is the primary cause of failure.

Rowe also tackles the issue of race and ethnic differences in intelligence. He repeats the oft recognized standard deviation between whites and blacks that has endured for over 100 years, but new tools are coming forth to provide better answers of why this is so. The numbers most often heard are 117 for Jews (in America), 106 for Asians, 103 for whites, 89 for Hispanics, and 85 for blacks. There is little debate that these numbers are real and the Armed Forces Qualification Test data bears this out. But until recently, most scholars would only admit privately that they recognized that about half of the intelligence disparity between groups is due to genetics. We do not live in as free a country as many of us assume when academics must lie publicly about what they know to be a fact: whites and blacks differ significantly in intelligence and a good portion of that difference is most likely due to genetics. Rowe then goes on to explain how the "two realms" hypothesis has dominated the social sciences, possibly wasting billions of dollars on programs that are failure due to a bankrupt theory. The theory assumes simply that developmental processes are different for group means than they are for individual differences. That theory can no longer be sustained.

Rowe explains that, "Developmental influences should apply only to individuals, one at a time, not to groups. Groups do not 'receive' any developmental influence as a unit--group names are abstractions, not recipients of developmental processes. Hence, a group mean on a trait would be merely an average of the different developmental influences experienced by individuals within the category; there would not be 'group-specific' developmental processes. Consider any variable assumed to create minority versus majority group differences in IQ: Would it affect individuals differently within these groups? Think for example, of racism directed toward individuals who are more African American in physical appearance. The range of darkness of skin color and 'Africanness' of facial features is enormous within the Black population in the United States, all the more so because of the considerable mixture of genes of African and European origins in African Americans. If racists pick on individuals who appear more 'African,' then this bias would create variation in exposure to discrimination among lighter and darker skinned African Americans. Also, some Black individuals may have little contact with Whites and thus less opportunity to encounter racism directly; some may be more sensitive to criticism than others; some may have, by chance, been victimized more hurtfully. Hence, the degree of 'exposure to racism' should create individual variation in any trait it affects, in addition to affecting group means. Although African Americans were used in this example, the logic would apply to any physical feature that distinguished a minority group. In a sophisticated cultural explanation of racial and ethnic differences, Ogbu (1987) recognized that the existence of

variation implies that not all minority members experience the same degree of stigmatization or discrimination. Ogbu wrote: 'Of course, not everyone feels this way. Some Black Americans do not identify with the oppositional identity and cultural frame of reference; some do so only marginally' (p.165). Or, in another article, Ogbu (1994) attributed the academic success of some African Americans to their ability to disguise their academic work and perseverance by various strategies that deflect attention away from their achievements (e.g., by accepting the role of class clown). In summary, minority-unique developmental processes that have been postulated (e.g., racism, minority-unique values, see Helms, 1992) should differ in psychological strength from one individual to another, either because one individual is more exposed than another, or because one individual resists the psychological influence more than another. As such, they should contribute both to individual variation and to group means."

Rowe and others then proceeded to run the numbers on minority-unique determinants of traits from numerous studies, using covariance matrices. Their conclusions from the analysis showed that only "one set of developmental processes" occurred within these populations. That is, there is no factor X that influences blacks or any other groups differently than others. We are all pretty much the same. No one group has a monopoly on some unique adverse conditions that effect the whole group in some mysterious way to make them less intelligent than others. It all keeps coming back to innate intelligence as the most parsimonious explanation for black failure in cognitive abilities. But what is really exciting about all this research is that it is made possible by recent advances in statistical analysis called structural equation modeling. What is happening in social science research, and especially in behavior genetics, is that every time new mathematical tools are developed they are applied to existing studies to obtain more data never before revealed.

Finally, Rowe concludes that "Behavior genetics says something about 'what is,' about the processes that create variation in psychological traits in our natural environments. Genetic processes are a powerful source of variation in IQ and in most other psychological traits. Excepting perhaps children who live under extremely adverse circumstances, the family environment makes a negligible contribution to IQ variation in adulthood; similarly, it also makes little contribution to variation in most adult nonintellectual traits. The genetic variation in social class levels themselves reflects the role that heritable traits like IQ play in social mobility between generations. Similarly, because family environments exhibit parents' behavior, variation in them is also heritable to a large degree. The covariation of parental and child traits, traditionally interpreted by social scientists solely as an 'environmental effect,' is mainly mediated by genes held in common by parents and their offspring. Clearly then, genes are a source of social inequality to the extent that genetically based traits may contribute to social success and failure.

Now, some new technology might produce greater environmental changes in IQ. Nonetheless, most evidence would suggest that recreating the environments of professional-class families and schools for children who have inherited genes unfavorable toward high IQ, will make little

lasting difference in their IQs. Because most early intervention programs are not radically new, but are in the mold of advantaged families and good schools, they probably promise, at best, only modest gains, at least for less environmentally malleable traits like IQ. As social scientists, we should be wary of promising more than we are likely to deliver. Physicists do not greet each new perpetual motion machine, created by a basement inventor, with shouts of joy and claims of an endless source of electrical or mechanical power; no, they know the laws of physics would prevent it. Likewise, the negligible family environmental contribution to IQ in adulthood prevents any dramatic reduction in IQ variability, at least with the interventions known today. Indeed, the more we improve environments for children's intellectual growth, the greater the genetic component in the remaining variation. In Sweden, a country without the urban ills seen in the United States, tremendous IQ variability remains attributable to genetic variation. In an ironic sense, a high adult heritability of IQ could be seen as evidence of a social good, that is, of the successful elimination of much environmental inequality.

Social scientists, I think, should be more circumspect, like physicists, and view claims of new ways of raising IQ with a healthy skepticism. They should be aware of the weight of evidence in the fields of psychometrics and behavior genetics, although not as immutable as laws of thermodynamics that sets a background against which new ideas for changing IQ should be evaluated. They should also adopt the 'active organism' metatheory, which now undergirds much of the science of human development."

Incorporating General Intelligence into Epidemiology and the Social Sciences by David Lubinski and Lloyd G. Humphreys. Every day it seems we hear about how blacks suffer medically from discrimination and racism. It is just assumed, without evidence, that any differences in life's outcomes must be because of what happened TO them rather than WHO they are. Everyone is different, and evolutionary principles dictate that population groups under differing selection pressures BE different in the end. But aside from genetic reactions to life, including "one gene one disease" conditions like sickle cell anemia and cystic fibrosis, intelligence alone can make the difference in the way someone orders their life and the outcomes that follow. Lubinski and Humphreys' article explores the correlation between intelligence and the cause of disease beyond single gene occurrences. They state in their abstract that "The purpose of this article is to demonstrate the value of examining a variety of pressing behavioral, medical, and social phenomena as they relate to gradations in general intelligence. Although few (if any) variables in the social sciences can compete with the construct of general intelligence in its ability to forecast an array of socially valued attributes and outcomes, measures of general intelligence are seldom incorporated into correlational and experimental designs aimed at understanding maladaptive behavior (e.g., crime, dropping out of high school, unwise financial planning, health-risk behaviors, poor parenting, and vocational discord) or its opposite, highly adaptive behavior. We contend that, if consulted more often, the construct of general intelligence would contribute to understanding many puzzling human phenomena, because successive gradations of intelligence reflect successive degrees of risk. A method is provided for uncovering group trends, one expressly designed to reveal the range and prevalence

of the many different kinds of human phenomena that vary as a function of intellectual gradations. By employing this method, policymakers and the public can more readily apprehend the significant, but often unsuspected, contribution made by general intelligence to many socially important outcomes. Our approach is similar to traditional epidemiological research aimed at ascertaining antecedents to maladies through the defining features of high-risk groups (e.g., for lung cancer, smokers and passive smokers; for AIDS victims, participants in unsafe sex; for academic mediocrity, among the intellectually gifted in nonaccelerative educational tracks; for mental retardation, high blood-lead levels). Once such high-risk groups are defined (i.e., groups of persons whose behavioral dispositions predispose them, and often others around them, to unfortunate outcomes), policymakers and scientists are in a better position to disentangle genuine causes from families of correlations and can concentrate ameliorative resources more effectively. Data from educational and medical contexts are analyzed to show how measures of general intelligence, and other dimensions from differential psychology, can complement epidemiological and social science inquiry. We also argue that by incorporating such measures of human variation into policy development and research, policymakers are more likely to forestall 'iatrogenic effects' (maladies caused by treatment)." In short, intelligence is the fundamental human trait that will keep you well and productive, without it you will not have access to the good life as now defined by modern culture, even though living in poverty in the United States is a far better life than living in the middle class in many third world countries.

One disastrous aspect of affirmative action that does not get much attention is what happens when the medical profession is allowed to dumb down in order to get more black doctors into medical school. What happens when a profession as important as medicine is no longer held to the highest standards, and mediocre doctors are allowed to graduate and eventually kill patients because they are not intelligent enough to enter into a profession that requires high intelligence? It has been estimated that there are over 100,000 fatal injuries to medical patients each year. How many of those people die every year because of affirmative action's detrimental impact on medical schools, in the drive for diversity instead of good medicine? Lubinski and Humphreys' article addresses this tragedy (in the quest for egalitarianism and socialism) and others. Blacks cannot be qualified to become doctors, if they do not have the intelligence to practice medicine! Yes, some will be bright enough, but not enough of them with an average group IQ of 85. And former Surgeon General Elders should be a shining example of how almost anyone of color can become a doctor and then embarrass themselves with their own ignorance on how to present a more open doctrine to the American public. Ironically I agreed with her doctrine, but her presentation lacked intelligence.

So if intelligence is so important, why has it not been studied to the same extent as SES or other causes of black dysfunction and disease. Again to quote Lubinski and Humphreys "There is a rule in the philosophy of science called the 'total evidence rule'. It is not an abstruse or controversial theory of epistemology but rather a guideline for inductive logic that is quite uncontested. It holds that when evaluating the verisimilitude of a theory or the plausibility of a hypothesis it is incumbent upon the evaluator to take into account all the relevant evidence when

conducting appraisals. This sounds commonsensical, but the rule is frequently not observed. We believe that a sufficient evidential base has accrued to conclude that causal modeling, scale construction, experimental design, and building theories in the social sciences without regard to the considerable evidence on the wide relevance of general intelligence often constitutes a serious violation of the rule of total evidence. By violating the rule, one also commits a fallacy in logic--the fallacy of the neglected aspect--a fallacy in reasoning stemming from omitting relevant evidence. Castell explained the fallacy thus: 'In every case of Neglected Aspect, the general character of the argument is the same: true propositions, expressing relevant facts, are heaped up; but true propositions expressing equally relevant facts are omitted.' Such errors in reasoning surface in a variety of settings. Kuttner and Lorincz's (1968) reanalysis of the Coleman Report and our analysis of low-birth-weight babies exposed examples of both. Ignoring the possibility that general intelligence holds causal status for a variety of critically important behaviors is no longer scientifically respectable. We must answer questions regarding its scientific status empirically. We can no longer afford to say, 'You can study that, I'll study this.' It is too likely that whatever we are both studying is a covariate of general intelligence. In the following section, some designs underscore why it is important to examine general intelligence concurrently with wherever else we choose to study."

The social sciences has chosen to turn a blind eye to the cause of a myriad of social problems, and this stubbornness to include what is obvious to the casual observer is couched in political censorship because of concerns for the feelings of one group over another. White America has for many years observed a small minority of Ashkenazi Jews who have a far higher intelligence and reap the rewards of that intelligence without it causing any stress in the rest of society. Why can we not accept that likewise blacks are far less intelligent than other groups and deal with the facts rather than trying to hide them from policy considerations? These scholars are finally stating, openly and with incontrovertible evidence, that the facts can no longer be ignored without suffering a backlash from the rest of society. There are in fact only two excuses left, either they are less intelligent, causing dysfunction, or they suffer from racism at the hands of the rest of society. There is a preponderance of evidence for the former and none for the latter. It is time to apply the empirical rules of science to looking for and correcting the social harm that has come from forty years of scientific myopia and face the facts. It is no longer defensible to do anything less.

Everyday Life as an Intelligence Test: Effects of Intelligence and Intelligence Context by Robert A. Gordon. For many years intelligence has been subjected to testing, primarily in academics and for the workplace, to see how well people are suited for different tasks. Along with this testing has been an assumption that outside of these areas, different intelligences do not matter all that much. But this view is now being challenged through analyses of individuals and groups. Gordon states that the nontest items of intelligence, or how one conducts life is real and measurable. He looks at three levels of testing: the individual, the near context of individuals, and entire groups. He uses a population-IQ-outcome model to measure how much intelligence impacts life itself. And correlations and differences can be better analyzed and relationships

found when they are aggregated on the group level, such as differences in Black-White IQ's and the impact it has on how they conduct their lives. What he is primarily interested in is whether outcomes of juvenile delinquency, adult crime, single parenthood, HIV infection, poverty, etc. are due to the lower intelligence of different groups.

This model is a direct challenge to the failed standard social science model that circularly argues that first poverty causes crime, then crime causes lack of jobs, then lack of jobs cause poverty, one problem causing the next ad infinitum. But one thing is apparent, it is not lack of money that causes poverty and its ancillary problems so much as a lack of intelligence and a support community to deal with an ever increasing complex world. That is, in a black community where the norm is low intelligence, life is much more difficult than for an individual who happens to be of low intelligence amongst friends and relatives of higher intelligence to watch over the less bright members. This is missing in the inner city slums where few have the intelligence to comprehend the world around them. Intelligence, is in fact the ability to deal with complexity, in all aspects of life. When one does not even know where the welfare check comes from, nothing else in life is going to be easy either.

It is still readily accepted in many academic circles, and much more so by the media, that low socioeconomic status (SES) is the cause of all of the above problems in life. But after years of work, the correlations only make sense if intelligence is ignored as an alternate cause. It is now believed that in fact intelligence is a cause of SES, not SES a cause of IQ, poverty, etc. If intelligence is highly inherited, how can SES account for more than a small change in general intelligence. As long as intelligence was assumed to be highly malleable, this false paradigm could continue blindly ignoring psychometrics and the large and consistent disparity between White and Black intelligence as a cause for differences in poverty. But that assumption can no longer be made. For example in crime the within-group differences are much less than the between-group correlations. Black-White ratios of crime are three to five times greater for Blacks. And what is truly ironic is how the multiculturalists are always trying to advance the concept of diversity, while trying to eliminate or homogenize societies differences in intelligence. Just what does diversity mean to them? Just skin color, cultural artifacts, or what? It seems to again be of hollow meaning when it eventually is decoupled from its real intent, to bash and denigrate white Europeans because some how we have become the new enemy.

There is a stratum of society that reads less, sees less, hears about less, travels far less, shows less interest, and is almost impossible to reach with positive information. Given this, how can it even be expected that the underclass is capable of even casting a meaningful vote, that is a vote based on analysis and recognition of the political process. They are out of touch and do not have the intelligence to understand the issues nor who is taking advantage of them or helping them. This stratum is caused not by poverty so much as the fact that for a myriad of reasons, and human nature being one of them, people of similar intelligence migrate together. Gordon writes, "The incongruous fact is that gifted individuals happily relinquish any advantages they might command in average settings to place themselves among peers who are equally advantaged

intellectually. Is this elitism or egalitarianism?" And so society naturally stratifies by intelligence, and that is reflected in a class stratification. Marxist dogma believes it is based on class struggle, but the struggle is with the level of cognitive ability it takes to rise to the top or fall to the bottom, and is a direct result of our advanced technological society. It wasn't planned that way, it just happened. Intelligent people have far more value than less intelligent people, and people of low intelligence have a negative value. Low intelligent people as a group bring no value to the collective good, and that is a horrific reality that lies outside of politics and is grounded in the realization that the underclass are merely recipients of wealth, with little to contribute in return. Gordon speaks of the principal of reciprocity, and how everyone is expected to contribute, "There are, however, limits on normal help. Karl Marx's famous slogan, 'From each according to his ability, to each according to his need!', was one of the most sweeping formulations ever of help as a policy, but it remained an ideal that never was implemented. Helping is supported by social norms ('It is better to give than to receive'), but help as a permanent solution to stubborn differences in intelligence of any size eventually runs up against 'the norm of reciprocity,' which is described as one of the principal components universally present in moral codes. Reciprocity 'serves a group stabilizing function' and furnishes 'one among many starting mechanisms' for social systems; its absence, therefore, can have important consequences. The norm of reciprocity obliges one to give roughly comparable benefits to those from whom benefits were received, and its clear violation risks being seen as exploitation. According to evolutionary theorists, reciprocity is demanded especially between genetically unrelated individuals. Although Gouldner allowed for relaxation of the norm in relations with children, the elderly, and "those who are mentally or physically handicapped," he failed to consider that differences in intelligence throughout the remaining range can often be large enough to pose formidable barriers to fair reciprocation between randomly paired individuals. Society solves this problem in part through the market system of economic exchange and its unequal remunerations, and in part by abhorring random pairing and thus creating relatively homogeneous substructures encapsulated within a diffuse sense of community and nation. Hierarchically arranged substructures, in particular, limit exposure to demands for help that can never be reciprocated, but simultaneously they also limit the quality of cognitive help readily available within structures low in the hierarchy." And this inequality of the upperclass supporting the lower class shows up over and over again. For example, males with an IQ below 85 are almost three times more likely be killed in a car accident than males with an IQ above 100. And of course again we have to pay the price. Should people of low intelligence be restricted from driving?

The separation or stratification between high intelligent and low intelligent people will continue to accelerate. Up until about fifty years ago, many highly intelligent people merely blended into the working class and never advanced, presumably many of them unaware that they were exceptional. Now, every student is encouraged to go as far as they can, and many more are entering college where they will find mates closer to their own intelligence. This assortative mating is correlated somewhere between .36 to .43. Interestingly, many couples still consider looks in their mates to be as important as intelligence thus introducing the "bimbo" factor in reducing assortative mating's impact on IQ alone. (Interestingly in the Jewish eugenic's program

that increased their IQ's to an average of 117, looks were heavily downplayed in favor of intelligence--see MacDonald.)

The bad outcomes of Blacks has been blamed on poverty and/or racial discrimination, but a more likely cause as Gordon has shown is a low general intelligence, "Is poverty to be understood as a continuous variable that is measurable, or as a virtually unanalyzable qualitative state so global that no set of measured variables seems to capture it adequately? According to the first view, 'poverty is most simply and clearly understood as a lack of money', a conception of the variable known as 'income poverty'. Improvements in specified variables such as income, however, often leave the dysfunctional behaviors they supposedly help explain, the so-called culture of the poor, little changed. Disappointments with variables that seem potent otherwise, such as income, years of schooling, and job training, have given rise to a more pessimistic, qualitative view of poverty. The qualitative conception of poverty, 'the seemingly intractable urban slum', is documented in statements such as the following: 'action at any one point on the poverty cycle would be useless without action at every point, to break the hold of an entire way of life'; poverty program participants could not be aided successfully 'until the whole culture [to which they returned] was transformed'; 'no spectacular breakthrough can be made until the whole structure of the culture of poverty is destroyed'. Such an indivisible qualitative state seems to demand an equally qualitative explanation, yet none has been suggested other than poverty itself. This recourse to poverty as its own explanation constitutes the cycle-of-poverty theory; born of desperation, the theory is perhaps no more than a thinly disguised tautology, and it fails to account well for why some individuals and groups have emerged from a history of impoverishment and others have not. The effects of general intelligence and the contexts it gives rise to may have the requisite pervasiveness to account for the widespread impressions of discontinuity and qualitiveness concerning poverty, while at the same time restoring continuousness and measurability to the explanatory variable." And later he writes, "In the social sciences, noneducational behavioral outcomes, such as criminal status, single motherhood, HIV infection status, and opinion status are often subjects of systematic inquiry. Theories based on motives, values, social learning, culture, social structure, economics (poverty), and power, with rare exceptions, have effectively dominated attempts to explain such outcomes. Investigations taking account of intelligence are relatively infrequent, and they have succeeded best in gaining a foothold where intelligence test data for individuals were available to be joined with individual outcomes in within-group models, as happened in the cases of delinquency and job performance. Attempts to add g to explanations of group differences have aroused more resistance. Herrnstein and Murray's (1994) *The Bell Curve* exploited an unusual data set that happened to include scores on a good test of g with records on a variety of individual outcomes, but reactions to their work have often been dismissive, as though their findings were merely empirical or incidental rather than possibly causal associations, and overstated at that if not the products of misanalysis. Ironically, Herrnstein and Murray's basic model is a within-group one, and thus typical of much sociology except for the respectful treatment given g. Hence, their measures of effect size often fail to convey the greater importance that g can assume at the population level. . . . The difference between the population-IQ-outcome model and the usual sociological approach to explaining race differences can be

likened to two different approaches to explaining the cracks that radiate from a single point of impact to a mirror. The traditional sociological approach notices the cracks and attempts to use some of them to explain the others. Explanation often begins at any point, and can conceivably go round full circle in either direction if followed through the hands of different theorists: 'one kind of pathology breeds another'. Pessimistic attitudes of teachers, it is alleged, cause low achievement, rather than vice versa. Poverty causes low IQ, rather than vice versa. Poverty causes crime, and crime causes poverty. Closeness of cracks, and their convergence toward the point of impact may lend special cogency to some attempted explanations. In tacit acknowledgment of confused efforts, sociological explanations have sometimes employed phrases such as 'the tangle of pathology' and 'chronic, self-perpetuating pathology' to convey the lack of any clear causal progression, for 'the roots of the multiple pathology are not easy to isolate'. Inevitably, metaphors such as 'poverty cycle' and 'vicious circle' are invoked. Not surprisingly, social scientists find themselves trying to counter the impressions that 'nothing works' and that an 'entire culture seemed impervious to modification'. The population-IQ-outcome model finds that population IQ differences can represent the single impact and thus explain many of the cracks heading away from it. Some historical explanations have represented efforts to sidestep the circle dance by identifying a single impact event, such as the period of slavery, that would account for the many cracks. An important difference between the legacy of IQ and the legacy of slavery, however, is that the former can be quantified and used to explain quantified outcomes, the latter cannot. . . Only poverty has reflected a limited success in reducing IQ commensurability, and that mainly because money and jobs can, to a certain extent, be redistributed. In fact Black-White differences in diverse outcomes could often be accounted for entirely (delinquency, crime, HIV infection, poverty, opinions) or almost entirely (single motherhood, values) in terms of differences in g distributions. Not only were these race differences predictable, therefore, they were often totally predicted by g distributions. When policymakers attribute such differences in prevalences to properties of the larger society [putative white racism] without regard to differences in the properties of the populations themselves [black low intelligence], there occurs a shift in emphasis from errors made by members of the population to errors made by the society or system that in itself constitutes a redefinition of deviance. Sociological labeling theories, which are more concerned with who defines certain outcomes as deviant than with what causes the behavior so defined, are a prime example of the shift in emphasis."

In conclusion, there is a wealth of data showing that the disparity in life's outcomes between Whites and Blacks and any other group is primarily intelligence. It is what makes one group prosper while another group fails. Too often this dichotomy is made between Whites and Blacks when the same difference in life's outcomes can be shown to exist between Gentile Whites and Jewish Whites. With an average IQ difference of 103 to 117 it reflects the similar difference in Black-White differences in average IQ of 85 to 103. And again, just as the difference in wealth between Whites and Blacks can be accounted for by the difference in intelligence, the tremendous success of especially the Ashkenazi Jews of amassing great wealth even while living within anti-Semitic societies shows that intelligence transcends opportunity, prejudice,

slavery, or any other social construct. If evolutionary theory has taught us anything, it has shown us that everyone tries to improve their reproductive success by any means necessary. Such concepts as institutional racism, the cycle of poverty, the legacy of slavery, etc. are all just excuses for what is obviously a difference in intelligence and a difference in what we would expect in plucking the fruit of life's treasures. Nature is neither kind nor mischievous, just "a blind watchmaker," tinkering with many different mechanisms.

The Evolution of Australian and Amerindian Intelligence

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Abstract

There has been continuous worldwide selection for intelligence, although its strength may have varied with climate. Intelligence gradually increased, as reflected in the sophistication of the human tool kits. This increase was caused by intelligence increasing mutations, followed by the spread of these mutations. These mutations occurred at approximately the same rate (per million population) on different continents, but in absolute number were most common in the Eurasian land mass with its high population. When Australia and the Americas were settled the original populations lacked certain alleles because the relevant mutations had not yet occurred, or because these mutations had not reached the relevant parts of Eurasia. After Australia and the Americas came to be isolated from the larger Eurasian populations, they did not receive further immigrants. Although, a few intelligence raising mutations occurred in their populations, the smaller Australian and American (Indian) populations implied that the total number of beneficial mutations was less than in Eurasia. Thus, the intelligence of the Australian and American aboriginal populations came to lag behind that of the rest of the world. The literature on Australian aboriginal intellectual performance is reviewed, being shown to be low as expected.

[Image]

In his survey of the intelligence of the world's peoples Lynn (1991) found that the highest levels were found in people that evolved in Eurasia (Mongoloids and Caucasoids), while low values were found for those that evolved in Africa (Negroids), and among those from the Americas and Australasia. Most of the discussion of causes for this has focused on the differences between the three major races, with little attention paid to the Amerindians and the Australians.

Among the few who have tried to explain the evolution of racial differences in intelligence, the most common explanation has been climate. These theorists have argued that the intellectual

demands of life in cold climates were greater than in warm climates. Lynn has placed emphasis on the intellectual abilities needed to survive cold, to build fires, and to hunt in groups. Miller (1991) has pointed to the need to store food to survive the winter and how this may have selected for intelligence. He has also emphasized the importance in cold climates of avoiding a mate who deceives promising continued provisioning that is not delivered, or accepting provisioning when the resulting children will not be those of the provisioning mate (Miller, 1995). Intelligence helps both in carrying out, and in detecting such detection. The implicit assumption in all such models of differential selection is that all populations had access to the genetic variation required for intelligence to evolve. Thus, intellectual differences between populations had to reflect differences in the strength of selection for intelligence.

The alternative to be presented here is that more of the mutations that led to high intelligence occurred on continents with large populations than on less populated continents (Australia and the Americas). The selective forces for intelligence were present on all continents, although quite possibly differing in strength. The continents where the most such mutations had occurred would have the highest average intelligence. With equal mutation rates throughout the world, the continental area experiencing the largest number of mutations would be Eurasia. The fewest would be experienced in Australia.

[Image]

Stylized Facts

There are several stylized facts (well established generalizations) that will be used in the argument.

1. Much of the current human variation in intelligence is genetic (Bouchard, 1993; Bouchard, et al, 1990; Jensen, 1980, Plomin, & Loehlin, 1989; Plomin, et al 1994; Plomin et al., 1995; Rowe, 1994). Behavior genetics research suggests that there is no single gene for intelligence. Instead, it appears to be affected by a large number of different genes. Wills (1991) suggests 50 genes, each contributing about 3 IQ points is of a plausible order of magnitude. Jinks & Fulker (1970, 2. 343) conclude that at least 22 loci seem to be controlling IQ. Later (p. 344), using data for inbreeding depression they conclude that about 100 genes seem to be showing dominance for high IQ.
3. There has been unidirectional selection for intelligence in most, if not all, of the world. It is not known exactly what selected for intelligence in the course of human evolution. That something did is indicated by the brain's steady increase in size with time, as does the steady increase in the complexity of technology revealed in the archaeological record (see below). The fact of inbreeding depression suggests that many of the alleles that contribute to low intelligence are recessive, with the alleles contributing to high intelligence being dominant. This suggests that the genes for high intelligence have been the subject of a continual process of directional selection (Jinks & Fulker, 1970, p. 343). Because directional selection acts very slowly in eliminating recessive genes, but quickly to increase the frequency of dominant alleles,

a high average level of dominance suggests long continued directional selection for a trait.

One view has focused on the external world, discussing factors such as tool use, hunting, gathering, throwing (Calvin, 1990), etc. This approach seems to have become less fashionable recently, possibly because environmental driven evolution would seem to imply that if the environments differed, the strength of selection for intelligence would differ. Since environments obviously differ, populations might differ in intelligence. This conclusion is unacceptable to many, although others have considered the possibility of this happening in response to climatic differences (Miller 1991, Lynn 1991).

Others have emphasized the selective pressures for greater intelligence that can be created by humans interacting among themselves. Alexander (1990) has emphasized competition among individuals, and the need to outwit ones fellow men.

Buss (1994, p. 34) reports that in a survey of 10,047 people in 37 nations concerning desirable traits in a mate, women ranked intelligence fifth out of eighteen traits. In a smaller list of thirteen desirable characteristics, intelligence emerges in second place worldwide. In ten cultures women ranked intelligence higher than men did. However, in the other 27 countries both sexes placed an equally high premium on intelligence.

It is not hard to explain why this preference for intelligent mates exists. According to Buss (1994, p. 34), "these are likely to include good parenting skills, capacity for cultural knowledge, and adeptness at parenting. In addition, intelligence is linked with oral fluency, ability to influence other members of a group, prescience in forecasting danger, and judgment in applying health remedies. Beyond these specific qualities, intelligence convey the ability to solve problems." Of course, in modern industrial societies, intelligence is correlated with socioeconomic status (Herrnstein & Murray, 1994; Itzkoff, 1994), and "in tribal societies the head men or leaders are inevitably among the most intelligent in the group." (Buss, 1994, p. 34). Of course, the leaders of a group usually have greater access to fertile females and the resources to raise them.

Buss (1994) also emphasizes how in human mating deception is often used. Men try to convince women that they have, or will have resources, and will devote them to the well-being of a particular woman and her children (and not squander them on other women and their children), while women try to convince men that they will be sexually faithful to them (while possibly seeking better genes from other men). Buss states (p. 155), "Because the deceived can suffer tremendous losses, there must have been great selection pressures for the evolution of a form of psychological vigilance to detect cues to deception and to prevent its occurrence. The modern generation is merely one more cycle in the endless spiral of an evolutionary arms race between deception perpetuated by one sex and detection accomplished by the other. As the deceptive tactics get more subtle, the ability to penetrate deception become more refined."

Miller (1995) has argued that the above selective pressures would be strongest in cold climates. In such climates, male provisioning is critical for surviving the winter. Males have an incentive to deceive females as to their long term reliability. Females use intelligence to deceive males as to their sexual faithfulness, and the paternity of their children. Both sexes are under strong selection for the intelligence required to avoid being deceived. In the tropics, where females can support themselves, the selective pressures for intelligence are not as strong.

Wills (1993) has emphasized also a possible role for sexual selection, titling one of his books *The Runaway Brain*. Once mates came to be selected on the basis of intelligence, or something produced by it (such as musical or conversational ability) there would have been unidirectional selection for intelligence with the most intelligent individuals having the best access to mates, and leaving more descendants.

It will be presumed that each individual has a equal probability of experiencing an intelligence raising mutation (regardless of the population they live in). This is standard genetic theory, since no population differences in vulnerability to mutations are known. Weakening this assumption would not change the nature of the argument. [Image]

The Steady Growth of Intelligence

There is evidence from archaeology that human intelligence has been steadily increasing.

The material culture of prehistoric man was at a very low level before the emergence of anatomically modern man, and gradually increased. The rate of progress was very slow. There were periods of tens of thousands to hundreds of thousands of years when the tool kits used by primitive hominids remained essentially constant.

This slow rate of progress is more consistent with biological evolution than with cultural evolution. If the populations had been similar to current populations in ability, it is likely that better methods would have been quickly discovered and adopted. The best way to explain the failure to discover and to adopt more sophisticated tools is that the population had not yet acquired the intellectual abilities needed to develop and use these methods.

A quick history of stone technology may be useful. Because organic material perishes, most of our evidence of early human intellectual achievements consists of the stone tools they left behind. The earliest tools are the Oldowan, which were extremely crude scrapers, choppers, and flakes, each being the product of a few strokes with a hammerstone, and are dated at about 2.5 million years ago. This persisted for about a million years. It was followed by the Acheulian industry, which represented only a modest advance. However, this did represent "the first tool in which a predetermined shape has been imposed on a piece of raw material" (Lewin, 1989, p. 114). The hand ax, which was characteristic of this technology involved two converging sharp edges, which "required the shape to be seen within the lump of stone, which is then worked

toward with a series of careful striking actions," (Lewin, 1989, p. 114). Constructing such "esthetically pleasing products of hours of skilled labor" probably required more intelligence than merely knocking two stones together.

Once developed the Acheulian technology persisted for over a million years. The most plausible explanation for the failure to adopt more sophisticated techniques is that the population lacked the intellectual ability to conceive of and adopt these techniques. If the population had the ability required to use a more sophisticated technology, surely it would have been invented and adopted within a million years.

About 150,000 years ago, change accelerated in stone working technology. "It is, as Isaac says, as if some threshold was passed: a critical threshold in information capacity and precision of expression," (Lewin, 1989, p. 115). Presumably, for any given human population, the crossing of this threshold was caused by a sufficient number of advantageous mutations originating in them, or more likely, reaching them from the populations where the original mutations had occurred.

The major technical development that brought the Acheulian era to an end was the development of the Levallois technique in which a carefully prepared core was first constructed, from which virtually complete flakes could be struck at a single blow, to be followed by a retouching to give the final desired shape. One of the major advantages of this new technique was a greater efficiency in the use of raw materials. An Acheulian tool maker could produce 5.1 to 20.3 centimeters of cutting edge from .45 kilograms of flint, whereas a Mousterian (as the new technology is referred to) tool maker could strike 10.2 meters of cutting edge from the same quantity of flint (Lewin 1980, p. 116). This was a clear improvement that would have been adopted earlier if the humans of the period had possessed the required intelligence.

Unfortunately, the two step procedure of constructing a core and then striking it just as required to produce the desired blades required considerable intelligence. Presumably, when sufficient mutations had accumulated in a population, the newer technique was adopted. Plausibly, individuals of unusual ability might have invented the improved technique earlier, but in the absence of a high enough average ability, the technique might have died with the inventors.

Eventually, the Middle Paleolithic tools were replaced with those of the Upper Paleolithic, which were finer. In Europe, the transition went along with anatomically modern humans replacing the Neandertal, making it very plausible that the modern humans were more intelligent, although the size of the brain case did not increase. (There is some dispute as to how perfectly the replacement of the Neandertals corresponds with the change in the tool kits). Also with the shift from the Middle Paleolithic to the Upper Paleolithic were a number of other changes including the introduction of bone and ivory as raw materials, and the production of elaborate works of arts. These make it very likely that intelligence indeed increased, probably due to replacement of the Neandertals by new arrivals who benefited from more accumulated mutations.

As Mellars (1994, p. 49) recently put it, "there can be no doubt that the whole spectrum of stone tool production in Upper Palaeolithic communities shows a degree of dynamism and creativity which contrast sharply with the much more uniform and conservative patterns of technology documented throughout the long time ranges of the Lower and Middle Palaeolithic periods." He had earlier summarized the evidence (Mellars, 1991) and discussed the possibility that (Mellars, 1989, 357) "the increased complexity apparent in Upper Palaeolithic technology reflects-at least in part-some kind of fundamental change in the basic structure of human thinking or cognition associated (at least broadly) with the transition from archaic to modern human populations." The most obvious explanation of this is that the intelligence of the earlier populations had not yet reached the levels required for the Upper Palaeolithic technology.

Wynn (1985) after examining stone tools, classifies the makers of Oldowan scrapers as using only preoperational thinking in the Piagetian scheme, while the makers of Acheulean artifacts from Isimila as using operational concepts, partially because the later work exhibited a high level of symmetry. However, Wynn did not believe Levallois technique required more intelligence. He states it is a difficult technique to master, but not one that is difficult conceptually. Gowlett (1984) is another author who has emphasized the intellectual abilities of early hominids.

It is hard to imagine that during the long periods when humans used only primitive technologies, that the only thing preventing them from using more sophisticated technologies was that no one had discovered these technologies. It is implausible, for instance, that during very long periods of time (thousands of years) that someone would not have invented fancier methods of knapping stones, or the idea of hafting tools. Given the superiority of these methods, they would have been widely used had the population been intellectually capable of mastering their use.

The conclusion is that the earlier populations were of lower intelligence than current populations. With ongoing selection for intelligence it is likely that intelligence gradually increased. This evolution of intelligence presumably took the form of the occasional appearance of intelligence increasing mutations, and then the gradual diffusion of these mutations. The slow rate of increase of intelligence would be consistent with the rate at which intelligence increasing mutations were occurring limiting the increase in intelligence, rather than any cultural factors, which operate much more rapidly.

There is other evidence for gradual increases in intelligence within relatively recent periods. Whallon (1989) points out that two major demographic events occurred in the earlier part of the Upper Palaeolithic, the expansion of human populations in Australia and Siberia, arguing that the occurrence of these two events after a long period of human presence on earth requires an explanation. He argues these required new socio-cultural structures, but that these structures would have required the development at this time of even more fundamental human capacities

for conceptualization and communication. He associates most of these changes with a greater capacity for more complex language, but a reading of his argument shows that all of the required adaptations could have resulted from a higher level of intelligence, with humans earlier not having the intelligence needed to settle these relatively difficult environments of low resource density and high unpredictability, and then settling them once they had developed the required intellectual abilities to support the cultural and communicative changes required.

To argue that humans very early had high levels of intelligence requires explaining why they did not settle these difficult environments. To argue they had not yet developed necessary cultural traits raises the question of why not. It is far simpler to argue that intelligence had been gradually increasing, and at earlier periods it was inadequate to provide the cultural techniques needed to settle such areas. As Whallon points out, the obstacle could not have been the development of specific cultural forms since the forms required for the Australian desert and for the cold of Siberia are quite different. However, developing the relevant cultural forms (of kinship, past and future tenses in language, the ability to communicate complex concepts, to maintain rule based social organizations required to avoid wasting fights over resources, etc.) could have required high intelligence (not his word, but his words seem to imply intelligence) which had not earlier existed.

One terminological implication of the unidirectional selection should be noted. It is frequently argued that one cannot speak of more advanced or more primitive populations because all populations that have survived to the present are well adapted to their environment, as evidenced by their having survived. However, if all populations are evolving in the same direction, it does make sense to discuss how far populations have progressed in the common direction. For what ever characteristic being discussed, it does indeed make sense to speak of some populations as advanced, and others as primitive.

[Image]

Genetic Mechanisms

At first glance, if all current populations originated from a common population, and each descendant population had experienced similar selective pressures, the descendant populations would have experienced similar shifts in gene frequencies. Thus, we would expect them to have similar intelligences.

One exception to this principle would be the action of chance, what is known in population genetics as drift. If a population is small, the accumulated action of chance can cause the frequency of a single gene in one population to differ considerably from that in another population (see any population genetics text such as Cavalli-Sforza & Bodmer, 1971). If intelligence was determined by a single gene, observed population differences in intelligence could easily be explained by drift. However, if drift was the only factor operating, different

intelligence promoting alleles would be predominant in different populations. One population might have an advantage in having a higher frequency of one intelligence promoting allele, and another population would have an advantage in the frequency of another intelligence promoting allele. Many of the differences in frequency would cancel each other out, leaving relatively small differences between populations in intelligence, even if there were large differences in the frequencies of specific intelligence promoting genes.

If we leave aside the influence of differential natural selection and drift, natural selection with a uniform strength would appear unable to change gene frequencies sufficiently to produce population wide intelligence differences. Yet we do observe such differences. Why? A possible answer is that, if populations do differ in size, they will differ in number of advantageous mutations. This will lead to differences in intelligence.

Incidentally, this same theory could be applied to other issues such as the evolution of disease resistance. The disease organisms in a large population should have evolved more effective mechanisms for overcoming the host's defenses than the organisms in a small population. When the populations come into contact, there will be more diseases spreading from the large population to the small population, than from the small to the large population. This is indeed what was observed when the New and Old World populations were brought into contact. The diseases introduced from Europe and Africa into the Amerindian populations were more numerous and caused more harm than the diseases introduced from the Americas into Europe (of which syphilis appears the chief example).

The fact that more diseases spread from the Old World into the New World, than in the other direction, is consistent with the Old World population having indeed been significantly larger than the New World population during the period when the two populations were separated.

Once such intelligence related genes had appeared in a population and reached a high enough frequency that mere random variation could not eliminate them (even advantageous mutations can disappear through the operation of random factors), natural selection would have caused these genes to increase in frequency and to gradually spread until they had reached all of the populations that were exchanging genes with the populations where the mutations first occurred.

What could happen to stop the spread of intelligence increasing mutations? Obviously, if there was a large barrier to human migration, such as an ocean across which people did not move, the spread of the advantageous alleles would be stopped. Thus, one would expect that certain advantageous mutations would have reached populations on one side of such a barrier, but not on the other side.

Depending on which side of the barrier a particular advantageous mutation emerged, there could be different favorable mutations on each side. For instance, it is quite plausible that certain

mutations originating in the Americas were prevented from reaching Asia by the Pacific Ocean, while other mutations originating in Asia were prevented from reaching the Americas by the Pacific Ocean.

Current thinking is that the variations in intelligence between individuals are related to variations in a large number of genes. While the magnitude of the effects of variation at different genetic loci presumably vary, it is plausible that the individuals who have received the larger number of advantageous mutations have the higher intelligence. Of course, strictly speaking, the individuals with the smallest number of advantageous mutations could have had the mutations that exert the greatest effects, but it is a convenient shorthand to talk merely in terms of the number of advantageous mutations.

Likewise for populations. The population that has received the greatest number of advantageous mutations would normally have the highest average intelligence. This brings us to a natural question. Is there any reason to believe that populations on one side of a barrier will have received more mutations than on the other side? Yes, there is.

Given the same mutation rate on all continents (and there is no reason to believe it differs) the number of favorable mutations (and only a small percentage of mutations are likely to be intelligence increasing) will be proportional to a continent's total population. Admittedly, a mutation may take longer to diffuse through a large continent's population than through a small ones population, but eventually any advantageous mutations should spread throughout the whole population. Thus, we reach the conclusion that more favorable mutations should be found on the side of a barrier with the larger population.

Biraben, (1980, see the table in Cavalli-Sforza, Menozzi, & Piazza, 1994, p. 68) has estimated prehistoric populations. The total world population at 400 B. C. is estimated to be 162 million. Oceania is only 1 million and the Americas 6 million. Since the above estimates were for 400 B. C. when many Old World areas had agriculture, the population differences may be somewhat overstated. However, given the large area of Eurasia, it is plausible that its total population at all times was appreciably larger than that in Australia or the Americas.

As noted earlier, this implies that these two latter areas would have a lot fewer intelligence raising mutations during any particular period. This would in turn imply that over any particular period, such as that since the first settlers reach Australia or the Americas, that any given degree of selective pressure would have produced a greater increase in intelligence in Eurasia than in Australia or the Americas.

[Image]

The Mechanism of the Intelligence Lag in Australia

Let us start the discussion with the case of isolated populations with no gene flow between them. The population's expected average intelligence would vary with the number of relevant mutations that have occurred in it. In turn, the total number of favorable mutations experienced would be proportional to the population size (and to time).

The smaller, more isolated populations would lag in intelligence. Populations for which this effect would be expected to be important include Australia and the Americas. Both have relatively small populations that have been isolated from the rest of the world for most of their history.

Roberts, Jones, & Smith (1990) have reported a date of 50+ years for human related material from North Australia. Although the Australian population was probably intellectually advanced when the continent was settled (they had to be able to build at least bamboo rafts in order to cross the open ocean and settle the Australian/New Guinea continent), after settlement it was probably isolated from mutations originating elsewhere in the Old World. With a population too small to generate as many mutations as the much larger Eurasian population, it would have gradually lagged further and further behind Eurasia in intelligence, even if the selective pressures for intelligence were as strong.

Might there have been a continued arrival of new Eurasian genes? Probably not. The Australians upon European contact lacked ocean going boats. Most likely, the continent was settled by accidental immigrants who were shipwrecked there while attempting voyages along the coast of the Sunda shelf, which is now Indonesia (for a summary history see Jones, 1989, pp. 754-756). The first settlers were unopposed and had a virgin continent to exploit. Thus they were able to settle and to flourish, even if upon arrival they were tired, unorganized, and not knowledgeable about the terrain or food.

However, once the land was settled, newer arrivals would have a much smaller chance of contributing to the Australian gene pool. Like many other hunter-gatherers, the Australians encountered by the first Europeans were suspicious of strangers and hostile to members of other groups not related to them. Their ancestors were probably similar. Thus, after the first group had settled the land, more recent arrivals would have been treated as hostile, and would be expected to have been exterminated by the first arrivals (Jones 1989 argues that more recent arrivals would probably have been killed, although he allows for the possibility of women being incorporated as wives). Upon arrival, probably as a result of a raft being blown off course, the newcomers would have been unorganized, weak, and few in number. This would have made it possible for them to be killed, if those already there had wished to do so.¹ New arrivals would have had the disadvantage of not knowing the terrain, or how to exploit local food sources. Hunting and gathering by the first settlers would have lowered the density of food resources, putting new arrivals at a disadvantage.

Also, as sea levels rose, the distances from Indonesia to Australia grew. This may have

prevented, or even eliminated any further settlement and gene flow.

After the initial Australian/New Guinea settlement, any favorable genes reaching the Indonesian Archipelago would have been unlikely to reach the Australians. The Australians would have gradually fallen behind in intelligence due to their isolation from the rest of the world's population.

The above argument is strongest if once Australia was settled, there were no further arrivals of peoples from Eurasia who could have brought intelligence raising alleles from Eurasia. However, some argue that the prehistoric Australian human skeletal remains differ sufficiently from each other to imply the arrival of more than one wave of migration (Brown, 1993). Variations in morphology and gene frequencies among various Australian populations have been interpreted as evidence of multiple waves of settlement (Cavalli-Sforza et al. 1994, pp. 345-346). In particular, Thorne has identified two morphological types of late Pleistocene Australian crania which he interprets as evidence of two separate migrations to Australia (Thorne 1977 as cited by Habgood, 1989, p. 259). The arrival of the dingo, a semi-domesticated dog, almost certainly a companion of people, at about 4 thousand years ago, shows that at least one other successful incursion occurred (Jones, 1989, p. 756).

Shortly before the first Europeans arrived, there were trepanging visitors to northern Australia from what is now Indonesia (Macknight, 1976), but they were too few and too late to have an appreciable genetic impact.

A somewhat similar theory is provided by Thorne and Wolpoff (1981) to explain the larger facial size and masticatory apparatus in the peripheral regions of Australasia. They hypothesize that technological progress in food preparation first occurred in South China, where genes for reduced masticatory apparatus appeared. These gradually spread to the periphery of the region in Australia. They say that (p. 348) "while some changes might eventually characterize the periphery, by this time further reductions would have occurred at the center." While their argument does not explain why the shrinkage of the masticatory apparatus should proceed more rapidly in the center than in the periphery, their theory does have some resemblance to the theory proposed here. The theory proposed here makes the progress more rapid at the center because its population is larger, and the total number of favorable mutations greater. Incidentally, if intelligence does lead to greater progress in food preparation (such as the discovery of cooking, or of the ability to make pots for boiling), the theory here could explain the larger masticatory apparatus in the Australians.

So far only a theoretical case has been made for why lower intelligence in Australian aboriginals and American Indians should be expected. It is now time to look at the evidence to see if the theory is supported.

[Image]

Australian Aboriginal Intelligence

The evidence is that Australian aborigines are low in intelligence in comparison to other populations (Seagram & Lendon, 1980, and Klich, 1988, provide an introduction to the literature).

McElwain & Kearney (1973, p. 53) summarize the results of a number of intelligence tests. The aborigines do consistently worse, with the disadvantage greatest on those with a high verbal component. On Raven's Progressive Matrices the difference is given as .95 standard units. The Queensland Test results are perhaps the most useful. This is a modification of a test (the PIR test) devised to select troops from the Pacific Islands. Use of this test in Papua and New Guinea reduced the proportion of those unable to master the basic Australian Infantry training from 20% to about 2%. It thus appears to have validity in indicating the ability of a population from a different culture to master European techniques. The material is completely non-verbal in both administration and response and the material is non-representational with no pictures and no object used that has a common use or meaning. The scores are reported to be .99 standard units below that of Europeans (McElwain & Kearney, 1973, p. 53), with the scores varying with the extent of contact with Europeans. "the aboriginal groups are inferior to Europeans, and in approximately the same degree as they have lacked contact with European groups. The Dunwich children give results very close to those for European children, the Palm Island results are lower and the remote areas of the Northern Territory are further depressed" (McElwain & Kearney, 1973, p. 47).

Reference to the test manual (p. 123) shows the Palm Island group to be one where "Traditional tribal life has been absent for many years and only a few old people are familiar with Aboriginal languages. The Aboriginal people have been drawn from tribes from all parts of Queensland and have no common language except English and a form of camp-Pidgin. Very little of the food consumed is derived from native sources or by traditional means." Of the other medium contact group, that at Cherbourg, it was said "Tribal life and language are virtually extinct."

To give a flavor for the results, Figure 1 shows the results for a European group Taringa State Primary School, a Brisbane suburb, a medium contact aboriginal school (Palm Island), and a low contact aboriginal group (Maningrida School in Arnhem Land) whose tribal life was described as almost intact. The age patterns are rather interesting, with there apparently being a ceiling effect for the European children, and the low contact aboriginals shows surprisingly little improvement with age.

Although not graphed, the Dunwich European and aboriginal samples (given for only three age groups) are indeed very similar.

De Lacey (1971, 1972) has reported Peabody Picture Vocabulary test scores for high-contact

aboriginals (urban, not speaking a native dialect) and for low-socio-economic status whites. The 40 Northern Territory aboriginals averaged 64, and the 80 Wollongong low-socio-economic white children averaged 94, a difference well beyond the .01 level of probability. Interestingly, on Piagetian classificatory ability tests the aborigines were in the same range as the low-socioeconomic status whites (i.e., below the white average) (De Lacey, 1970, 1971). De Lacey (1972) also reports Peabody results for Bourke Island part aborigines (63 IQ) and Bourke Island low socio-economic status whites (87 IQ).

Of course, it is hard to know from test results whether the poor performance is due completely to environmental effects, or partially to genetics. The controversy with regard to aborigines appears in form and nature of arguments to be very similar to that in the US about blacks and whites. Space does not permit reviewing the issue here (Jensen, 1980, is the standard early source and Herrnstein & Murray, 1994, give more recent references)

One preliminary issue should be dealt with. Much of the work done with aborigines has involved Piagetian tests, especially of conservation. Those working in the Piagetian tradition (including, I suspect, the authors of the cited studies) do not think of these as intelligence tests. However, the results of these tests do correlate well with traditional intelligence when used with young children, and with performance on tests of academic achievement, including mathematics and reading (see Table 14.1 in Jensen for a long list of the correlation coefficients that have been discovered in various studies). Indeed, as Jensen (1980, pp. 669-676) points out, the individual items of these tests appear to be superior to the individual items on standard intelligence tests. The tests appear to involve less knowledge that is specific to Western cultures than some may think.

Consider the conservation of volume. Seagram & Lendon (1980, Chap. 3) describe in detail their procedures. For instance, for the conservation of quantity the test starts with pouring water from one glass to another of the same size and confirming that the child understands they contain the same quantity. The water from one of these glasses is then poured into a tall, thin glass and the child asked if it still contains the same amount as before, with the practical implications made obvious by offering to give the child one of the glasses. Interesting, young children will normally believe there is more water in the taller glass than in a shorter glass, even though the water had just been poured from an identical glass into the taller one. As children mature they come to understand that the quantity of water is conserved when it is poured from one glass to another. The child is then considered to have acquired the concept of conservation. Questions are used to establish whether the child understands the concept of conservation of volume, and the idea of reversibility. In general, more intelligent children make the transition at an earlier age.

A similar test for conservation of weight used identical balls of plasticine. Two identical balls were shown to have the same effect on simple balance, and the child was questioned to be sure he understood the role of weight. "The child was then asked to deform one of the balls of

plasticine and to make judgements about the consequences of placing it and its equal partner on the pans of the balance." The child would then be questioned to see if he really understood that weight was unchanged when he deformed the ball of plasticine.

Tests of this type can be given to children not exposed to Western cultures since they will have had experience with such simple tasks such as pouring liquids from one container to another. Indeed, it could be argued that in the dry Australian desert a knowledge of the idea of conservation would be more important than in Western civilization, where water conservation is unimportant. Certainly, the child who can be deceived about whether he was getting as big a drink as another by simply giving him less, but in a taller container would be at a disadvantage.

In the US, differences between whites and blacks have been found using Piagetian tests that are similar to those found using traditional intelligence tests. Interestingly, US aboriginals score well above blacks and close to very low socio-economic status whites, although they are culturally further (many being bilingual) from the white majority than the blacks (Gaudia, 1972). While the charge is frequently made that Westerners always do better on tests designed by Westerners, this is not true for the Piagetian tests, and Arctic Eskimos have been found to do better than white Canadian children (McArthur, 1968, p. 48) on many Piagetian tests, including one of volume conservation (such as employed with Australian aborigines), and Canadian Indians do almost as well as Eskimos (Jensen, 1980 citing Vernon, 1965, and McArthur, 1968).

A sample of adopted and fostered aboriginals (typically of mixed European and aboriginal ancestry) children in Adelaide that had been reared in the homes of Australians showed performance on tests of conservation of quantity and conservation of weight that was significantly poorer than the norms for Europeans, although on other tests, including serration, the Nixon test, and the Peabody Picture Vocabulary test, the performance approximated European norms (Dasen, de Lacey, & Seagram, 1973). The majority of the children were also reported to be below average in school work, and most were reported to experience particular difficulty with math. Since being raised in a European background controlled for differences in the environment, that aboriginal performance was below European norms is strong evidence for a genetic difference.

The general performance of aboriginal children in school is poor. Seagram, & Lendon (1980, p.7) describing it as follows, "The realities are that the Aboriginal children of Australia are obliged to undergo a form of Westernized schooling which is rarely modified to suit their particular needs. This involves most of them in daily attendance at school for about eight years but leaves them mainly illiterate and innumerate. The imposition of this regime is seen by its purveyors to be in the best interests of the Aborigines and is not obviously resented by the children's parents who, on the contrary, ask only that it be more successful." If the phrase "mainly illiterate and innumerate" is accurate (and the writers are clearly very sympathetic to the aborigines and reluctant to impugn their abilities), it would seem hard to argue that the aborigines are of an intelligence similar to that of many other groups. For instance, in the United

States, Amerindians after eight years of schooling would not be described as "mainly illiterate and innumerate", although they clearly perform below white norms. The evidence is that the aborigines do poorly in school and are disproportionately in slow learner classes (Callan, 1986, p. 42).

Additional evidence is supplied by studies of aborigines in the Northern Territory (de Lemos, 1967, 1969a). On Piagetian tests of conservation the aboriginal children did appreciably worse than Swiss children did on the same tests. There was a statistically significant tendency for the part-European children (even though typically only one eighth European) to do better on tests of conservation, even though both were in the same culture. This was significant at the 1% level for the tests on quantity and weight, and significant at the 5% level for the tests on area and length (de Lemos, 1967). The non-aboriginal genes had been left by various temporary male residents of the community several generations ago, and children of different ancestries were treated the same in the community. De Lemos (1967, 1969b) reports an experiment with conservation in which adult aboriginal subjects were offered a choice between two glasses of sugar. One long and thin glass had been filled with one cup of sugar in front of the subjects, and the other, a wider and shorter glass, had been filled with one and a half cups of sugar, again in front of the subject. "Eight out of twelve Aboriginal women took the sugar from the long glass; that is the glass which had less sugar." (De Lemos, 1967, p. 7.). Incidentally, this illustrates the type of discriminations that are tested in a test of conservation (here of quantity).

De Lemos (1967) notes in reference to conservation that "According to Piaget's theory this concept is basic to all logical thinking, and this retardation would therefore indicate that intellectual development proceeds much more slowly in the Aboriginal culture, and that in general Aborigines would achieve a lower level of intellectual functioning than in normally achieved in the European-culture." She goes on to say "However the significant differences found between the part-Aboriginal and the full-Aboriginal children tested at Hermannsburg suggest that they may be racial differences in intelligence which could have contributed to this retardation. Vetta (1972) has critiqued her methodology.

However, Dasen (1972) was unable to reproduce in the same population the de Lemos results for better performance in the partly white aboriginals (and again found poor performance), leaving the situation unclear. An examination of the Dasen (1973) results shows that the part-aboriginal children generally did do better than the full aboriginal children (except on conservation of length tests) although the differences were not statistically significant. It is not known whether the difference between the two studies is statistically significant, or if it might better be attributed to sampling variability. Taking the two samples together, some support for a genetic difference can be deduced.

Of course, aboriginals need not do poorly on all tests. Kearins (1981, 1986) reports on experiments measuring memory for spatial location of objects. She found that aboriginals did better than whites. Since this was true of aboriginal who were at least a couple of generations

removed from their original lifestyles, while these did not differ much from those who were less acculturated, it appears likely that there is a genetic difference here. Kearins argued that this spatial ability was very useful for pathfinding in the desert. However, Drinkwater (1976) did not find such an advantage for a sample of non-desert aboriginals, although Kearins pointed out that even performing at the white level was impressive, since the aboriginals in general did not do this well.

Additional evidence of aboriginal superiority at spatial relations is supplied by Kearins (1988). She found that when day care children (4 to 4.5 years of age) were asked to indicate by pointing the direction to their home, 58% of the aboriginal children were correct while none of the university day care center children could do this and only 5% of those in an urban blue collar center, while the aboriginal children were significantly worse at knowing their addresses, ages, or at counting than were the white children. The aboriginal children were also significantly better at the kindergarten game of fishing (catching artificial fish) which required speed and manual dexterity.

A possible explanation for the aboriginal advantage in spatial memory is provided by (Klekamp et al., 1994) who report that Australian aboriginals have a larger visual cortex than Caucasians.

The brains of Australian aborigines also show a prominent lunate sulcus at a higher rate than in other races (Baker, 1974, p. 293), which Baker notes indicates that "the visual area does not extend nearly so far round the posterior end of the occipital lobe on to its lateral surface" in Europids as in Australids. This is a feature considered by some to be relatively primitive. Also the percentage of skulls with fronto-temporal pterion on one or both sides is much higher in Australids (and Negrids) than in Europids of Europe (Baker 1974, p. 299). It is not known what the implications, if any, of these morphological differences are for brain function. However, the tendency that some observers see for the Australian aborigines to retain many primitive features is very consistent with their isolation having prevented the genes for many traits from having reached them.

A possible biological basis for low intelligence in Australian aborigines is provided by their relatively small brain sizes, which is reported to be about 85% of that for the normal European (Baker, 1974, p. 292), with some of the smallest brains reported in normal people being found among them (Coon, 1962, p. 411). The most recent work (Klekamp et al., 1987) confirmed earlier work by finding a statistically significant difference in fresh brain weight with aboriginal brains averaging 1241 grams, versus 1421 for Caucasians. Harper & Mina (1981) reported statistically significant ($p < .001$) brain weight differences (from the same set of brains) in paired samples matched for age and height. Brain size (as measured by either head size or magnetic resonance imaging) is known to be correlated with intelligence (see the list of studies in Lynn 1991b; Miller, 1994; Rushton, 1994, 1995; Rushton & Osborne, 1995, and Rushton & Ankney, in press).

The isolation of the now extinct Tasmanians should have isolated them from late occurring mutations on the Australian mainland. Although no mental tests data is available on the Tasmanians, their culture is usually considered among the most primitive known. Apparently, they are the only people known that could not make fire, but had to get it from another band if theirs went out. Likewise, their stone tools were unhafted (Ryan, 1982).

Of course, in documenting the low intelligence of Australian aboriginals the purpose is not to encourage arbitrary discrimination against them. There is enough variability in humans that decisions should not be based only on group membership. However, elementary application of Bayes' theorem does show group membership to be relevant where the group averages differ (Miller, 1994).

[Image]

American Aboriginal Intelligence

A similar story would apply to the American natives. They test worse than Caucasians and Mongoloids (Lynn, 1991a, Table 5) even though they are considered to be Mongoloids, a group that generally tests well (Lynn, 1987). Space here does not permit reviewing the extensive literature on the intelligence of American natives (fortunately much of it is reviewed in McShane & Berry, 1988).

The best single source of evidence on American Indian intelligence is provided by the Coleman report. This sampled large numbers of children widely across the US and picked up non-reservation Indians who would be functioning in the main stream US society. Jensen (1980, p. 479) calculated the Indian/white differences as .67, .93, .79, and .93 standard deviation units at grade 3, 6, 9, and 12 for verbal IQ and .38, .83, .54, and .57 for vonverbal IQ. These were appreciably smaller than observed for blacks (in spite of their higher socio-economic condition and greater acculturation). The smaller deficit on the nonverbal tests is a widely reported result, which probably reflects a true difference in the pattern of abilities.

The Americas are believed to have been settled by a relatively small population passing over the Bering Land Bridge from Asia. They probably brought only some of the alleles for high intelligence with them from Asia. The subsequent sea level rise cut them off from the mutations arising in Eurasia. Since the Americas had a lower population than Eurasia (implying a smaller number of favorable mutations), they gradually came to lag behind the Eurasian populations in intelligence.

The parts of Siberia that the Amerindian ancestors came from is at the continent's periphery, far from the more densely populated areas. Thus, it is possible that advantageous alleles that had originated elsewhere in Eurasia had not yet reached the populations at the time that they crossed the land bridge, and that the alleles had not reached them when the Americas were isolated by

the bridge's submersion.

[Image]

Testable Implications

What other predictions emerge from the theory that mutations favorable to intelligence have not reached certain populations? Right now, while the evidence is quite strong that there are genes that contribute to intelligence and other forms of behavior, exactly what these genes are and where they are located is unknown.

Evidence has recently been presented that several genetic markers are statistically more common in those of high intelligence than in those of low intelligence (Plomin et al., 1994; Plomin et al., 1995). Recently the first case of an allele that differs in frequency between racial groups and affects a mental ability has been reported (Berman & Noble, 1995). Given the rate of progress in molecular genetics, it is likely that several more alleles that have a positive or negative effect on intelligence will soon be located.

Recently, alcohol consumption by Orientals in North America was shown to be largely predicted by a single gene (Tu & Israel, 1995), with differing prevalence of the gene able to explain much of the racial differences in drinking. The above theory predicts similar patterns for intelligence affecting genes.

If the above theory is right, not only will these genes prove to differ in frequency between populations in different areas of the world, but some of the ones identified in European or northeast Asian populations (the populations most commonly studied, simply because they are convenient to the leading laboratories) will be found to be essentially absent (a low frequency may be the result of recent mixing with Europeans) in the original aboriginal populations in such areas as Australia and the Americas.

The above theory raises the possibility that certain alleles with a favorable effect on intelligence may have become fixed in European or Northeast Asian populations if they originated in these regions, (and possibly even if they originated elsewhere but reached these populations early enough for natural selection to fix them). Studies that are limited to just one group (such as Caucasians or Japanese) may not detect a correlation of these genes with intelligence. The above argument would suggest that mixed populations (such as those of mixed Australian Aboriginal and Caucasian descent) might very profitably be investigated. A finding that possession of a particular genetic marker correlated with intelligence would suggest that the marker either directly affected intelligence, or was close to a gene that affected intelligence.

Of course, in populations that are a mixture of two populations that differ in intelligence, any gene that differs in frequency may be merely serving as a marker for the extent of admixture (or

for the extent of acculturation). It would be necessary to control for this. A good technique is to study siblings of mixed parentage to discover if a sibling who inherited the allele believed to raise intelligence also exhibited higher intelligence. An implication of the theory of this paper is that sibling studies (ideally of dizygotic twins) where one parent was aboriginal (either Australian or American) and one was European or Asian (i.e. what in animal genetics is called a F1 cross) would be a very good strategy for identifying alleles that affected intelligence. By having the offspring raised in the same family, the risk that a particular allele was merely serving as a marker for the extent of admixture or for acculturation would be reduced.

Many genetic markers, including blood group, human leukocyte antigen genes, and restriction length polymorphisms, are known to differ between populations (Cavalli-Sforza et al. 1994). It should be possible to estimate the extent of admixture independently of the genes believed to have a link with intelligence. Independent measures of acculturation would have to be sought as a control. This differs from the procedure of the major quantitative tract loci studies of intelligence so far (Plomin, et al. 1994; Plomin, et al. 1995), which limited itself only to Caucasians.

It was argued that some isolated areas such as Australia may have received few new mutations after settlement. However, if they experienced continued selection for intelligence, some of the alleles that the population arrived with may have become fixed, or nearly fixed in their populations. In this case, the standard deviation of intelligence should be smaller in such populations than in the populations that have been continually receiving new genes from other populations. This is a testable prediction.

Africans are generally found to have somewhat lower standard deviations than Caucasians (Jensen, 1980). This might be explained by a slower migration of alleles into Africa. Many intelligence relevant alleles would have reached them so long ago that they had become fixed, and many other alleles would not have reached them yet, even if they accounted for appreciable variation in other populations. In the areas that have had continual access to new mutations there will be more alleles that have not become fixed, causing a greater standard deviation of intelligence.

Incidentally, this ongoing process of new mutations coming into a population followed by selection for them may be the way to resolve the paradox of why there is so much genetic variation for intelligence (g), if g is a beneficial trait.

If intelligence is subject to unidirectional selection in which people with a higher intelligence always benefit reproductively from being able to outwit those of lower intelligence, it is likely that any given time there will be some of higher intelligence than others, thus solving the problem.

As intelligence gradually increases, it is to be expected that a few individuals with sufficient

intelligence to do psychometrics and discover the concept of g will emerge. At this time, only a small fraction of the population is likely to have sufficient intelligence to do psychometrics and to understand the concept of g. Thus, the finding of a wide range in intelligence is perhaps not as surprising as it might appear at first.

Likewise, with there being several continent sized populations of different sizes, it is to be expected that the larger ones will benefit from access to a larger number of mutations, and will pull ahead in intelligence. Thus the theory predicts that the populations of continents of different size will differ in intelligence. It is to be expected that the major innovations will occur first among the more intelligent population on the most populous continents (assuming equal selection pressure for intelligence). Thus, it is not surprising that seagoing ships and the navigation skills required to cross oceans to visit other continents first emerged in Eurasia. These innovations brought more advanced populations into contact with the populations on the less populated continents. The more advanced populations had developed more advanced technology and established control of the Americas and Australia. The superior intelligence of the Eurasian populations (primarily from Europe) led to them having a higher level of education and higher incomes than the aboriginal populations of Australia or the Americas (for documentation of the role of intelligence in affecting income see Herrnstein & Murray, 1994)

[Image]

The Role of Isolation in Evolutionary Advance

The argument that isolated populations, lacking access to mutations originating on other continents, may lack certain intelligence promoting alleles, may surprise those who remember that biologists have argued that evolution is faster in small isolated populations (Mayr, 1966). Am I arguing against this generally accepted proposition? No. The two propositions are really different.

The belief that evolution occurs faster in small isolated populations can be traced to several effects. One is that deleterious recessive mutations may be eliminated more rapidly in such populations since the carriers are more likely to mate.

Another is that gene flow from outside of the population may prevent the evolution of gene combination best adapted to a particular environment, especially one on the fringes of the range of an environment. With isolation, the gene flow stops and such new combinations can emerge.

More importantly, innovations that require two or more mutations to succeed may occur more easily in small populations. Suppose that one gene could occur in forms Aa and another in Bb where AB represents a superior combination to ab, aB, and to Ab. However, ab is fitter than aB and Ab. This could happen if A and B work well together, and a and b work well together, but aB and Ab are not as successful combinations. Suppose the population starts out with all

individuals being ab . If mutations occur causing A or B appear, these genes would be expected to die out since they would be appearing in the heterozygous forms of Ab or aB , which have lower reproductive success. Even if simultaneous mutations occurred which created AB , it would have only ab 's to mate with, and its offspring would be Ab or aB , both of which would be at a disadvantage. Thus, a large population of ab is evolutionary stable against invasion by a or b .

Now consider a small isolated population, possibly on an island. The B allele could emerge, and by the operation of drift come to be the common allele, and possible to be even fixed. In a population that was predominantly aB , the A allele can then invade. Since AB is fitter than aB , once the A allele appears at an appreciable frequency, it can be expected to spread. Thus, the small isolated population can come to have the genotype of AB , which is fitter than ab . If the populations then become combined (perhaps by the island reuniting with the mainland), the AB variety may be able to spread at the expense of the ab . Such a spread is especially plausible if there has emerged a mechanism that keep AB from mating with those of the ab type.

The argument can easily be extended to where three mutations or more are required to produce a new variety or a new species. It is argued such combinations can most easily occur in small, isolated populations. This especially applicable to the emergence of new species where multiple mutations may be required which work well as a group, but any one of which is deleterious alone.

In contrast, this paper deals with simple mutations which increase the intelligence, and hence the fitness of the organism. These mutations are capable of invading a population and then diffusing through it. For these types of alleles, the key question is how many such mutations have reached a population.

[Image]

Conclusions

There has been continuous worldwide selection for intelligence, although its strength may have varied with climate. Intelligence gradually increased, as reflected in the sophistication of the human tool kits. This increase was caused by intelligence increasing mutations, followed by the spread of these mutations. These mutations occurred at approximately the same rate (per million population) on different continents, but in absolute number were most common in the Eurasian land mass with its high population.

When Australia and the Americas were settled the original populations lacked certain alleles because the relevant mutations had not yet occurred, or because these mutations had not reached the relevant parts of Eurasia. After Australia and the Americas came to be isolated from the larger Eurasian populations, they did not receive further immigrants. Although a few

intelligence raising mutations occurred in their populations, the smaller Australian and American populations implied that the total number of beneficial mutations was less than in Eurasia. Thus, the intelligence of the Australian and American populations came to lag behind that of the rest of the world. Of course, other factors, such as weaker selection for intelligence in certain parts of the world (such as the tropics) may have played a role.

This lower intelligence, along with other effects of isolation due to lack of disease resistance, and lack of access to cultural innovation, placed these populations at a disadvantage when they did come into contact with seafaring populations from Eurasia (Europeans) and led to European conquest of these populations. After the conquests, the lower intelligence result in the native populations having trouble competed and having an on average lower income than those of Eurasian descent in all of these countries.

[Image]

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[Image]

Footnote

¹This might not have applied to arrivals closely following the original arrivals, but such immigrants would be unlikely to be carrying alleles that the original settlers lacked.

Invisible Men

Review of: Paved With Good Intentions: The Failure of Race Relations in Contemporary America, by Jared Taylor (Carroll & Graf, 416 pp., \$22.95)

By PETER BRIMELOW Mr. Brimelow is a senior editor at Forbes.

from National Review magazine, January, 18 1993

"WAS THE MUGGER black?" asked my wife sympathetically. As a Canadian newly arrived in Manhattan, she honestly didn't know that you must never ask. Her hostess, caught off balance in mid crime story, admitted that he was. Then she hurriedly covered herself: of course, she said, this meant nothing. Besides being a Canadian, however, my wife was and still is in some respects invincibly innocent. And now she was really puzzled. "But aren't most muggers in New York black?" she inquired. Her hostess was outraged. "I don't believe that," she snapped.

The single greatest strength of Jared Taylor's Paved with Good Intentions is its massive and merciless crushing of this type of hysterical denial, which currently paralyzes all discussion of race relations in America. Considered entirely by itself, this achievement makes his book the most important to be published on the subject for many years. In this area, experience shows that it is not enough to be mugged by reality. Footnotes are apparently necessary as well. And Taylor provides 1,339 of them, quarried from a remarkably wide reading of contemporary sources.

Thus it is indeed true that blacks commit most of New York's violent crime. Even a decade before my wife arrived in Manhattan, by the early 1970s, blacks already made up over 60 per cent of those arrested for violent crime, but only 20 per cent of the city's population. And more recently, for example, black men have been responsible for over 85 per cent of the felonies committed against New York City cabbies, as many as 17 of whom are murdered each year.

Nationwide, blacks -- although only 12 per cent of the population -- account for 64 per cent of all violent-crime arrests and 71 per cent of all robbery arrests.

But isn't this because the police are racist?

Apparently not. Taylor hunts down and extirpates all such infinitely regressing excuses, which have for too long substituted for thought in American political discourse. In this case, for example, he proves via a closely reasoned analysis, based on witness reports and arrest patterns for burglaries, traffic violations, and drunkenness, that policemen of all races are, if anything, more lenient with criminals of a different race from themselves. (Which, of course, is just what you would expect, given current political pressures.)

Nor is the disparity caused by middle-class law enforcers over-concentrating on street crime. In 1990, blacks were nearly three times as likely as whites to be arrested for white-collar crimes such as forgery, counterfeiting, and embezzlement. And, finally and conclusively, blacks

themselves are responsible for 73 per cent of all justified, self-defense killings.

The vast majority of the people they kill are other blacks.

A fascinating Orwellian double-think enabled my wife's hostess to evade this reality -- although in her conduct she certainly took account of it every day on Manhattan's streets. But this double-think is no mere harmless self-delusion. As in 1984, it requires the constant support of an extraordinary censorship and self-censorship.

Media bias is a subject that easily becomes boring to sophisticates. But the inversions of truth here documented by Taylor are so extreme as to be pathological. Thus he is able to show that every one of the recent alleged

white-racist atrocities -- Howard Beach, Bensonhurst, Rodney King -- had black-on-white analogies that went virtually unreported, although often far worse.

For example, Taylor tracks several years of self-feeding press references to the heinous scandal of a white Stanford student hanging a caricatured blackface Beethoven on the door of a black student (who, as it happens, had insisted Beethoven was black). An entire "campus racism" industry has been called into existence on the

strength of such trivia. But who has heard of the four black University of Arizona football players, three of them on scholarships, whose hobby of beating up lone campus whites landed them in jail in 1989?

Or for that matter of the Miami-based Yahweh cult, whose leader was convicted in 1992 for causing his followers to kill numerous "white devils" -- without benefit of even a fraction of the network prime time devoted to endless reruns of the (dishonestly edited) King-beating video. This powerful combination of internal and external compulsion is literally able to turn black into white. Thus in 1987 Tawana Brawley, the black teenager who claimed she had been abducted by a white gang, was able, despite the increasing absurdity of her attorneys' allegations, to focus the attention of the entire country on the supposedly grave issue of white-on-black rape. But in fact it was a complete chimera. In 1988, there were fewer than ten cases of white-on-black rape -- as opposed to 9,405 cases of black-on-white rape. Taylor reports that black men appear three to four times more likely to commit rape than whites, and more than sixty times more likely to rape a white than a white is likely to rape a black.

Taylor's storm of statistics puts in perspective the view that blacks themselves are the chief victims of black crime. That claim is almost true. In America, blacks account for just under half of murder victims. Any decent person will feel a particular sympathy for respectable black people who are likely to suffer the effects both of black crime and of white suspicion prompted by black crime. But their plight is merely one consequence -- though a harsh one -- of the crisis of black society.

Homicide is now the leading cause of death for black men between 15 and 44; one in four black men in their twenties is either in jail, on probation, or on parole. Syphilis is fifty times more prevalent among blacks than among whites; black children are twice as likely as whites to die in their first year.

And this black crisis still disproportionately hurts whites. Black criminals choose white victims in more than half of their violent crime; the average black criminal seems over 12 times more likely to kill a white than vice versa.

The second major contribution of Taylor's book is its frontal assault on the universal assumption that "white racism" is to blame for everything. In effect, he proposes a logical-positivist's test: since this racism is (as he demonstrates) publicly illegal, privately undetectable in opinion polls, and does not seem materially to affect the economic status of blacks once that status is adjusted for education and other variables, in what sense does it exist?

Taylor documents in immense detail that the U.S., far from suppressing its blacks and poor, in fact subsidizes them, publicly and privately, including more than \$2.5 trillion in federal moneys alone since the 1960s. This, notoriously, has done little good and much ill. But it is hardly the behavior of a racist society -- unless liberal politicians, welfare bureaucrats, and academics have deliberately sought to destroy black society by spreading dependency and pauperism.

The truth may set us free. But it can also make us sick. Many people will unquestionably find Taylor's ruthless exposition of black failure more than they can stomach. One such is the Institute for Justice's Clint Bolick, who has written very sensibly about civil rights, but who recently reproached Taylor in the Wall Street Journal for dismissing "the continuing impact of racism, which most blacks face every day of their lives."

Grant that blacks suffer occasional slights, crude name-calling, and some discrimination. But how damaging are these compared to the self-inflicted wounds of black America? And what prompts this white behavior? Is endemic white racism any more reasonable an explanation for the situation than endemic black criminality and the defensive nervous hostility it produces among whites?

"Race is the great American dilemma," Taylor writes, echoing Gunnar Myrdal's famous survey, *An American Dilemma*. Nearly fifty years later, Myrdal's panacea of integration, equality, and confident social engineering has been followed by disaster. This news could not be more unwelcome. It is hardly surprising that both Left and (alleged) Right prefer to cling to the myth of a culpable -- but therefore at least in theory correctable -- white racist America.

Neo-Lynsekoism, IQ, and the Press

There are two main sections to this page. The bulk of it consists of a critical review by Bernard D. Davis of Stephen Jay Gould's *The Mismeasure of Man*. That is followed by a "Random Sample" by Constance Holden from the AAAS journal *Science*, 18 February 1994, about Bernard Davis. A fact not mentioned in Holden's article is that Davis was author of a book called *Storm Over Biology: Essays on Science, Sentiment and Public Policy* (1986, Buffalo: Prometheus).

Davis, Bernard D. (1983). Neo-Lysenkoism, IQ, and the press. *The Public Interest*, 74, 41-59.

At the time the following paper was published, Bernard D. Davis was Adele Lehman Professor of Bacterial Physiology at Harvard Medical School, where he formerly headed the Center for Human Genetics.

Neo-Lysenkoism, IQ, and the press

BERNARD D. DAVIS

Stephen Jay Gould, a professor of geology at Harvard, has become one of the best known American scientists. His many essays on natural history are entertaining and highly readable, and his attack on the "establishment" version of Darwinian evolution has received so much attention that his picture appeared on the cover of *Newsweek*. He personalizes his expository writing in a breezy, self-deprecating manner, and he comes across as warm-hearted, socially concerned, and commendably on the side of the underdog. Hence he is able to present scientific material effectively to a popular audience--a valuable contribution, and a public service, as long as his scientific message is sound.

It is therefore not surprising that Gould's history of the efforts to measure human intelligence, *The Mismeasure of Man*, received many glowing reviews in the popular and literary press, and even a National Book Critics Circle award.¹ Yet the reviews that have appeared in scientific journals, focusing on content rather than on style or on political appeal, have been highly critical of both the book's version of history and its scientific arguments. The paradox is striking. If a scholar wrote a tendentious history of medicine that began with phlebotomy and purges, moved on to the Tuskegee experiment on syphilitic Negroes, and ended with the thalidomide disaster, he would convince few people that medicine is all bad, and he would ruin his reputation. So we must ask: Why did Gould write a book that fits this model all too closely?

Why were most reviewers so uncritical? And how can nonscientific journals improve their reviews of books on scientific aspects of controversial political issues?

Reviews in the popular press

Typical of the literary reviews of Gould's book is the one that appeared in the New York Times Book Review. June Goodfield, a historian and popular writer on science, is effusive: In his "most significant book yet, Mr. Gould grasps the supporting pillars of the temple in a lethal grip of historical scholarship and analysis--and brings the whole edifice of biological determinism crashing down." *The Mismeasure of Man*, she writes, also shows that, while science can never be wholly objective, "this gloriously human enterprise does provide us both with a method for challenging the status quo and for revealing true knowledge about the world." Moreover, Gould "affirms that most things are humanly possible, and that attempts to confine human beings to limited categories are both downright wicked and bound to be self-defeating."

In the *New Yorker* the book was reviewed by Jeremy Bernstein, a philosophically-inclined physicist. His analyses of scientific books have in general been excellent, and we might have expected him to be critical of Gould's methodology. But in fact, because Bernstein saw the book as a powerful salvo against racism, he misread it, imputing to Gould his own, different views on intelligence. Bernstein's answer to racism is to emphasize "how numerous the genetically expressed variations are within any social group," whereas Gould in fact insists that in the area of behavior, genetic differences should be ignored. Missing this fundamental disagreement, Bernstein uncritically accepts Gould's indictment of intelligence tests: "because of the false reification of intelligence hundreds of thousands--perhaps millions--of people's lives have been circumscribed or even ruined."

The most perplexing review is Richard Lewontin's in the *New York Review of Books*. Lewontin represents a biased choice on the part of that journal, since he and Gould had taught a course together at Harvard on the dangers of applying biology to society, and he has called for the development of a true "socialist science" to challenge the "bourgeois science" of most Western culture. Yet he turns out to be an interesting choice, for his article is, as usual, brilliant, erudite, and idiosyncratic.

Lewontin agrees that political views, whether good or bad, will inevitably influence the conclusions of scientists, but he chides Gould for ignoring Marxist principles and overemphasizing racism: "*The Mismeasure of Man* remains a curiously unpolitical and unphilosophical book." The emphasis "on racism and ethnocentrism in the study of abilities is an American bias." Further, "In America, race, ethnicity, and class are so confounded, and the reality of social class so firmly denied, that it is easy to lose sight of the general setting of class conflict out of which biological determinism arose." He concludes with a profoundly pessimistic bit of metaphysics: "The reification of intelligence ... is an error that is deeply built into the atomistic system of Cartesian explanation that characterizes all of our national science."

It is not easy, given the analytic mode of science, to replace the clockwork mind with something less silly." But "the wholesale rejection of analysis in favor of an obscurantist holism has been worse. Imprisoned by our Cartesianism, we do not know how to think about thinking." It is unfortunate that this truly gifted scientist trapped himself in evolutionary genetics, a field so at odds with his social convictions.

The popular press has thought the issues to be more clear-cut. Newsweek refers to "this splendid new case study of biased science and its social abuse." The Saturday Review speaks of "a rare book--at once of great importance and wonderful to read." The Atlantic Monthly says, "The tale would be funny if one could overlook the misery that such tests have inflicted on generations of defenseless school children." The Key Reporter (of Phi Beta Kappa) calls the book "a strident, polemical, effective critique."

The scientific reviews

While the nonscientific reviews of *The Mismeasure of Man* were almost uniformly laudatory, the reviews in the scientific journals were almost all highly critical. In *Science*, a widely read American publication that covers all the sciences, the book was reviewed by Franz Samelson, a psychologist at Kansas State University. He concludes that as a history of science the book has a number of problems. For example, he notes, Gould claims that Army intelligence tests led to the Immigration Restriction Act of 1925; in fact, no psychologist testified before Congress, and the three reports of the House Committee on Immigration do not mention intelligence tests at all. On another point, Gould's discussion of the "fallacy of reification"--the grouping of different abilities, such as verbal reasoning and spatial reasoning, into one measure of intelligence--"remains blurred, since Gould's emphasis seems to shift about. Exactly what does he object to? [Gould] never tells us directly what his own proper, unreified conception of intelligence is." Finally, Gould fails to acknowledge that ability testing is "a sizable industry in the real world and a smaller one in academia." And all Gould's incisive thrusts at finagling and fallacies seem to be almost irrelevant. ... Whatever intellectual victories over the [mostly dead] testers Gould's eminently readable book achieves ... the real action seems to be elsewhere."

In *Nature*, a distinguished British journal of general science, Steve Blinkhom, writing from the Neuropsychology Laboratory at Stanford University, is blunt: "With a glittering prose style and as honestly held a set of prejudices as you could hope to meet in a day's crusading, S.J. Gould presents his attempt at identifying the fatal flaw in the theory and measurement of intelligence. Of course everyone knows there must be a fatal flaw, but so far reports of its discovery have been consistently premature." More specifically, "the substantive discussion of the theory of intelligence stops at the stage it was in more than a quarter of a century ago." Gould "has nothing to say which is both accurate and at issue when it comes to substantive or methodological points." Finally, many of his assertions "have the routine flavor of Radio Moscow news broadcasts when there really is no crisis to shout about. You have to admire the skill in presentation, but what a waste of talent."

Science 82, a journal designed for the general public, chose as its reviewer Candace Pert, a biochemist at the National Institute of Mental Health, who has been researching the application of molecular biology and cell biology to the study of the brain. "Gould's history of pseudoscientific racism in measuring human intelligence," she writes, "does not, despite his claims, negate the sociobiological notion that differences in human genetic composition can produce differences in brain proteins, resulting in differences in behavior and personality." In her view, "if modern neuroscience reveals biochemical differences that account for human variability, we must deal with this important knowledge; ... ignoring differences because they could become abuses will not make them go away."

The most extensive scientific analysis of Gould's book appeared in *Contemporary Education Review*. Arthur R. Jensen, of the Institute for Human Learning at the University of California, Berkeley, analyzes Gould's technical arguments in great detail and reaches sharply critical conclusions. He also discusses recent research demonstrating a high correlation of IQ with speed of information processing, as measured by simple reaction-time techniques. These findings encourage a hope that a merger with neurobiology may soon make studies of intelligence much more penetrating and less controversial.

The review that appeared in *Scientific American* is an exception to the harsh criticism in the scientific press. Ordinarily *Scientific American* presents solid science in an interesting way to a very broad audience, and it has been restrained and non-partisan in treating most controversial issues of science. However, there is one exception: The publisher, Gerard Piel, and the book editor, Philip Morrison, have long seen the study of the genetics of intelligence as a threat to racial justice. According to Morrison, as "a persuasive chronicle of prejudice in science, founded on scrupulous examination of the record, enlivened by the talent of a gifted writer, this volume takes on some of the sinister appeal of a tale of heinous crime."

Gould's selective history

It is important for the general public to understand why scientists close to the field have reacted so negatively to *The Mismeasure of Man*. The strength of science in analyzing reality comes from its strict separation of facts from values, of observations from expectations. Measurements of intelligence, and of its hereditary and environmental origins, are part of natural science--even though one must go beyond science, bringing in judgments of value, in order to probe the social implications of the results. Hence any purported scientific exposition of these topics must be as dispassionate and objective as possible about the facts, whatever the social views the author favors. These are precious standards, whose corruption we must resist. Unfortunately, throughout Gould's book they are not met.

The early chapters describe in detail some extremely naive nineteenth-century attempts to measure intelligence in terms of brain size or body shape. These are fossils from the history of

mental testing, and their excavation would ordinarily bore most readers. Gould, however, uses them skillfully, both to give the impression of a thorough scholarly analysis and to arouse indignation at such evil uses of science. Unfortunately, the advocacy and the emotional appeal betray the scholarship. In the early stages of any science, naive ideas, often reflecting the prejudice of the time, are inevitable. Gould infers that this legacy will persist; but history demonstrates that the advance of science depends on continually discarding false hypotheses and preconceptions. Gould further arouses the reader's indignation by describing the ill-informed and prejudiced views of Paul Broca and Louis Agassiz on racial differences. But at a time when slavery was legal, and long before the science of genetics revolutionized our understanding of the nature of race, it is hardly surprising that these views were held by leading scientists--and even, as Gould notes, by such enlightened social critics as Benjamin Franklin and Thomas Jefferson. To remind us of these roots in the history of racism is instructive--but to imply a similar prejudice in today's investigators of intelligence is unfair.

After emphasizing that Alfred Binet developed the first intelligence test, in France in 1905, only in order to improve the education of backward children, Gould goes on to describe misuses of the subsequent tests. His most horrifying example is a primitive study conducted in 1912, in which H.H. Goddard administered intelligence tests to a number of Ellis Island immigrants. He set his standards at an absurdly high level, classifying in the end an extraordinarily large percentage of subjects as "feeble-minded"--a term that then included "morons" who could nonetheless manage to make a living, though it is now applied only to those with a more severe deficiency. Probably nothing has so aroused antipathy to intelligence testing as his widely-cited findings that, for example, 83 percent of the Jews and 79 percent of the Italians he tested were "feeble-minded."

Gould's interpretation of Goddard's findings is summarized as follows: "Could anyone be made to believe that four-fifths of any nation were morons?" But let us look at what Goddard actually wrote. The first sentence of his paper states that "this is not a study of immigrants in general but of six small highly selected groups" leaving out those at either end of the scale who were "obviously" either normal or feeble-minded.² At that time immigration officers were using subjective impressions to reject those people who appeared to be too retarded to learn to make a living, and Goddard hoped that tests could provide a more reliable basis for such decisions. Surprised at the results, he added a discussion that Gould conveniently ignores:

"Are these ... cases of hereditary defects or cases of apparent mental defects by deprivation? ... We know of no data on this point, but indirectly we may argue that it is far more probable that their condition is due to environment than it is due to heredity. To mention only two considerations: First, we know their environment has been poor. It seems able to account for the result. Second, this kind of immigration has been going on for 20 years. If the condition were due to hereditary feeble-mindedness we should properly expect a noticeable increase in the proportion of the feeble-minded of foreign ancestry. This is not the case."

Goddard ended up favoring the immigration of people who appeared to possess limited present intelligence: Not only would they perform useful work, but "we may be confident that their children will be of average intelligence and if rightly brought up will be good citizens." Goddard was hardly a great scientist, but he deserves a fair hearing. The statements cited here hardly warrant Gould's conclusion that to Goddard "the cure [for feeble-mindedness] seemed simple enough: don't allow native morons to breed and keep foreign ones out."

After some years, as Gould notes, most of the early enthusiasts changed their views. Goddard, Terman, and Brigham each admitted that he had overestimated the ability of tests to detect innate differences and had underestimated the influence of cultural background. One might take this example of growth in understanding as a sign of the whole field's increasing maturity and objectivity. Gould, however, sees these confessions only as support for his accusation of bias.

What is "biological determinism"?

Gould's own degree of bias is unusual in a work by a scientist. What is the source of this passion? Not mental testing itself, he makes it clear. Rather, his arguments against this testing are merely weapons for attacking the real enemy: what he calls "biological determinism."

As Gould correctly points out, early investigators who tried to measure intelligence were indeed determinists: They had the illusion that they were directly measuring a capacity determined by the genes. But while he continues to tar investigators of behavioral genetics with this brush, in fact they are now all interactionists. For while genetics necessarily began with the simplest relationships, in which a single gene determines a trait (such as the color of Mendel's peas, or a human blood type), the science eventually moved on to the quantitatively varying (metric) physical or behavioral traits, which socially are much more interesting. These were found to depend on multiple genes, and also on their cumulative interactions with the environment. This concept is now precisely formulated as the concept of heritability: a measure of what fraction of the total variance in a trait, in a particular population, is due to genetic differences between individuals--the other fraction coming from environmental influences.

Since Gould would prefer to combat the straw man of naive, "pure" determinism, he fails to note that the science of genetics has altogether replaced this concept with interactionism. But since he is too familiar with biology to deny this conceptual shift, he appropriates it for his own ideological argument: "The difference between strict hereditarians and their opponents is not, as some caricatures suggest, the belief that a child's performance is all inborn or all a function of environment and learning. I doubt that the most committed antihereditarians have ever denied the existence of innate variation among children." Curiously, "hereditarians" (Gould's misnomer for interactionists) are not credited with a similar appreciation of both factors. Instead, they are neatly skewered by being called "strict."

What, then, is the quarrel about? According to Gould, "the differences [between the camps] are more a matter of social policy and educational practice. Hereditarians view their measures of intelligence as measures of permanent inborn limits. Children, so labeled, should be sorted, trained according to their inheritance and channeled into professions appropriate for their biology." But good investigators, such as Binet, did not want mental testing to become a theory of limits. For them, Gould argues, "Mental testing becomes a theory for enhancing potential through proper education [emphasis added]."3

This is a deliberate effort to blur the issue. With one hand Gould concedes innate differences, and with the other he takes them away. If the two camps really differ mostly about social policy and not about the importance of hereditary factors, why does he struggle so to deny the latter? Similarly, whether the hereditary component is large or small, is it not a fact that individuals differ widely in their phenotypic, developed ability to absorb various kinds of education and to perform various kinds of jobs? Yet the book has not one word about the possible value of mental tests for educational and vocational placement or for comparing educational programs. (However, consistent with Gould's admiration for Binet's circumscribed aim, he does note the value of mental tests in guiding the therapy of his own child.) Finally, in describing the incredibly crude use of the Army's "Alpha" tests in 1917, Gould ignores the current use of sophisticated tests to help the armed forces select candidates for expensive training programs.

It is sad that Gould, preoccupied with the destructive social consequences of earlier biological misconceptions, is convinced that any modern studies on human behavioral genetics must have similar consequences. For to the contrary, modern evolutionary biology has had an opposite effect--by providing a powerful argument against racism. In the past, a widely-accepted justification for race discrimination stemmed from a Platonic doctrine that prevailed for over two millennia: the belief that we can best understand groups of entities (including species and races) in typological (essentialist) terms, i.e., characterizing all the individuals in a group in terms of a hypothetical ideal type or essence, and dismissing differences from the ideal as trivial. Today, however, population genetics has shown that all species are genetically diverse, and that the differences are not trivial but rather are the source of evolution. With this shift from an essentialist to a populationist view, the genetic differences between races (except for some superficial physical traits) are now seen to be statistical rather than essentially uniform. And since the statistical distributions overlap extensively from one group to another, one cannot infer an individual's potential from his race.

If the pre-genetic, typological misconceptions still prevailed, the modern revolt against race discrimination would surely have encountered much greater resistance, and it might even have been impossible. Unfortunately, biology has received little credit for this major social contribution, and none at all from Stephen Jay Gould.

The concept of general intelligence

The historical chapters, constituting most of *The Mismeasure of Man*, serve to convince the reader that the measurement of intelligence is immoral. But after this build-up, Gould, shifting from historian to scientist, offers an even sharper objection: The measurement is also unscientific.

The problem arises because these tests were developed for teachers who often have trouble deciding whether a pupil's poor performance is primarily due to limitations in motivation or to limitations in ability. The original purpose of intelligence tests, as we have noted, was to provide a more objective and reliable supplement to the teacher's subjective impression, in order to help pupils who are doing badly. But this early use of testing inevitably led to the development of additional possibilities. For example, by ranking the whole class, the tests also detected students who could move faster than the average. In addition, more specialized tests have evolved, especially for advanced students and for purposes of job placement. But as practical tools in public education, the most widely used tests are still composite ones designed, like Binet's test, to cover a range of abilities pertinent to the whole curriculum.

Psychologists generally agree that the greatest success of their field has been in intelligence testing--both practical, in estimating individual abilities, and theoretical, in exploring the cognitive functions of the human brain. For it might have turned out that the determinants of different cognitive abilities were uncorrelated: that is, that the levels of abilities might be distributed independently. But in fact, tests for different kinds of intelligence--the ability to assimilate, retain, process, and express different kinds of complex information--show a remarkably high correlation in their results. The rank-ordering of most individuals is similar--but not identical--on a verbal test, an arithmetic test, or a nonverbal test involving spatial patterns. These results confirm an impression that we all tacitly build on in our daily lives: Some people are generally brighter than others, but people also differ in their special aptitudes. Both sets of differences are partly inborn and partly due to factors affecting the development of the inborn potentials.

The common factor shared in different cognitive abilities, as determined by statistical analysis of their correlations, was named *g* by Charles Spearman. In the ordinary IQ tests it contributes well over half the variance within a population, the rest representing uncorrelated differences in special abilities. Someday, the basis for both kinds of variation will no doubt be better understood in cellular and biochemical terms. Indeed, it is encouraging that studies of the brain are rapidly progressing from its simpler integrative functions, such as the processing of visual stimuli, to more complex cognitive activities. Meanwhile, though, it is fruitful for psychologists to examine intelligence at the level of performance, and to compare ways of improving that performance, just as geneticists could usefully deal with genes as formal units long before discovering their molecular structure and mode of action.

Examined at this level, such tests have unquestionably helped innumerable teachers to identify pupils whose brightness was concealed by shyness, cultural barriers, or rebelliousness. On the

other hand, there is also no doubt that the tests have often been interpreted or applied badly. If teachers focus excessively on general intelligence, measured on a one-dimensional scale, they may fail to encourage the development of each individual's particular strengths. Moreover, the assumption that g is entirely innate may persist in some quarters even though the concept of heritability (fractionation into genetic and environmental components) has now completely replaced that early view among scientists. But perhaps the greatest danger is that the test results may tend to be regarded as some kind of index of social worth, instead of recognizing that they measure only a limited set of behavioral traits. For while these are key traits for certain educational and vocational purposes, the tests ignore many other traits that also have great social value: for example, physical attractiveness, motor skills, creativity, artistic talent, social sensitivity, and features of character and temperament. The concept of any single scale of social worth has no meaning. Gould, however, keeps the reader's indignation alive by regularly defining the objective of the tests as the measurement of "worth"--sometimes qualified as "intellectual worth," but often unqualified, or even denoted as "innate worth."

Gould is clearly not interested in evaluating the past uses of intelligence tests fairly, or in improving their use. To him the tests must be extirpated because--and here we get back to the real villain--in using them to compare individuals one inevitably runs into consistent differences in the mean values for various racial and socioeconomic groups. "This book ... is about the abstraction of intelligence as a single entity .. invariably to find that oppressed and disadvantaged groups--races, classes, or sexes--are innately inferior and deserve their status."⁴ This statement, for all its hyperbole, captures what the book is about: Concerned with group differences, Gould has decided not to add to the polemics on their causes, but to attack the problem at another level. For if he can demonstrate that the very concept of measurable intelligence is meaningless, then it follows that all those disturbing data on group differences are meaningless as well. His weapon is his "discovery," first announced in the New York Review of Books, of two alleged "deep fallacies" underlying the concept of general intelligence: reification and the factoring of intelligence.

The "deep fallacies" of reification and factoring

Gould's argument on reification purports to get at the philosophical foundation of the field. He claims that general intelligence, defined as the factor common to different cognitive abilities, is merely a mathematical abstraction; hence if we consider it a measurable attribute we are reifying it, falsely converting an abstraction into an "entity" or a "thing"--variously referred to as "a hard, quantifiable thing," "a quantifiable fundamental particle," "a thing in the most direct, material sense." Here he has dug himself a deep hole. If this implication of localization is a fallacy for general intelligence, why is it not also a fallacy for specialized forms of intelligence, which Gould professes to accept? Going even further, he seems to abandon materialism altogether: "Once intelligence becomes an entity, standard procedures of science virtually dictate that a location and physical substrate be sought for it. Since the brain is the seat of mentality, intelligence must reside there." But we must ask what reasonable scientific

alternative there is. A Cartesian dualism, in which mental processes exist apart from a material base?

Indeed, this whole argument is fantastic. The scientist does not measure "material things": He measures properties (such as length or mass), sometimes of a single "thing" (however defined), and sometimes of an organized collection of things, such as a machine, a biological organ, or an organism. In a particularly complex collection, the brain, some properties (i.e., specific functions) have been traced to narrowly-localized regions (such as the sensory or motor nuclei connected to particular parts of the body). Others, however, depend on connections between widely-separated regions. Accordingly, the reality of generalized intelligence--or equally, of any specialized cognitive ability--does not require a "quantifiable fundamental particle." Like information transfer in a telephone network or in a computer, cognition would be much the same whether the cells involved are grouped together in one region of the brain or are connected by fibers running between dispersed locations.

It is astonishing that a scientist with Gould's credentials, and with ready access to colleagues in the relevant fields, would present such a phony "discovery" as the fallacy of reification, and on the basis of truly antiquated views of neurobiology. He writes that the existence of general intelligence could have been proved correct "if biochemists had ever found Spearman's cerebral energy." This phrase refers to a particularly thin speculation, in the 1920s, about the physical basis for differences in IQ. But neurobiologists today simply do not deal in such vague concepts. Instead, they measure variation in the richness of cells, and connections, and neurotransmitter molecules in different areas of the brain.

The molecular studies linking these features of the brain to genes have hardly begun. But it is clear that this molecular biology must build on the principle that genes code for specific molecular components in brain cells, as in all other cells, and that these genes, like other genes, will vary from one individual to another. Moreover, these gene products in the brain will give rise to variation not only in its wiring diagram but also in the switches (synapses) that transmit impulses between its nerve cells. We are unlikely to be able to correlate intelligence with the incredibly complex and subtle circuitry of the brain for a long time to come; but it is not hard to imagine correlation with molecular differences in a class of synapses in different brains, affecting the speed of processing information just like differences in the transistors of different computers.

Gould's second "deep fallacy", factoring, is statistical. Here he reconstructs an old controversy, which the field has long outgrown. In this dispute, Spearman calculated g (the measure of general intelligence) by running tests for different abilities and analyzing their correlations so as to extract their common component. Thurstone, whom Gould admires as "the exterminating angel of Spearman's g ," preferred to focus on the specialized differences in intelligence. He therefore analyzed the results in a way that did not extract the overall correlation, but dispersed it among the differentiated primary factors. But the correlation did not disappear: Another

calculation could extract it from the primary factors as a "second-order" g. Gould, however, sets out to "prove" mathematically that the primary correlation is a statistical artifact and that the second-order one is negligible.

To analyze Gould's unconvincing argument would be irrelevant. For in the end, after claiming to have disproved the correlations, he casually accepts them as self-evident: "The fact of pervasive positive correlation between mental tests must be one of the most unsurprising major discoveries in the history of science." This is itself a very curious judgment. In fact, the correlation is not inevitable or self-evident, for the brain might have been so constructed that a strong endowment of cells for verbal skills would have less room for cells concerned with numerical abilities, etc. Different cognitive abilities might then exhibit no correlation, or even a negative correlation, and psychologists would then have found no general intelligence to measure.

Gould's arguments about g are irrelevant for another reason as well: Though he believes they support his aim of slaying the dragon of the heritability of intelligence, the assumed link to that problem does not exist. "The chimerical nature of g is the rotten core of Jensen's edifice, and of the entire hereditarian school. ... Spearman's g, and its attendant claim that intelligence is a single, measurable entity, provided the only theoretical justification that hereditarian theories of IQ have ever had." This assertion is utterly false. Whether an IQ test measures mostly general intelligence or mostly a collection of independent abilities, the heritability of whatever it measures will be precisely the same. IQ's factor structure simply does not enter the equations for calculating its heritability.

It is unfortunate that Gould contrasts general and special intelligence with such overkill, for the differences deserve serious consideration, and the advance of behavioral genetics, focusing on units of inheritance, will force psychologists to aim for a more refined dissection of cognitive functions. But the prospect of such advances does not require us to deny that a wider, overall measurement might have had historical value, and might still have practical value for educational purposes.

Objectivity in science

In addition to moral and technical objections to mental testing, Gould offers an epistemological argument that has much broader implications: "I criticize the myth that science itself is an objective enterprise.... By what right, other than our own biases, can we identify Broca's prejudice and hold that science now operates independently of culture and class?" On the other hand, he adds that "As a practicing scientist, I share the credo of my colleagues: I believe that a factual reality exists and that science, though often in an obtuse and erratic manner, can learn about it." This is all very well--but throughout the rest of the book he proceeds as though objectivity is a myth and no factual reality can be discovered.

In fact, the key to the success of the scientific enterprise is its passionate dedication to objectivity: Its advance depends on accepting the conclusions dictated by verifiable observations and by logic, even when they conflict with common sense or with treasured preconceptions. To be sure, some years ago Marxist philosophers, generalizing from the influence of social and economic arrangements on many aspects of our behavior, initiated an attack on the objectivity of science. Moreover, this view has become rather widely accepted in the social sciences. But the study of the genetics of intelligence is a part of natural science, rather than of social science, even though its findings have relevance for social questions. If the science is well done it will tell us objectively what exists, without value judgments; these judgments will arise only in the social applications of that knowledge. For example, insights into the range and distribution of abilities do not tell us how much of our educational resources to devote to the gifted and how much to the intellectually handicapped; this knowledge simply improves our recognition of the reality with which we must cope.

The main source of confusion here is that the word "science" is used with three different meanings, in different contexts: science as a set of activities, as a methodology, and as a body of knowledge. The activities of a scientist certainly depend heavily on non-objective factors. These include the resources and the incentives that a society provides for pursuing particular projects, and also the personal choice of problems, hypotheses, and experimental design. The methodology of science is much more objective, but it is also influenced by fashions in the scientific community. The body of scientific knowledge, however, is a very different matter. Its observations and conclusions, after having been sufficiently verified and built upon, correspond to reality more objectively and reliably than any other form of knowledge achieved by man. To be sure, attachment to a cherished hypothesis may lead a scientist into error. Moreover, at the cutting edge of a science, contradictory results and interpretations are common. But the mistakes are eventually discarded, through a finely honed system of communal criticisms and verification. Thus Broca's name has been immortalized by its assignment to a structure in the brain that he recognized, whereas his premature efforts to correlate gross structural variations with intelligence have left no residue in the body of scientific knowledge.

Accordingly, however much the findings in some areas of science may be relevant to our social judgments, they are obtained by a method designed to separate objective analysis of nature from subjective value judgments. Long experience has shown that when these findings are well-verified, they have an exceedingly high probability of being universal, cumulative, and value-free. Gould, however, treats the history of science like political history, with which his readers are more familiar: a history in which human motives and errors from the past will inevitably recur. He thus skillfully promotes a doubt that the biological roots of human behavior can ever be explored scientifically.

Politicizing and publicizing science

A left-wing group called "Science for the People," of which Gould is a member, has been

particularly active in campaigning against such studies. Instead of focusing, in the earlier tradition of radical groups, on defects in our political and economic system that demand radical change, this group has aimed at politicizing science, attacking in particular any aspect of genetics that may have social implications. Their targets have included genetic engineering, research on the effects of an XYY set of chromosomes, sociobiology, and efforts to measure the heritability of intelligence. Several years ago Gould co-signed their intemperate attack on E.O. Wilson's *Sociobiology: The New Synthesis*.⁵ Now, in *The Mismeasure of Man*, he has extended the attack to cognitive psychology and educational testing, because they may reveal genetic differences.

Gould has spelled out explicitly his ideological commitment, and also its influence on his science. As we shall see, his main scientific contribution has been the claim that evolution has occurred mainly through revolutionary jumps, rather than by small steps. Both in a "Dialectics Workshop"⁶ and in a scientific paper⁷ he supports this claim with a citation from Marx: "Darwin's gradualism was part of the cultural context, not of nature." He adds that "alternate [sic] conceptions of change have respectable pedigrees in philosophy. Hegel's dialectical laws, translated into a materialist context ... are explicitly punctuational, as befits a theory of revolutionary transformation in human society." And, "it may also not be irrelevant to our personal preferences [about evolutionary mechanisms] that one of us learned his Marxism, literally at his Daddy's knee." To most scientists (other than those tethered to a party line) such a claim of support from (or for) Hegel is silly, and such an insertion of an ideological preference, whether from the left or the right, is a corruption of science.

These quotations may help us to understand why *The Mismeasure of Man* ends up as a sophisticated piece of political propaganda, rather than as a balanced scientific analysis. Gould is entitled, of course, to whatever political views he wishes. But the reader is also entitled to be aware of his agenda.

It may also be pertinent to comment briefly on Gould's scientific writing. His claim to have disproved the widely-accepted, "gradualist" view of evolution has had great appeal for science reporters, but it has been subject to intense criticism by his professional colleagues. Of course, controversies in science are not rare, and it would not be appropriate here to try to judge Gould's stature as a scientist. It is pertinent, however, to note features of his professional writing remarkably similar to those that I have criticized in *The Mismeasure of Man*. In both contexts he focuses primarily on older approaches to problems in which genetics is now central; he picks his history; and he handles key concepts in an ambiguous manner. Moreover, he is fond of artificial dichotomies that oversimplify complex issues: evolution by leaps versus evolution by gradual steps; biological determinists versus environmentalists; general intelligence versus specialized intelligence.

While Gould has made a valuable scientific contribution in providing evidence that marked fluctuations in rate are common in evolution, the most general professional criticism is that in

dramatizing this contribution he has set up a non-existent conflict with the prevailing gradualist view. For he proceeds as though gradualism implies a relatively constant rate as well as small steps. But even Darwin recognized that the rate of evolution might vary widely, and modern investigators have demonstrated many mechanisms that contribute to such fluctuation.

Neo-Lysenkoism

In *The Mismeasure of Man* Gould fails to live up to the trust engendered by his credentials. His historical account is highly selective; he asserts the non-objectivity of science so that he can test for scientific truth, flagrantly, by the standards of his own social and political convictions; and by linking his critique to the quest for fairness and justice, he exploits the generous instincts of his readers. Moreover, while he is admired as a clear writer, in the sense of effective communication, he is not clear in the deeper sense of analyzing ideas sharply and with logical rigor, as we have a right to expect of a disciplined scientist.

It has been uncomfortable to dissect a colleague's book and his background so critically. But I have felt obliged to do so because Gould's public influence, well-earned for his popular writing on less political questions, is being put to mischievous political use in this book. Moreover, its success undermines the ideal of objectivity in scientific expositions, and also reflects a chronic problem of literary publications. My task has been all the more unpleasant because I do not doubt Gould's sincerity in seeking a more just and generous world, and I thoroughly share his conviction that racism remains one of the greatest obstacles.

Unfortunately, the approach that Gould has used to combat racism has serious defects. Instead of recognizing the value of eliminating bias, his answer is to press for equal and opposite bias, in a virtuous direction--not recognizing the irony and the danger of thus subordinating science to fashions of the day. Moreover, as a student of evolution he might have been expected to build on a profound insight of modern genetics and evolutionary biology: that the human species, and each race within it, possesses a wide range of genetic diversity. But instead of emphasizing the importance of recognizing that diversity, Gould remains locked in combat with a prescientific typological view of heredity, and this position leads him to oppose studies of behavioral genetics altogether. As the reviewer for *Nature* stated, *The Mismeasure of Man* is "a book which exemplifies its own thesis. It is a masterpiece of propaganda, researched in the service of a point of view rather than written from a fund of knowledge."

In effect, we see here Lysenkoism risen again: an effort to outlaw a field of science because it conflicts with a political dogma. To be sure, the new version is more limited in scope, and it does not use the punitive powers of a totalitarian state, as Trofim Lysenko did in the Soviet Union to suppress all of genetics between 1935 and 1965. But that is not necessary in our system: A chilling atmosphere is quite sufficient to prevent funding agencies, investigators, and graduate students from exploring a taboo area. And such Neo-Lysenkoist politicization of science, from both the left and the right, is likely to grow, as biology increasingly affects our

lives--probing the secrets of our genes and our brain, reshaping our image of our origins and our nature, and adding new dimensions to our understanding of social behavior. When ideologically committed scientists try to suppress this knowledge they jeopardize a great deal, for without the ideal of objectivity science loses its strength.

Because this feature of science is such a precious asset, the crucial lesson to be drawn from the case of Stephen Jay Gould is the danger of propagating political views under the guise of science. Moreover, this end was furthered, wittingly or not, by the many reviewers whose evaluations were virtually projective tests of their political convictions. For these reviews reflected enormous relief: A voice of scientific authority now assures us that biological diversity does not set serious limits to the goal of equality, and so we will not have to wrestle with the painful problem of refining what we mean by equality.

In scientific journals editors take pains to seek reviewers who can bring true expertise to the evaluation of a book. It is all the more important for editors of literary publications to do likewise, for when a book speaks with scientific authority on a controversial social issue, the innocent lay reader particularly needs protection from propaganda. Science can make a great contribution toward solving our social problems by helping us to base our policies and judgments upon reality, rather than upon wish or conjecture. Because this influence is so powerful it is essential for such contributions to be judged critically, by the standards of science.

Footnotes

1 Stephen Jay Gould, *The Mismeasure of Man* (New York: Norton, 1981).

2 H. H. Goddard, "Mental Tests and the Immigrant," *Journal of Delinquency* 2 (1917): 243.

3 Gould's reference to "enhancing potential" is revealing, for it confuses genotype (an inborn range of potential) and phenotype (the actual ability developed within that range). He should have spoken instead of enhancing performance, or of enhancing the development of potential. This is not a trivial semantic distinction: It is essential for any clear analysis of the interaction of genes and environment. Gould's language suggests that he either does not fully understand, or feels compelled to ignore, this key concept of genetics.

4 Gould's broad generalization ignores the fact that the disadvantaged Chinese and Japanese in this country have consistently scored even higher than Caucasians. Moreover, in including sex discrimination in the IQ controversy, he is straying far from reality. In fact, females average the same as males on standard IQ tests: They perform slightly better on verbal tests, and slightly worse on spatial tests, but the tests are constructed to balance these differences.

5 E. Allen et al., Letter, *New York Review of Books* (November 13, 1975): 43. See also *Sociobiology Study Group of Science for the People in Bioscience* 26 (1976): 182. This article includes the remarkable statement that "We know of no relevant constraint placed on social processes by human biology."

6 S. J. Gould, "The Episodic Nature of Change versus the Dogma of Gradualism," *Science and Nature* 2 (1979): 5.

7 S. J. Gould and N. Eldridge, "Punctuated Equilibria: The Tempo and Mode of Evolution Reconsidered," *Paleobiology* 3 (1977): 115.

Times Corrects Scientist's Obit

Constance Holden, 18 February 1994, *Science*, 263, p. 922.

Harvard molecular biologist Bernard Davis only died once, on 14 January, but has been accorded two obituaries in the *New York Times*. Why? The first obit managed to ignore almost all of Davis' career--igniting a storm of protest from former colleagues who badgered the newspaper until it agreed to do the story over.

The first obituary, published on 17 January, was a short item that highlighted a 1976 controversy in which Davis expressed worries that affirmative action efforts were lowering the academic standards at some medical schools. It made no mention of his scientific accomplishments, including pioneering work in bacterial genetics, his involvement in issues relating to science and society, and his numerous honors and publications.

Davis' former colleagues were appalled. "Inadequate and mean and distorted," is what Stanford Nobelist Arthur Kornberg called the obit; an example of the press zeroing in on "a trivial political incident at the expense of one of the finest scientific careers in America," said rheumatologist Gerald Weissman of New York University Medical Center.

In response to a storm of letters from scientists, the newspaper quickly capitulated, and on 3 February it ran a longer story with a note observing that the first one was "incomplete." Davis' friends are happy. "We were so pleased we got a retraction, as it were," says Weissman, who authored one of the letters along with 12 colleagues.

Kings of Men: a Special Issue of the journal INTELLIGENCE about Arthur Jensen

Kings of Men: Introduction to a Special Issue of the Journal of INTELLIGENCE (1998)

by DOUGLAS K. DETTERMAN

Case Western Reserve University

This special issue is dedicated -- to Arthur Jensen. It has become apparent that he is unlikely to receive the recognition his work merits. The issue begins with a statement by Jensen which discusses some of his work people are less familiar with. His bibliography is also reprinted. A number of persons selected for their diversity in outlook then comment on the work of Arthur Jensen and the impact it has had.

This special issue is devoted to Arthur Jensen. Several years ago it became apparent to me that Arthur Jensen would probably never receive the kind of recognition others with even lesser accomplishments have been given. He will not receive the honors his work merits from organizations like the American Psychological Association, the National Academy of Science, or the National Association for the Advancement of Science, to name a few. The reasons for this lack of recognition are obvious. He has taken controversial and politically unpopular stands on issues that are important to the study of intelligence.

To attempt to rectify this situation, I contacted him and asked that he allow Intelligence to do a special issue in his honor. My plan was to have him write an introduction that would describe his career. This would be followed by commentary on his work by a wide assortment of researchers in the field. Not surprisingly, the one addition he requested was that a list of his publications be included. He has had a highly productive career and, I must say, I was not fully aware of the extent of his interests until I saw the list of publications.

The plan originally formulated has been carried out in this issue of Intelligence. In his personal statement, you will see that Jensen emphasizes work that may be less familiar to many readers but is no less important. The commentaries on Jensen's work are well worth reading. They tell you as much about the commentators as about Jensen. You will also see that even those who strongly disagree with Jensen have high respect for his intellectual integrity and what he has accomplished. Though this volume stands as a tribute to Arthur Jensen by his contemporaries, like all scientists, his ultimate recognition will be the degree of acceptance of the ideas he has developed.

What has Jensen accomplished in his career? By any measure, Arthur Jensen has made substantial contributions to the study of human intelligence. While opinion may differ about what his most important contributions have been, I have three that I think would rank high on anyone's list.

Genetics. It is hard to remember how dominant environmental thinking was just 30 years ago. Many thought that even mental retardation could be cured by purely environmental interventions. The genetics of intelligence were seldom discussed. Jensen's Harvard Educational Review article and subsequent publications on the genetics of intelligence had an enormous effect on the zeitgeist. It was no longer possible to ignore genetic influences when discussing intelligence. He paved the way for the many behavior geneticists who were to follow in his footsteps.

We have still not realized the full ramifications of this change. For example, not everyone yet fully appreciates that genetics will have to be taken into account when considering environmental variables. Much of the research that was done on the effect of so called environmental variables is worthless because those studies failed to partial out genetic influences and, so, are hopelessly confounded. Among the most discerning, there is a new appreciation for the methodologies that will have to be used to truly understand the environment. Year's from now we may realize that our appreciation of genetic influences was the first step over the threshold to a better understanding of the environment.

Cognition and the Brain. Jensen's early work on reaction time and intelligence focused interest on cognition and its relationship to brain processes and how cognition and brain processes relate to intelligence. A better appreciation of the cognition-brain-intelligence relationship is critical to ultimately understanding intelligence. Though Jensen was not the only one to appreciate this, his work was certainly pivotal. What seemed to impress people most was that such a simple task as choice reaction time correlated with intelligence.

While we are now in only the earliest phases of understanding the cognition-brain-intelligence relationship, there is no question that is where the field is heading. Techniques for studying this relationship like averaged evoked potentials, PET, and fMRI are increasingly being used and reported upon. The future is promising for these tools. But without an appreciation of the brain-cognition-intelligence relationship it is unlikely they would have

been used at all.

g. Without question, Jensen's most significant contribution has been to show the importance of general intelligence, or g. The idea introduced by Spearman, while still a graduate student in 1904, reached its highest pinnacle yet in Jensen's (1998) recent book, *The g factor: The science of mental ability*. Besides being beautifully written, I predict the book will be the foundation for research for decades to come. It is a summary, that nearly anyone can read, of the research that

makes *g* such an important concept. No one can fully understand individual differences without an understanding of general intelligence and its implications.

Jensen has been the major champion of the concept of *g* over the last two decades. He has shown that of all individual differences so far demonstrated, *g* is the most powerful both as a scientific construct and in the prediction of every day performance. He has crystallized methods for studying *g* and applied those methods. His work on *g* alone is sufficient for a distinguished scientific career.

Why has Arthur Jensen accomplished what he has accomplished? It seems reasonable to ask why he has accomplished so much if for no other reason than to understand scientific achievement. I think there are a number of personal characteristics that were important in his success. I have had the chance to observe him closely over the last 25 years and these conclusions are based on those observations.

Smart. Jensen comes up with more good ideas than anyone I have known. In the course of reviewing for *Intelligence*, I have seen countless times when he has suggested ideas for studies to people that have been successfully carried out. He receives no credit for this and, in most cases, is never acknowledged for his contribution. I once asked him why he didn't carry out some of these good ideas himself. He told me he had more things than he could possibly do and the important thing was to see the work done to advance the field.

His published work is testament to his clear and insightful thinking. The work is always understandable and usually makes a fundamental point. There may be people who publish more, but I am sure there are very few whose publications reflect as many good ideas as Jensen's do.

Tenacity Developed from a Love of His Work. Jensen sticks to an idea when he knows he is right. There are few people who have a firmer sense of what is right and what is wrong and who are willing to follow their own instincts about what is right. His tenacity is propelled by a real enjoyment of the work he does. If you talk to him about intelligence, it is hard not to become excited yourself because of the enthusiasm he shows. It is clear he really loves the pursuit of answers in this field for their own sake.

Agnosticism and Open Mindedness. In his own statement in this issue, he admits to a healthy agnosticism about everything. This is particularly true about intelligence. He has no investment about how a question comes out, he simply wants it answered correctly. For years, his critics have called him every name in the book and have accused him of all kinds of biases and prejudices. In fact, I have never known anybody with fewer prejudices. The biggest prejudices scientists usually have are those in favor of their own ideas. Such prejudices are very hard to avoid and the notion of the "objective" scientist is, for most of us, a goal we fail to achieve. However, Jensen has no loyalty whatsoever to any theory or hypothesis even if they come from his own ideas. He would gladly know the truth even if it proved him wrong. In fact, he would be

excited to know the truth.

His agnosticism is one of the characteristics that it took me longest to identify. I think that is because it is such an unusual one and not typical of most others I have known. When I first met him personally, I wondered what his biases and prejudices really were and tried to identify them for many years. My effort was wasted. I finally came to the conclusion that he just doesn't have any. I think this may be a point that is impossible for his critics to understand. On the other hand, it is the very reason he has stood up so well against his critics. He has invested himself in pursuit of the truth, not any particular set of ideas.

Thick Skin. I doubt that there have been few people in the history of science who have suffered more criticism than Jensen. There are other examples, of course, including Galileo, Darwin and others. But I doubt if any of them had to have police guards or were regularly threatened with acts of physical violence. I have heard all sorts of rumors about Jensen. One of the most interesting was that he conspired with the Nixon Whitehouse to kill Headstart. I asked him about this and he had a recollection of someone asking him about his research but there was no conspiracy. What is ludicrous about this rumor is that Headstart spending increased dramatically during the Nixon administration (Caruso, Taylor, & Detterman, 1988). There have been many other rumors and gossip, but the ones I have been able to check out have all been false.

Besides vociferous attacks from organized opposition, Jensen has also had to suffer the indignity of seeing his research and writing systematically misrepresented in the popular press. Many of the articles that I have read in the popular press have made me wonder how much of Jensen's work the author had actually read. I am sure that this misrepresentation would be the most difficult part for me to withstand. However, in the years I have known him, I have never heard him complain about this treatment or express any sentiment of unfairness. I always wondered why. It was not long ago that I figured it out. Because he has no commitment to any particular outcome, Jensen finds it amusing, and perhaps humorous, that people become so exorcised about ideas, ideas that could be right or wrong. Instead of applying their intellect to finding out if these ideas hold water, they express their emotions against the message bearer. The saddest part of the whole thing is that the criticisms that have been directed against Jensen have led to little, if anything, of lasting scientific value. Viewed in this way, the effort expended in futile activity is rather ironically humorous.

One of the incidents that typifies many of Jensen's personal characteristics occurred when he came to Case Western Reserve University to give a colloquium. The talk was open to the university community and drew a large crowd. Among those in the crowd were several members of the local Communist Party. They had come to hear him talk about race and intelligence but, instead, he had just begun his reaction time research and was talking about that. During his presentation they listened attentively and politely, as is the custom of all Midwesterners, even members of the Communist Party. At the end of the presentation, there was time for questions and they asked a few pointed ones showing that they had studied up for Jensen's appearance. (In

fact, they had probably read more of Jensen than most in the audience.)

After the talk ended, there was a reception in the lobby. As he was drinking his wine and eating his cheese, Jensen slowly made his way around the room working toward the Communist Party members who were bunched in a corner. He was probably drawn to them because it was clear that they were among the best informed about his work even though they had philosophical differences. Maybe it was the philosophical differences' that attracted Jensen to them. I will never be sure. They began asking him questions about intelligence which he enthusiastically answered. The conversation went on for some time. The rest of the audience drifted away and the caterers began cleaning up. Jensen carried on enthusiastically and, at least in my opinion, his opponents were loosing badly. Looking for a way out, the Communist Party members slowly began backing towards the door. But Jensen was just getting started and for every step backward they took toward the door, he took one forward both figuratively and literally. Feeling a bit sorry for them by this time, I told Dr. Jensen that we had to leave for dinner. Taking the opportunity, the representatives of the Communist Party bolted for the door and began walking east on Euclid Avenue. You could see that Jensen was disappointed to loose his sparring partners. He quickly asked which way we were going to dinner. I said we first had to return to my office which was east on Euclid. Quickly, he proceeded me out the door and caught up to his victims. The discussion proceeded down Euclid Avenue until our ways had to part. I think this encounter was the highlight of Jensen's visit.

Solitude. Finally, I think one thing that Jensen has enjoyed as a result of his notoriety is a kind of solitude in which to think, work, and write. Even those who become moderately successful in this business are asked to do many things they don't really want to do and that don't contribute to their scientific accomplishment. Because many have regarded him as a social outcast, he has been spared many of these nearly meaningless activities that he would have had to carry out if he had been in the good graces of those in power. Add to this a wife who Jensen acknowledges has left him totally free to pursue his research and you have what seems to me a nearly ideal circumstance for a scientific career. My one concern in doing this issue is that we could ruin all of that by giving him the recognition he deserves. Let's hope that doesn't happen.

The following quote is one of my favorite from Galton. It describes general intelligence and those who possess it in high quantity. Galton never knew Jensen but I am sure that he had men like him in mind when he wrote this:

"People lay too much stress on apparent specialties, thinking over rashly that because a man is devoted to some pursuit he could not possibly have succeeded in anything else. They might just as well say that because a youth had fallen desperately in love with a brunette, he could not possibly have fallen in love with a blonde. He may or may not have more natural liking for the former type of beauty than the latter, but it is as probable as not that the affair was mainly or wholly due to a general amorousness of disposition. It is just the same with special pursuits. A gifted man is often capricious and fickle before he selects his occupation, but when it has been

chosen he devotes himself to it with a truly passionate ardour. After a man of genius has selected his hobby, and so adapted himself to it as to seem unfitted for any other occupation in life and to be possessed of but one special aptitude, I often notice, with admiration, how well he bears himself when circumstances suddenly thrust him into a strange position. He will display an insight into new conditions, and a power of dealing with them, with which even his most intimate friends were unprepared to accredit him. Many a presumptuous fool has mistaken indifference and neglect for incapacity; and in trying to throw a man of genius on ground where he was unprepared for attack, has himself received a most severe and unexpected fall. I am sure that no one who has had the privilege of mixing in the society of the abler men of any great capital, or who is acquainted with the biographies of the heroes of history, can doubt the existence of grand human animals, of natures pre-eminently noble, of individuals born to be kings of men. (Galton, 1869, pp. 24-25)"

I think if you read this issue cover to cover, you will find that no matter what your opinions are on the issues, no matter who is right or wrong, Arthur Jensen is a man to be respected not only for what he has accomplished but for who he is. Thank you, Professor Jensen.

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Intensive, Detailed, Exhaustive by THOMAS J. BOUCHARD, JR., University of Minnesota

Arthur Jensen's bibliography is characterized as breathtaking and his scientific work as intensive, detailed, exhaustive, fair-minded, temperate, and courageous. Specific articles and books are targeted as must reading. I argue that Jensen's characterization of the influence of the Berkeley psychology department in the 1940's reflects his own intellectual biases rather than those of the department. Jensen's work is praised as an extension of the British Biological-Theoretical Tradition which attempts to integrate psychological, biological, social genetic, sociological, and cultural processes in a coherent theoretical framework. A new definition of Jensenism. based on the Jansenist heresy, is provided.

Upon reading both Arthur Jensen's bibliography and his new book, *The g Factor: The Science of Mental Ability*, in the same week only one word comes to mind-"breathtaking". Reading his bibliography is as much a delight as reading his books and papers, truly an intellectual feast. As a fellow Galtonian I will point out a few facts the casual reader might miss if they did not count items and have not read much of Jensen's work; a) he is the first author on 357 of the 384 items, b) he is the sole author of 319 of the 384 items, c) he has four citation classics, d) he has published nearly 10 items a year (including books) since 1962, e) there is no indication that he is slowing down, and f) the quality is not only superb, it is getting better! One disconcerting feature of the bibliography is the paucity of items that have been reprinted. I was stunned, for example,

to see the classic 1977 article, "Cumulative deficit in IQ of blacks in the rural South", reprinted only once. It is still the definitive paper on the topic. I suspect that the reason so few papers have been reprinted is the same one that has resulted in his not having been given the numerous honors other scientists of his stature have already received. He has dared to study and speak straight forwardly about important issues that most other social scientists only whisper about -- race and class differences in IQ, lack of bias in intelligence testing, the biological basis of general intelligence, genetic influences on intelligence, and fallacious research methods in developmental psychology. This point can be nicely illustrated by comparing the way Jensen was treated when he visited the University of Minnesota in 1976 and the way Todd Risely was treated on a recent visit. Jensen had been invited to speak on his new work dealing with test bias by the Institute of Child Development (ICD). I had been asked by Scarr, the invitee, to sit in the front row of the auditorium with her because she had heard that he might be attacked. Attacked he was. He was overwhelmed on stage by some extremely hostile members of the audience. She, I, and the police in attendance had to escort him out to safety. He was able to make a presentation to a small audience at ICD later in the day. What the University community was not allowed to hear was a synopsis of work that has now become the definitive statement on test bias, work which has completely reversed professional opinion on this issue. Almost everything which has followed is derivative. In 1997, Risley was invited to the University of Minnesota by the Institute of Child Development where he expounded on his findings reported in the book, "Meaningful differences in the every day experiences of young American children" (Hart & Risley, 1995). Hart and Risley reported on a long-term within-family correlational study in which they show a high correlation between parental language diversity and children's IQ. This work was cited by President Clinton during the 1997 White House Conference on Children (UPI, 1997). In his work Jensen has repeatedly emphasized the behavior genetic dictum that correlations between parental behavior and child behavior computed on biological relatives reared together are completely uninterpretable. This fundamental methodological flaw, repeatedly committed by many psychologists, is a simple variation on the argument that "correlation does not mean causation". For reasons, that I cannot fathom, warnings about this elementary flaw have still not been incorporated into many introductory statistics and methodology textbooks (an exception is Ellis (1994)). One has to ask about the viability of a science that allows the consistent repetition of a serious methodological flaw pointed out and solved by Galton (by the use of the adoption design) over 150 years ago. It is not as if no one noticed Galton's admonitions. The problem was discussed in great detail by Burks (1928a, 1928b, 1938). In recent years it has been written about in great detail by Meehl (1970, 1971, 1978), Scarr (1981, 1992, 1997, 1978) and in other guises by Plomin (1994).

WHAT EVERY PSYCHOLOGIST SHOULD READ

Upon examining his bibliography I am embarrassed at the number of Jensen's publications that I have not read. That will not, however, keep me from making some recommendation to readers who are much less familiar with his work. From the early work read, "The Stroop Color-Word Test: A review" (Jensen & Rohwer, 1966). The 1969 Harvard Educational Review (HER) article, "How much can we boost IQ and scholastic achievement?", (Jensen, 1969) is still a gem

as are the replies to critics. Some critics have argued this article is a citation classic because it is often cited solely for purposes of refutation. I have no doubt that many who cite it for the purpose of refutation have not read it. I recommend it, however, because it is a true classic. Better yet read his book *Genetics and Education* (Jensen, 1972) in its entirety as it contains the HER article and numerous other superb papers. Jensen, of course, makes a few mistakes now and then as Kamin (1975) points out in his review of this book. The history of one of the mistakes is fascinating. Jensen reprinted a graph that included a data point, for dizygotic twins reared apart -- a sample of IQ kin data that did not exist at the time. According to Kamin this kind of error reflects the bias of those who take a genetic position. Locurto (1991), however, informs us that the graph came from an article by Heber, Dever, and Conroy (1968). The senior author of that paper was in fact a well known environmentalist (see pages 63-66 in Locurto's book for a discussion of Heber).

If you are somewhat interested in behavior genetics and don't know much beyond high school genetics, and would like a primer in quantitative genetics read, "Genetic and behavioral effects of nonrandom mating" (Jensen, 1978). If you want to know something about psychometrics and the issue of bias in mental testing the definitive work is still "Bias in mental testing" (Jensen, 1980a). If you are short on time the *Behavior and Brain Science* summary of "Bias in mental testing" (Jensen, 1980b) will give you a very good overview of the bias issue. If, like me, you have wondered about Stephen J. Gould's veracity and competence in the mental ability domain you must read Jensen's review of "The mismeasure of man". The title of the review is "The debunking of scientific fossils and straw persons" (Jensen, 1982) and it is among Jensen's very best book reviews. I would recommend it be followed up with Phil Rushton's review of the revised edition of the same book (Rushton, 1997). If you still need more criticism of Gould read Dennett's (1995) assessment of Gould. Alas as I write these words I find that S. J. Gould has been elected president of the American Association for the Advancement of Science (AAAS). The only solace I can garner from this event is that the AAAS once elected Margaret Mead as its president (Freeman, 1983; Freeman, 1991; Freeman, 1992). Mistakes will be made, but some seem more egregious than others.

While doing my simple counts of Jensen's work it occurred to me that Jensen would have analyzed "the data" differently. He would have argued that it is imperative to remove redundancy and artifacts, he would have grouped the papers by type, by source of publication, by decade. etc., and he would have thrown much more light on the topic. To use the title of one of his book reviews it would have been "Intensive, detailed, exhaustive". Indeed these three terms capture much of the flavor of Jensen's writings. I should also add fair-minded, temperate, and courageous. For someone who has been attacked so vituperatively, both in public and in the published literature, I continue to be astounded at the lack of anger and hostility in his replies and the astuteness with which he dissects the arguments of his critics. To use a psychoanalytic metaphor, I am inclined to believe that he sublimates anger and hostility into mental energy -- see his astute discussion of the construct of mental energy in Jensen (1997).

I suspect if you asked other Galtonians what they would recommend as "must reading" the list would be somewhat different from mine. There is so much excellent material to choose from that if only a few lists were combined the final list would virtually exhaust his bibliography.

Jensen's writings are virtual tutorials on how to write science and how to deal with controversy -- stick to the available evidence, put all the evidence in its full context, carefully explain the methods, their rationale and the assumptions, acknowledge the lack of evidence when it does not exist and avoid ad hominem arguments. In other words stick to the evidence and be intensive, detailed and exhaustive.

A DIGRESSION ON BERKELEY AND WHO INFLUENCES WHOM

I found Jensen's description of how, in the psychology department at Berkeley in the 1940's, genetic influences on individual differences were neglected somewhat misleading. His description should have been tempered by the recognition that Tolman in a very early paper titled, "The inheritance of maze-learning ability rats" (1924) took a clear position on the importance of genetic factors as they influence behavior. Gerald McClearn (1962) provides a concise history of this period at Berkeley. Tolman strongly encouraged Tryon to study genetic influence on behavior and they collaborated to develop a self-recording maze to collect data from the selectively bred animals (Tolman, Tryon, & Jeffress, 1929). Tryon published at least 12 papers on individual differences and genetic influences on learning ability in rats between 1929 and 1941. The first, in 1929, was titled "The genetics of learning ability in rats". This research program resulted in the famous Tryon maze-bright and maze-dull rat strains. Heron (1935) replicated the Tryon work at Minnesota shortly thereafter. Most psychologists are not aware of the fact that Heron published, with Skinner, (Heron & Skinner, 1940), a paper comparing the rate of bar pressing in the maze-bright and maze-dull rats (the "brights" had a higher rate!). My point here is that the idea of genetic influences on behavior was alive and well at Berkeley when Jensen was there. For some reason it did not "infect" him. I am sad to report that much the same thing happened to me. I entered Berkeley as a sophomore in 1963 and also received an education strongly biased in the direction of experimental (environmental) psychology. As a graduate student in the same department, however, I recall Tryon's spellbinding introductory psychology lectures -- I was a teaching assistant in the course -- that incorporated behavior genetic findings. Tryon anticipated Jensen's work and the arguments of "The Bell Curve" (segregation of cognitive classes in American society) by many years. My colleagues at Minnesota tell me that Patterson did also, a claim supported by calls from his students in the 40's asking me what the fuss about "The Bell Curve" was all about, "Wasn't it old news?". The importance of the ideas Tryon was talking about simply did not fully register in my mind. I did not relate them to my own interests in personality and social psychology. Gerald McClearn was also on the Berkeley faculty, teaching Behavior Genetics at this time (he went on to Colorado to found the Institute for Behavioral Genetics), but unfortunately we did not have any contact. Fortunately, Harrison Gough -- my advisor -- required me to read the first textbook in behavior genetics (Fuller & Thompson, 1960) for my special exams and this gave some sense of the field. I also recall Frank

Barron presenting, in a very positive manner, the classic meta-analysis of the IQ literature by Erlenmeyer-Kimling and Jarvik (1963) updated in 1981 by Bouchard and McGue (1981) -- to an Institute of Personality Assessment and Research seminar. No one seemed to have been aware of the importance of this paper. Nor did they take it seriously, as IQ was out of style in those days. The intrepid Barron, however, had already carried out an early twin study of creativity (Barron & Parisi, 1976). The importance of work in behavior genetics remained only on the periphery of my consciousness until the appearance of Jensen's 1969 HER paper. I had taught a course on Human Intelligence at the University of California Santa Barbara using the textbook by Hunt (1961). Even though I had only a rudimentary knowledge of behavior genetics I had found the book very unsatisfactory in its treatment of genetic influences. Jensen's monograph exploded on the scene like a bombshell and I immediately wrote and asked him for a copy. The 1969 monograph and Jensen's subsequent writing have changed the field of behavior genetics and individual differences in fundamental ways. I report this long anecdote about the Berkeley psychology department because I believe we really do not know why or how people are influenced by the environmental context in which they find themselves. Why, for example, did Jensen become enamored with Hull's theory instead of Tolman's which explicitly recognized the role of heredity and individual differences? Jensen, of course agrees with me on this point. As he succinctly puts it, "It always amazed to see psychologists offering glib explanations of some immensely complicated behavioral individual incident when psychological science has not even provided explanations for comparatively simple phenomenon ."

MEMBERSHIP IN THE LONDON SCHOOL

Now that I have castigated others for the sin of assuming they know how we have been influenced by our environment I will proceed to commit the same sin. One consistent feature of Jensen's research career is his love of theoretical models with elemental parts and clear quantitative implications. These feature characterize Hullian learning theory, the serial position effect, the verbal learning (experimental) tradition he found himself in at the Human Learning Center in Berkeley, the Level I-Level II theory of group differences, and quantitative behavior genetic theory. This pattern of intellectual interests early on led him to become a member of the The London School. I prefer to call the London School the British Biological-Theoretical Tradition because, a) the latter term puts the origins of the group in a large context (Darwin and Galton came well before the University of London which is the London referred to in the term London School), b) it describes the approach of the group and, c) it provides a nice contrast with what I call the French Clinical-Therapeutic Tradition. The British Biological-Theoretical Tradition has been attacked on a variety of grounds (reductionistic, anti-egalitarian, racist, cold and heartless, etc.) but the most vehement arguments have been against its biological orientation. Consider the following quote, "The interpretation of IQ data has always taken place, as it must, in a social and political context, and the validity of the data cannot be fully assessed without reference to that context. That is in general true of social science, and no amount of biology-worship by behavior geneticists can transfer IQ testing from the social to the biological sciences (Kamin, 1974, p. 2)." Lewontin, Rose, and Kamin (1984) have extended this argument to all behavioral traits including psychopathology. These critics have cut to the heart of the matter.

The goal of British Biological-Theoretical Tradition has indeed been, since the time of Galton, to integrate psychology, biology, and genetics (Bouchard, 1996). "The g Factor: The science of mental ability" is a direct descendant of Galton's book "Hereditary Genius" and Spearman's book "The abilities of man" (1927). It is a brilliant work. It pushes the goal of British Biological-Theoretical Tradition a giant step forward. I challenge the reader to examine Jensen's magnum opus and decide for him or herself if it has crossed the threshold from the social to the biological sciences. It is worth noting that E.O. Wilson's recent book, "Consilience: The Unity of Knowledge" (Wilson, 1998), defends a very similar but even broader research program.

While reading "The g Factor" I was struck by Jensen's detailed knowledge of the lives of many of the important historical figures in the IQ story. His bibliography explains why he is so knowledgeable. In 1984 he wrote bibliographic entries for the Encyclopedia of Psychology on Galton, Pearson, Spearman, and Thurstone and in 1994 he wrote bibliographic entries for Galton, Spearman, and Eysenck for the Encyclopedia of Intelligence. More recommended reading.

"JENSENISM"

Jensen reported in his commentary in this issue the definition of "Jensenism", taken from current dictionaries, in order to try to free himself from its grip. I don't think this is possible, consequently, I thought it might be worth preparing a proper and more comprehensive definition that praises Jensen. My definition is anticipatory and includes the effect of his magnum opus, "The g Factor". My definition mimics the definition of an older heresy -- Jansensim (See encyclopedia Britannica 15th Ed., Micropaedia, p. 515)

Jensenism: A scientific movement of unorthodox tendencies (heresy) that appeared chiefly in the United States in the late 1960's. The movement was scientific (religious) in origin, arising out of the theoretical (theological) problem of reconciling the empirical observation of massive and important individual differences in intelligence as well as a large and persistent black-white difference in intelligence (lack of divine grace) with the belief that all men are created equal (human freedom). Jensenism exalts the influence of the genes (grace) made available by mother nature (Christ the Redeemer). According to the doctrine, genes are capable of explaining most of the differences; and it puts forth the scientific (Augustinian) arguments regarding the necessity of genes for any explanation of the differences, the infallible efficacy of genes, and demonstrates the absolutely arbitrary character of environmental explanations. Consistent with this pessimistic view of man's nature and freedom are its rigoristic views on scientific method and quantification.

The publication of the manifesto of Jensenism, "The g Factor", after attempts to censor it, aroused violent controversy. The work was accused, chiefly by Psychologists (Jesuits), of divesting freewill of all reality and of rejecting the universality of the redemption by environmental means. Nevertheless, the Jensenist interpretation of the empirical evidence spread. It was defended by many disciples and it attracted many influential converts.

The establishment, in the pages of the New York Times (Papacy), struck out against Jensenism with the publication of a devastating review of "The g Factor" (the Bull of Cum Occasione) which among other things condemned the five propositions of Jensenism on the relationship between black-white differences in IQ and genes.

Jensenism is a complex movement, based more on a commitment to scientific method (a certain mentality and spirituality) than on specific doctrines. It is an attempt, in line with that of the Reformers, to reform psychology (the Church) in the spirit of early science (Christianity). It opposed what, in its view, was a compromising approach to true scientific method (Christian theology) and practice but was rejected by psychology (the Church) as an exaggerated and unorthodox position.

Costs and Benefits of Defying the Crowd in Science by ROBERT J. STERNBERG, Yale University

Scientists, mirroring the societies in which they live, have devised numerous ways of rewarding conformity and punishing defiance. Some of the mechanisms are reviewed. Scientists who defy the crowd can gain extrinsic reinforcement, but often from sources that promote irresponsibility on the part of these scientists. For the most part, Arthur Jensen has spent his career in defiance of the scientific crowd. Some of this work has made an outstanding contribution to the science of intelligence: other work, I believe, has been regressive. What kind of system might appropriately reward that work which has made a contribution?

On November 27, 1997, the day of the Macy's Thanksgiving Day parade, my wife and I were in New York City. We had no interest in the Thanksgiving Day parade and were walking down Seventh Avenue when we started encountering noticeable pedestrian traffic walking in the opposed (northward) direction. The farther we walked, the heavier the opposing pedestrian traffic became, and the more visibly annoyed people became that we were walking in the opposite direction. Eventually, we reached a density of human traffic such as we had never seen before. The choice of whether to walk in the direction opposed to everyone else was taken away from us: Police waved us over onto a side street to head toward the east. We could either join the crowd or leave it altogether. We were forbidden to oppose it.

Throughout much of history and much of the world even today, people have had the same choice with respect to their ideas. They have had the option either to join the crowd or, if they are lucky, to leave it, but not to oppose it. Through secret police, inquisitions, kangaroo courts, and even summary execution, people who have chosen either not to be part of the parade or at least to be fellow-travelers with it have been subjected to punishment. Of course, people in the United States like to believe that it is different there. After all, many of those living in the U.S. believe it

to be a "free country."

On the one hand, the freedoms enjoyed by residents of the U.S. are substantial. For example, people can criticize the government or even sue its chief executive, both without being imprisoned or otherwise totally silenced. At the same time, the society has been able to function without a formal government-sponsored "thought police" in part because the members of the society have themselves taken on aspects of the role of a thought police, obviating the need for a formal squadron. The society has devised many ways to punish nonconformers, as any child in a schoolyard has observed. Of course, at other times in the country's history -- most notoriously but not only during the McCarthy era -- nonconformers in the U.S. have not been so lucky. Those who have defied the crowd have been vilified or even perished. Scientists are not much different from other people. Scientists, too, have developed a number of ways to ensure that their numbers follow the crowd.

ENFORCING CONFORMITY TO THE CROWD AMONG SCIENTISTS

Thought policing is not limited to politics. It occurs in science as well. Many individuals enter science because they believe it is a calling that encourages free thinking and independent thought. Many of these same individuals soon discover that their idealism bears little contact with reality. As Kuhn (1970) and others have observed, scientists are no more independent-minded or free-thinking than anyone else. If anything, they cherish conformity more than the rest.

Scientists enforce conformity in a number of ways, both formal and informal.

1. Training. For the most part, students learn through their preprofessional training what the current paradigms are and what kinds of work are rewarded and what kinds are not. They are encouraged to do kinds of work that will be rewarded. To a large extent, training is considered "good" to the extent that it teaches students where the rewards are.

2. Publications. Many people who have submitted articles to journals have discovered that the refereeing process is an excellent way to ensure conformity under the banner of quality control. Of course, it is difficult to get articles accepted if they are totally pedestrian; but there is almost always some journal that will take an article, no matter how pedestrian it may be. More difficult is to get articles accepted if they go against the accepted wisdom, as John Garcia discovered in his studies of conditioning and as many others have discovered in their own work. Thus, many people find that the work that is hardest to get accepted is not only their worst work, but also their best.

3. Grants. Grants provide an excellent way to reward conformity. People who work outside established paradigms often find it very difficult or impossible to get funded, so that they are effectively prevented from doing much of what they might have intended to get done. There are

many forces that contribute to making granting agencies a conservative force (see Sternberg, 1996a, 1997). First, low selection ratios allow even one negative reviewer essentially to blackball a proposal. Second, programmatic agencies fund work within their established program of research but not outside it. Third, people who are asked to serve on review panels will, for the most part, be those working within established and accepted paradigms. Fourth, those who agree to spend the vast amounts of time it requires to be on such panels may tend even more toward conformity than those who would rather devote the time to their own research. Finally, proposals are expected to make contact with existing paradigms, and if they do not, they can be rejected for this reason alone.

4. Recognitions. Through prizes, awards, organizational offices, and the like, scientists can enforce their set of values, recognizing those who play the accepted game well and failing to recognize those who go outside the accepted limits. In some cases, these views may even have nothing to do with the work for which recognition is being given. For example, a lifetime achievement award to be presented to Raymond Cattell at the annual meeting of the American Psychological Association in 1997 was suspended pending investigation of his religious beliefs!

5. Book Reviews. Books of scholars who go beyond the limits are typically subject to negative reviews, sometimes by people who seem not to have read the books.

6. Graduate Students. "Respectable" researchers do not send their undergraduate students to work with "disreputable" researchers.

7. Informal Networks. Perhaps most importantly, those who work outside accepted networks never make it into the professional in-groups. They are less likely to be asked to serve on committees, write promotion letters, give invited talks at major scientific conferences, give departmental colloquia, and the like.

In sum, the various fields of science construct a system for enforcing conformity. Scientists who do not conform are "out." But other mechanisms come into play that not only reward scientists for divergent views, but actually encourage the scientists to diverge even more, even to the point of irresponsibility.

ENCOURAGING NONCONFORMITY TO THE CROWD AMONG SCIENTISTS

If scientists received no rewards at all for nonconformity, they might cease to be nonconformists. But there are at least three major sources of rewards for nonconformists.

1. Internal Rewards. Scientists who state what they believe and then fight for their beliefs have the satisfaction of knowing that they are saying and doing what they believe in. They can also hope that, in the long term, the scientific establishment will come around to their way of thinking and reward what they are doing. In fact, such changes are not unusual. In their writings, both

Sandra Scarr and Robert Plomin have commented on how behavior-genetic work that was devalued in the 1970s came to be valued by the latter half of the 1990s.

2. Fringe Groups. Fringe groups of scientists may set up their own organizations to reward what they are doing, or may find that their work is ideologically consistent with the priorities of political or social fringe groups and thus accepted and even welcomed by such groups. Such scientists may therefore find themselves having to decide whether to associate with these groups in order to feel extrinsically rewarded. But these groups may in turn encourage the scientists to take positions even more extreme than those they believe in, and perhaps to take positions that are irresponsible.

3. The Media. By far the most powerful ally of the nonconforming scientist in this country can end up being the media. The media thrive on controversy and on the offbeat. Thus if virtually all scientists believe that AIDS is caused by the human immunodeficiency virus (HIV) and a few scientists do not believe this to be the case, the disbelievers may find themselves actually getting more media attention because of the divergence of their views. If most people believe that racial differences in psychometrically measured intelligence are largely environmental and a few scientists believe (or are willing publicly to state) that such differences are probably largely genetic, the views of the minority are likely to attract attention. Moreover, even if most of these scientists' views are conventional, it is the unconventional part of their views that is likely to attract the media attention.

The situation can become pernicious because media attention tends to be short-lived. Unfortunately, almost the only way for nonmainstream scientists to maintain media attention and the extrinsic reinforcement it brings is either to take new unconventional positions, or to become more extreme in the positions they already have taken. Many of us scientists who have worked with the media have found reporters trying to get us to make statements more extreme than we really believe, simply because such statements make for more interesting press coverage. The reinforcement system thus can turn a nonconforming but responsible scientist into a less responsible or even an irresponsible one. Worse, it may be only through the media that one can gain any coverage of one's divergent views. Iced out of mainstream science, scientists with nonconforming views may thus turn to the media to get press coverage of their views, not fully realizing the dangerous game into which they are entering. Of course, the press coverage further "turns off" the so-called respectable scientists, so that what formerly might have been a bad situation with regard to the scientist's participation in mainstream science becomes an even worse one.

THE ROLE OF DEFIANCE OF THE CROWD IN SCIENCE

Defiance of the crowd in a Thanksgiving parade is rather innocuous. In science, defiance of the crowd has higher stakes. Elsewhere, Todd Lubart and I have proposed that defiance of the crowd is the hallmark of creativity (Sternberg & Lubart, 1991, 1995). Individuals in science or any

other field who make the most difference are those who defy the crowd. These individuals generate ideas that, like stocks with low price-earnings (PE) ratios, seem unattractive and even repugnant to others. The individuals work to raise the value of their metaphorical stocks, attempting to convince other people of the value of their ideas. Ultimately, they metaphorically "sell high," moving on to their next unpopular idea.

In our work, we give numerous examples of how initial receptions to creative ideas are often unfavorable and even patently hostile (Sternberg & Lubart, 1995). Scientists have developed a number of ways to ensure that scientists follow the crowd.

What's the problem, then? Why not just institute some kind of guarantee that scientists who defy the crowd will be rewarded rather than punished? The problem stems from the fact that creativity is typically defined not only in terms of novelty, but also in terms of quality and appropriateness. In terms of the stock-market analogy, one needs to remember that many and probably most low P-E stocks never do rise much in value. Consider the example of HIV and AIDS.

The scientist who denies that the human immunodeficiency virus causes AIDS takes a large risk. He will be disparaged by other scientists for defying the crowd. But if he can show to their satisfaction or that of others who hold power in the society that he is correct, then he may actually end up being a hero. In the case of the HIV opposition, no such demonstration has emerged. Nor has any credible science emerged from the efforts of proponents of cold fusion. In both cases, novelty without perceived quality has led proponents of offbeat views to be labeled not as creative, but rather, as crackpots. Creative people, of course, are risk-takers, but they tend to be sensible risk-takers (Sternberg & Lubart, 1995). They are willing to take risks that, in the long run, are more likely to pay off. The risks taken by proponents of the theory that HIV does not cause AIDS and of the theory of cold fusion have, to date at least, failed.

THE CASE OF ARTHUR JENSEN

Where does Arthur Jensen fit into the schema that has been set up in this article? First, most of Jensen's career has been outside mainstream science. Since his article almost 30 years ago in the Harvard Educational Review (Jensen, 1969), Jensen has been viewed by many as outside mainstream science. This fact is ironic, because the overwhelming majority of his articles and books have been within mainstream science. Jensen's work on reaction time and intelligence (e.g., Jensen, 1982) is solidly within the information-processing tradition. Jensen's work on test bias (Jensen, 1980) is solidly within the psychometric tradition, as is his work on the g factor (Jensen, 1998). Thus, what constitutes a relatively small proportion of his work has, for the majority of the scientific community, defined him. As noted in an invitation letter to this symposium that "he has received very little official recognition for his work and probably will not in the future" (Detterman, 1997), Jensen's defiance of the scientific crowd has cost him. Awards and recognitions that he otherwise might have received for influential, highly cited work

may never come.

Second, Jensen has been courted both by political fringe groups and by the press. Not despite but rather because of the unpopularity of his views, Jensen has been a media figure to an extent that is rare in mainstream psychology. Few psychologists are as well known, and some who perhaps are, such as the late Richard Herrnstein, are known for much the same reason -- not for their mainstream work (in Herrnstein's case, on animal learning), but for their work on race, heritability, and intelligence.

Scientifically, I disagree with most of the corpus of Jensen's work for reasons that are not relevant to this article but are discussed elsewhere (e.g., Sternberg, 1985, 1996b). But in terms of the criteria by which I believe scientific work should be judged -- such as creativity, basis in theory, empirical rigor, and impact -- I believe that most of Jensen's work fares well. The corpus of Jensen's psychometric work on the general factor and of his information-processing work on reaction time -- but not of his behavior genetic work, including work on racial differences.-- place him as one of the outstanding leaders in the field of human intelligence. Indeed, few people now alive have had more impact on the field, for better or worse. And few people studying human intelligence have more scientific investigations to their credit. Indeed, much of the highly cited work in the field of intelligence has little or, arguably, no scientific basis at all.

I exclude from this accolade Jensen's work on behavior genetics and racial differences in intelligence because, for a number of reasons discussed elsewhere (e.g., Sternberg, 1996b), I believe this work to be not only wrong, but wrong-headed. My goal here, though, is not to discuss substantive differences, but rather, how a field should evaluate scientific work that defies the crowd.

Arthur Jensen is, in my opinion, an epitome of the need to change the reward system in science. Suppose, for the sake of argument, that many other scientists believed as I do that Jensen's work on information processing and on psychometrics has been ground-breaking but his work on behavior genetics has not been, or even has been regressive. How does the reward system function?

Much of the way the academic reward system functions -- not just in science -- is by the reputation of the academic (Caplow & McGee, 1958). When reputation is viewed unidimensionally or almost unidimensionally, the field may find itself forced into judgments it should not make. If one body of work within a corpus is disfavored, scientists may end up generalizing this disfavor unfairly to other work by the same investigator.

At times, some kind of combination formula with regard to the bases of evaluation is inevitable. For example, when a department has just one available slot for a job and someone must be hired, a hard choice must be made despite the fact that an idiographic model of evaluating candidates might seem much more appropriate than a nomothetic model. But many decisions need not be

unidimensional.

Many and probably most major scientific awards are to individuals for the cumulative corpus of their work. As a result, a scientist who has done even one stream of unpopular work may find him or herself iced out of the awards system because this work damages -- rightfully or wrongfully -- the valuation given to the overall corpus or work. Perhaps a better way to grant recognition would be to a program of work, with the individual rather than the work being seen as incidental. Thus, instead of giving an award to Scientist X for Research Program A, the award would be given to Research Program A -- not necessarily the whole corpus of a scientist's work -- with the scientist receiving the award incidentally. The focus would be on the work, not on the scientist. In the case of Jensen, one could recognize the value of his work on reaction time or the general factor without recognizing the value of other work. In the case of Cattell, one would reward the work, say, on the theory of fluid and crystallized intelligence or on the 16-personality factor theory irrespective of what Cattell's personal beliefs might be.

In some cases, judgments of work are being influenced not by portions of the person's work, but by judgments of the person's character with respect to things that arguably have nothing to do with the work. Cattell's religion is a case in point. A more extreme example is Paul DeMan. The work of Paul DeMan, in particular, and deconstructionism in general, are undergoing a thorough reexamination in light of fairly recent discoveries that DeMan wrote virulently anti-Semitic tracts in his youth. Such tracts certainly may and probably must greatly damage our evaluation of DeMan as a person. But Richard Wagner the composer and Ezra Pound the poet were also virulent anti-Semites. Their work stands as it was, regardless of how personally despicable either or both of them likely may have been. It would probably be a loss to the world if Wagner's and Pound's works were ignored because of their despicable personal views or because of their deeply flawed personal characteristics.

If we are to believe Gardner (1993), many creative individuals have had much less than savory personal characteristics. There is good reason to judge people and their work separately, and then to judge people's distinct programs of work separately. Indeed, almost every creative individual has produced work of which he or she is, at best, not proud, and at worst, ashamed (or should be).

CONCLUSION

Science has a number of ways of enforcing adherence to the dictates of the crowd. Scientists who choose to defy the crowd can still gain reinforcement, but when it comes from others, it is often in the form of temptations that can lead the scientist down a path to irresponsibility. Scientists would do better if they focused their evaluations not on individuals, but on programs of work within the total corpus of the scientists' work. In this way, people whose work is viewed as undesirable in some ways are not punished so that neither they nor other work they may do is taken seriously.

In the case of Arthur Jensen, I believe that a large body of his work is deserving of great commendation (although I disagree with most of it). I hope it is for his work on information processing and the general factor that he is remembered, not for his work on behavior genetics, test bias, or racial differences in intelligence and related traits.

If there is anything for which citizens of a country should give thanks on Thanksgiving Day, it is not that they can join a parade, but that they can choose to walk, at the very least, away from it, and at best, in opposition to it.

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The "Jensen Effect" and the "Spearman-Jensen Hypothesis" of Black-White IQ Differences by J. PHILIPPE RUSHTON, University of Western Ontario

Arthur Jensen's research on the biological basis of mental ability has culminated in his encyclopedic new work *The g Factor* (1998) which massively confirms "Spearman's (1927) hypothesis" that Black-White IQ differences vary systematically as a function of each test's g loading. More generally, *The g Factor* consolidates the psychometric, neurophysiological, behavior genetic, and comparative evidence for the existence and importance of g and links it to evolutionary processes. But perhaps Jensen's greatest legacy to science will be his pioneering method of correlated vectors which subsumes, under a much broader principle, his famous (1969a) hypothesis about the heritability of the Black-White IQ gap and, as Osborne (1980) dubbed it, the "Spearman-Jensen hypothesis" that Black-White IQ differences are greatest on the g-factor. Jensen's method of correlated vectors demonstrates that g (specifically a test's g loading) is the best predictor of that test's correlation with a given variable, in future, when a significant correlation occurs between g-factor loadings and variable X, the result might usefully be called a "Jensen Effect" (for that X variable). because otherwise there is no name for it, only a long explanation of how the effect was achieved. Naming it the "Jensen Effect" would honor one of the greatest psychologists of our time.

A Personal Note

Perhaps I am the only psychologist of my generation who missed the tumultuous appearance of Arthur Jensen's (1969a) famous Harvard Educational Review article arguing that IQ is heritable and that genetic factors are involved in the Black-White IQ gap. The attendant brouhaha failed to

reach my attention in England where I was an undergraduate student at the University of London. Two years later, however, when Hans Eysenck popularized Jensen's argument in his 1971 book *Race, Intelligence, and Education*, I was a graduate student at the London School of Economics and Political Science, and Eysenck's book created such a furor that a small group of us social psychologists decided to study the issue. Jensen's clearly argued response to seven "replies," as well as his original exposition (all usefully compiled in an offprint series by the Harvard University Press) led some of us to believe that he might well be right.

Jensenism, described as one of the great heresies of 20th century science, continued to inspire heated debate at the London School of Economics for the next two years, culminating in a physical assault on Professor Eysenck when he came to give us a lecture in 1973 on "The Biological Basis of Intelligence." I was more than just a horrified witness to this 'political action' by a dozen Maoists (proudly sporting red Mao-Tse Tung badges in their lapels). I was even featured in a newspaper photograph in a scrum around Eysenck, energetically pulling at rampaging 'demonstrators,' but wearing the fashionably long hair of the time, it might not be obvious from the photograph whose side I was on! The Maoists made no attempt to hide after Eysenck was hustled away, for the police were not to be called and there was an unfortunate sentiment that Eysenck only got what he deserved. "No Enemies on the Left" was a mantra at the L.S.E. in the early 1970s.

The first time I heard Jensen speak in person was at the 1978 annual meeting of the American Psychological Association in Toronto where he (1979) presented "g: Outmoded Theory or Unconquered Frontier?" The science was inspirational, all about reaction-time and speed-of-processing correlates of IQ. The large ballroom was filled to overflow and the audience, rapt with attention, burst into enthusiastic applause when he had finished. If only in contrast to anxious expectations, the 'infamous Dr. Jensen' struck me as warm, humane, and giving of one of the most exciting talks I had ever heard.

I eventually met Jensen in early 1981 while spending a term as a Visiting Scholar at Berkeley's Institute of Human Development. Having just written a book explaining altruism from a social learning perspective (Rushton, 1980), I was broadening my focus to encompass behavioral genetic and sociobiological viewpoints. Although many of those at the Institute of Human Development had earned international reputations for documenting the early emergence of personality traits and their power to predict social adjustment, few were interested in searching for behavior genetic causes. The reason was not hard to find. At Berkeley, any discussi> -----

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ervous hop, skip, and a jump away from Jensen's controversial racial hypothesis.

Jensen occupied an office in the School of Education, one floor up from my office in the

psychology department. We easily established rapport. The question of race differences was beginning to fascinate me and on this topic, of course, Jensen was most informative. Over several lunches at Pasand, one of his favorite local Indian restaurants, he sketched out his views and helpfully answered queries. Back at his office he provided reprints. It was clear that Jensen's defining trait was intellectual curiosity and for him the study of race differences presented an acid test. How could the topic, which loomed so large in education and society, be avoided for ideological reasons if psychology was to be scientific and if the individual scientist was to maintain personal integrity? I came away profoundly influenced and determined to read the relevant literature.

International Distribution of IQ, Brain Size, and Related, Traits

Many researchers were inspired by "Jensenism." Lynn (1978, 1982) and Vernon (1982) not only pushed the envelope, but extended the 'outside of the envelope' and made the race-IQ debate international in scope with their findings that East Asians average higher on tests of mental ability than do Whites, whereas Caribbeans (and especially Africans) average lower. As Lynn's (1997) and Jensen's (1998) most recent reviews show, East Asians, measured in North America and in Pacific Rim countries, typically average IQs in the range of 101 to 111. Caucasoid populations in North America, Europe, and Australasia typically average IQs from 85 to 115 with an overall mean of 100. African populations living south of the Sahara, in North America, in the Caribbean, and in Britain typically have mean IQs from 70 to 90. (Blacks in sub-Saharan Africa score about 2 standard deviations [approximately 30 IQ points] below the mean of Whites on nonverbal tests.)

As a budding sociobiologist, I too was inspired by Jensenism. It seemed to me that by its impact on diverse areas of behavioral science, Jensenism might help complete the Darwinian revolution. I began to review the international literature, studying not only IQ, but other behavioral traits like speed of physical maturation and longevity, personality and temperament, family structure and crime, and sexual behavior and fertility, and later brain size (Rushton, 1984a, 1984b, 1988). I have found that on these traits East Asians are slower maturing, less fertile, less sexually active, with larger brains and higher IQ scores than Africans, who tend towards the opposite in each of these areas. Europeans, I found, fell between the other two groups. As Jensen (1984) elaborated (in a commentary on my first review), a network of such related evidence provides more opportunity for finding and testing alternative theories than does any single dimension drawn from the set.

As a now avowed Jensenist, I carried out experiments finding, for example, that the amount of inbreeding depression on 11 sub-tests of the Wechsler Intelligence Scale for Children in Japan predicted the magnitude of the Black-White differences on the same sub-tests in the U.S. (Rushton, 1989). Inbreeding depression, a purely genetic effect, was a sufficiently robust predictor to overcome generalization from the Japanese in Japan to Blacks and Whites in the U.S. There really is no other explanation, other than a genetic one, for the correlation between

inbreeding depression and Black-White differences.

I also calculated cranial capacities from external measurements of the head using large archival data sets including a stratified random sample of 6,325 U.S. Army personnel (Rushton, 1992), a sample of tens of thousands of men and women collected by the International Labour Office in Geneva (Rushton, 1994), and a sample of thousands of American children from birth to age seven (Rushton, 1997). After adjusting for the effects of stature, weight, and sex, the cranial capacities consistently averaged higher for East Asians than for Europeans, who averaged higher than Africans, as reviewed by Rushton and Ankney (1996) and Jensen (1998).

Jensen's The g Factor

All the issues Jensen raised in 1969 are still with us today. Indeed, much of the opposition to IQ testing and heritability would probably disappear if it were not for the stubborn and unwelcome fact that, despite extensive well-funded programs of intervention, the Black-White difference refuses to go quietly into the night.

Jensen's long intellectual march has culminated triumphantly in his latest book, *The g Factor* (1998), an exposition of the reality of Spearman's (1927) seminal concept of *g*, the general factor of intelligence. Jensen's tome does not draw back from Jensenist conclusions--that the average difference in IQ found between Blacks and Whites has a substantial hereditary component, that this difference is related mainly to the *g*-factor, and that it has important societal consequences.

Chapter 11 of *The g Factor* fully documents how, on average, the American Black population scores below the White population by about 1.2 standard deviations, equivalent to 18 IQ points. This mean difference between Blacks and Whites in IQ scores has scarcely changed over the past 80 years (despite some claims that the gap is narrowing) and can be observed as early as three years of age. Controlling for overall socioeconomic level only reduces the mean difference by 4 IQ points. Contrary to purely cultural explanations, culture-fair tests tend to give Blacks slightly lower scores, on the average, than more conventional tests, as do non-verbal tests compared with verbal tests, and abstract reasoning tests compared with tests of acquired knowledge.

The reason, in fact, that Jensen pursued Spearman's hypothesis is that it so exquisitely solved a problem that had long perplexed him about test bias with respect to Black-White differences. He had noted that the Black-White differences are markedly smaller on tests of rote learning and short term memory than on tests of reasoning and those requiring any transformation of the information. He initially formalized these observations in his so-called Level I-Level II theory (Jensen, 1968). Level I tasks were those that required little or no mental manipulation of the input to arrive at the correct output. A clear example of Level I ability is Forward Digit Span in which people recall a series of digits in the same order as that in which they are presented. Level II tasks, however, require some mental manipulation of the input in order to arrive at the

appropriate response. A clear example of Level II ability is Backward Digit Span in which people recall a series of digits in the reverse order to that in which they are presented. Jensen found that Black-White differences are twice as large for Backward as for Forward Digit Span. As this finding did not readily lend itself to an explanation in terms of cultural bias or in terms of any other theory Jensen knew of except his Level I-Level II notion, he kept thinking about it.

After Jensen re-read Spearman, he realized that his Level I-Level II formulation was only a special case of the more general hypothesis proposed by Spearman. Jensen began testing Spearman's hypothesis on a wide variety of psychometric tests administered to large representative samples of the American White and Black populations (Jensen, 1985, 1987). The g Factor summarizes the results from 17 independent data sets on a total of nearly 45,000 Blacks and 245,000 Whites derived from 171 psychometric tests. g loadings consistently predict the magnitude of the Black-White difference ($r = +.63$). Spearman's hypothesis is borne out even among three-year-olds administered eight sub-tests of the Stanford-Binet. The rank correlation between g loadings and the Black-White differences is $+.71$ ($p < .05$).

Spearman's hypothesis applies even to the g factor extracted from performance on elementary cognitive tasks. In some of these studies, 9-to-12-year-olds are asked to decide which of several lights is illuminated and move their hand to press a button that turns that light off. All children can perform such tasks in less than one second, but children with higher IQ scores perform faster than do those with lower scores, and White children, on average, perform faster than Black children (Vernon & Jensen, 1984). The correlations between the g loadings of these types of reaction time tasks and the Black-White differences range from $+.70$ to $+.81$.

Jensen also applied Spearman's hypothesis to East Asian-White comparisons, using the same reaction time measures. The direction of the correlation is opposite to that in the Black-White studies, indicating that, on average, East Asians score higher in g than do whites. No one so far seems to have looked at East Asian-White differences on conventional psychometric tests as a function of their g loadings. From the study just mentioned, however, Jensen's prediction should be clear: One should find the mirror image of Spearman's hypothesis for Black-White differences. It might be interesting to note, in light of the above, that in an early reply to a charge of "white supremacy," Jensen (1969b, p. 240) made a remarkably presaging conjecture. He wrote: ". . .if I were asked to hypothesize about race differences in what we call g or abstract reasoning ability, I should be inclined to rate Caucasians on the whole somewhat below Orientals, at least in the United States."

The Spearman-Jensen Hypothesis

Osborne (1980) suggested that if scientific credit was to be assigned appropriately, the "Spearman hypothesis" that Black-White differences are greater on more g-loaded sub-tests should become the "Spearman-Jensen hypothesis" because it was Jensen who brought Spearman's hypothesis to widespread attention, and it was Jensen who did all the empirical work

confirming it. Jensen (1997) himself has noted that, "Because Spearman himself never presented it as a formal hypothesis, a few people have objected to my crediting it to Spearman. So whenever I say 'Spearman's hypothesis,' I hope you will visualize these words in quotation marks."

The Jensen Effect

The Spearman-Jensen hypothesis turns out to be readily subsumable under a more general principle that, when resulting in a positive finding, we might call a "Jensen Effect." Recall that the Spearman-Jensen hypothesis was tested by first extracting the g factor from a variety of cognitive tests, and then relating these scores (a 'vector' of scores, i.e., with direction as well as quantity), to the mean Black-White differences on those same tests (a second 'vector' of scores). Jensen extended this method of correlated vectors to a variety of variables. Using this procedure, Jensen (1998) showed that the vector of a test's g loadings is the best predictor of that test's correlation with a variety of variables, including not only scholastic and work-place performance, but also brain size, brain pH, brain glucose metabolic rate, average evoked potential, reaction time, and other physiological factors. The Jensen Effect can be seen whenever there is a significant correlation between the vector of the sub-tests' g loadings and the vector of the same sub-tests' loadings on variable X (where X is some other, usually non-psychometric variable).

This methodological innovation of Jensen's may be an even greater discovery than the totality of empirical results generated by it, important though these undoubtedly are. His method of correlated vectors is fully explicated in *The g Factor* (Appendix B) and is also discussed in the opening remarks of this symposium. To honor Jensen's accomplishments into the future, I propose that when a significant correlation occurs between the two vectors the result be called a Jensen Effect (for that X variable), because otherwise there is no name for it, only a long explanation of how the effect was achieved.

Chapter 12 of *The g Factor* presents Jensen's technical arguments for why he believes that race differences are about 50% genetic in origin. He emphasizes the fact that it is precisely those components of intelligence tests that are most heritable and that most relate to brain size which most profoundly differentiate Black from White groups. The heritability data are especially interesting because genetic theory and culture theories of race differences make predictions opposite to each other. Culture theory predicts that differences between races will be greater on those culturally malleable items on which races can grow apart as a result of dissimilar experiences.

The g Factor also cites the evidence of transracial adoption studies. Three studies have been carried out on Korean and Vietnamese children adopted into White American and White Belgian homes. Though many had been hospitalized for malnutrition, prior to adoption, they went on to develop IQs ten or more points higher than their adoptive national norms. By contrast, Black and

mixed-race (Black-White) children adopted into White middle-class families typically perform at a lower level than similarly adopted white children. In the well known Minnesota Transracial Adoption Study, by age 17, adopted children with two White biological parents had an average IQ of 106, adopted children with one Black and one white biological parent averaged an IQ of 99, and adopted children with two Black biological parents had an average IQ of 89 (which is not different from that of Black children raised by Black parents in these northwestern states).

The g Factor also devotes a fair amount of space to racial differences in brain size. Chapter 6 reviews the literature which shows that the brain-size IQ relation emerges most clearly using Magnetic Resonance Imaging ($r = .44$ across eight separate studies). Chapter 12 documents the three-way racial gradient in brain size established by aggregating data from studies using four kinds of measurements: (a) wet brain weight at autopsy, (b) volume of empty skulls using filler, (c) volume estimated from external head sizes, and (d) volume estimated from external head measurements and corrected for body size. East Asians and their descendants average about 17 cm³ (1 in³) larger brain volumes than do Europeans and their descendants, whose brains average about 80 cm³ (5 in³) larger than do those of Africans and their descendants. Jensen (1998, pp. 442-443) calculated an "ecological" correlation (used in epidemiological studies) of +0.998 between median IQ and mean cranial capacity across the three populations of "Mongoloids," "Caucasoids," and "Negroids."

Finally, The g Factor considers the race differences from an evolutionary perspective. Jensen accepts the "Out-of-Africa" theory, that Homo sapiens arose in Africa about 100,000 years ago, expanded beyond Africa after that, and then migrated east after a European/East Asian split about 40,000 years ago. Since evolutionary selection pressures were different in the hot savanna where Africans evolved than in the cold Arctic where Mongoloids evolved, these ecological differences had not only morphological, but also behavioral effects. The farther north the populations migrated 'Out of Africa,' the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children during prolonged winters. As these populations evolved into present-day Europeans and East Asians, they underwent selective pressure for larger brains.

The g Factor's strong conclusion about race differences in fact came as something of a surprise to me. In all my discussions with Jensen about race differences since 1981, I had been struck by his careful circumspection. More than once he went so far as to say that he doubted that methods were available for determining whether Black-White differences were heritable (including the methods of behavior genetics). As best I recall, he said something like: "We can never 'prove' for certain that the race differences in IQ are heritable in the sense that we can 'prove' something in mathematics. All empirical science can do is increase the probability that genetic factors are involved."

Pushing Out the Envelope Even Further

Science is a never ending journey and Jensenism has traveled far since 1969. With regard to the significance of brain size, for example, early on, Jensen described brain size as unrelated to IQ (1969a, p. 73; 1973, p. 333, 349), and did not cite the literature on racial differences in brain size. Somewhat later, in *Bias in Mental Testing* (1980), he cited Van Valen's (1974) re-assessment of the literature showing a $+0.30$ correlation between brain size and IQ along with a Table from Hooton (1939) showing a linear relation between head size and socioeconomic status. By 1984, Jensen cited Ho, Roessmann, Straumfjord, and Monroe's (1980) autopsy studies showing a Black-White brain weight difference of about 100 grams and outlined a variety of ways to examine relations between race, brain-size, and IQ. By the time of *The g Factor*, Jensen's own studies had shown that head size was related to IQ even within-families, that the head size/IQ relationship occurred on the most g-loaded tests, that Blacks and Whites differed in head size, and that the Black and White differences in head size disappeared when Blacks and Whites were matched for IQ.

The conclusion that there are racial differences in average brain size is becoming accepted. For example, Ulric Neisser, Chair of the recent American Psychological Association's Task Force Report on *The Bell Curve* (Neisser et al., 1996) acknowledged that, with respect to "racial differences in the mean measured sizes of skulls and brains (with East Asians having the largest, followed by Whites and then Blacks). . . there is indeed a small overall trend" (Neisser, 1997, p. 80).

From the beginning, Jensenism did not stop with IQ. For example, Jensen (1969a, p. 86) cited studies showing the early development of motor behavior in Black infants with some Black samples at six months of age scoring nearly one standard deviation above White norms. Paralleling the behavioral precocity, Jensen (1969a, p. 87) reported evidence of faster bone development in Black infants (established using X-rays) and earlier maturation of brain wave patterns (measured using EEGs). Soon after, Jensen (1973: 289-290) suggested that race differences in the production of two-egg twins, being most common among Blacks and least common among East Asians, with Caucasians intermediate, "may be a reflection of evolutionary age." In a long footnote, he wrote: "[T]he three racial groups lie on a developmental continuum on which the Caucasian group is more or less intermediate. A related fact is that there is an inverse relationship throughout the phylogenetic hierarchy between the tendency for multiple births and the prolongation of immaturity."

As a committed Jensenist, I pursued these hypotheses with vigor and proposed a gene based "life-history theory" familiar to evolutionary biologists as the r-K scale of reproductive strategy to account for the racial trade-off between brain size and egg-production, and other variables (Rushton, 1995). At one end of this scale r-strategies emphasize high reproductive rates while at the other K-strategies emphasize high levels of parental investment. This scale is generally used to compare the life histories of widely disparate species, but I used it to describe the immensely smaller variations within the human species. Following Jensen's trail I went on to hypothesize that Mongoloid people are, on average, more K-selected than Caucasoids, who in turn are more

K-selected than Negroids. My book *Race, Evolution, and Behavior* documents the reality of racial differences in over 60 physical and behavioral traits.

Conclusion

In recent years, the equalitarian dogma has run headlong into some very bad karma. In the wake of the success of *The Bell Curve* (Herrnstein & Murray, 1994), and other recent books that provide race-realist answers to the question of differential group achievement, there has been an intense effort to get the 'race genie' that Jensen's 1969 Harvard Educational Review paper loosed safely back in the bottle, to squeeze the previously tabooed toothpaste back in the tube. By firmly establishing the psychometric, neurophysiological, behavior genetic, and comparative evidence for the existence and importance of Spearman's g , Jensen's *The g Factor* makes it near certain that such obscurantist efforts will end up shredded by Occam's razor.

On Arthur Jensen's Integrity by SANDRA SCARR, University of Virginia, emerita

Few psychologists have engendered the controversy or endured the abuse that Arthur Jensen has in the past three decades. His adamant adherence to a hard-edged science and an uncompromising personal integrity have led to notoriety. Although these virtues might be rewarded, if applied to less controversial topics. Art Jensen has been vilified because he applied his standards to the most important and painful social issues of our day. In this article, I admire his ethics but trace the negative reactions he evoked. His legacy to psychological science goes beyond important studies on choice reaction times and intelligence, environmental effects on intelligence, and race differences in mental development: Art Jensen set a standard for an honest psychological science.

For more than 40 years, Arthur Jensen has unflinchingly strived to make psychology an honest science. My emphasis is on both words, honest, and science. For this alone, I would admire him enormously, but there is much more to admire about Art's lifework, which continues unabated by his official retirement. Besides his intellectual mentor, Robert Thorndike, and a few other pillars, such as Lee Cronbach, Robert Woodworth, and Lewis Terman, Arthur Jensen's contributions tower above educational psychology and psychometrics.

The Scientist

As his own essay (this issue) demonstrates, Art relentlessly pursues a hard-edged, hypothetic-deductive science that treads on a more emotional, humanistic psychology. Art has no sympathy for mushy thinking. For him, impressions and feelings are not data and have no place in psychology, beyond perhaps the hypothesis-formation stage. Art is ruthlessly scientific: If hypotheses derived from a theory cannot be tested by logical experimentation and data analysis,

the theory does not deserve to be called psychological science.

Art rejects convenient compromises and politically expedient obfuscation. These virtues have not been universally appreciated. I have never known him to evade a controversy or mollify an opponent, when the intellectual stakes are high. Outspoken and bloodlessly calm in the face of threats, Art confronts the most emotional critics with logical argument and polite disdain. He remains agnostic where data do not drive him to a conclusion, and his agnosticism on matters of test bias, IQ testing, and racial differences in "g" has cost him dearly. Even with his back to the wall, he continues to proclaim the facts, as he sees them.

He exposes intellectual dishonesty in whomever he finds it, and there is plenty of intellectual dishonesty to find among our Politically Correct colleagues. Art is an important player in battles against the kind of naive environmentalism that has squashed constructive, scientific contributions from psychologists to the most important educational issues of our time, from Head Start to special education to university entrance requirements. Although we are both infamous for exposing naked Emperors, I may be just a tiny bit more tolerant of the bleeding-hearts among us -- a weakness that has saved me from much of the abuse he has suffered.

Research Contributions

Art's own studies of learning processes and "g" unwaveringly follow models derived from physical sciences. Psychological science consists of rigorous experiments, psychometrically credible tests, and sophisticated data analyses. He is an unapologetic reductionist, who believes that complex processes will always be explainable in simpler, component terms.

For Art, mind is no more than brain chemistry. In this belief, he clearly rejects systems theories and cognitive theories of mind, in favor of mechanistic, physical models. For those who believe that the whole may be more than the sum of its component parts, especially in biological systems, and that experience is constructed by minds, Art's strict adherence to physical science model may seem anachronistic.

Determined and persistent, Art followed several lines of research on learning and intelligence. To my mind, his three most important research contributions are:

- 1.The elegant series of studies on reaction times in complex, choice tasks;
- 2.His studies of older and younger siblings in California and Georgia to test competing genetic and environmental hypotheses about racial differences in IQ; and
- 3.The clever construct validity studies, matching the performance of younger White children to that of older Black children on tasks where Black-White difference are most prominent.

In the series of studies on reaction times, he showed that brain functions -- speed, reliability, and capacity -- can be measured in seemingly simple reaction time tasks that are importantly related to psychometric "g" and by extension to many forms of academic and other life achievements. Despite carping by critics from the narrow world of experimental psychology, Art showed real-life implications for laboratory tasks that heretofore had gone unnoticed, except among laboratory psychologists. (I was there in Britain where the mocking of some learning researchers was extremely distasteful to all but the nastiest high-table fools.) In characteristic fashion, Art ignored the ad hominem slurs and persisted to show how important their seemingly trivial tasks really were. Art succeeded in giving psychometric "g" some important physical correlates (he might say physical bases, but I won't go that far). That line of research has many more miles to go.

Closer to my interests, in the second example, Art saw an opportunity for a naturally occurring experiment -- the comparison of older and younger siblings, as a test of competing theories about the origins of racial differences in IQ. He reasoned logically (as always) that if environmental deprivations were responsible for lower test scores of Blacks, then the longer children were exposed to such environments, the more they would lag behind test norms; that is, the lower their IQ scores would become. Older siblings have longer exposure to such deprivations; hence, they ought to score lower on IQ and standardized achievement test than their younger sibs. If, on the other hand, genetic differences were primarily responsible for Black-White differences, then no older-younger sibling differences should be observed. Among Berkeley, CA school children, no older-younger sibling differences on tests were observed. In poverty-stricken, rural Georgia, however, the environmentally predicted declines in test scores were found.

More developmental psychologists are embarrassingly glib on racial differences; Any observed Black-White difference must be due to "racism," social disadvantage, and other neighborhood and school features, because they correlate with IQ. By using sibling comparisons, Art showed that such excuses (I refuse to call them explanations) were not true in Berkeley, where exposure to the mainstream culture is extensive for even the poorest minority children, whereas in rural Georgia, restriction of learning opportunities explained the sibling IQ differences. These studies showed that in really deprived rearing circumstances, even Art Jensen can find environmental effects! Kidding aside, these studies of sibling differences in IQ are all the more important because Art did them. One can only hope his critics will remember to attribute them to him.

The studies of sibling IQ differences in California and Georgia helped me to think about what kinds of environments have negative effects on intellectual development and which do not. Our own adoption studies found that children adopted in infancy into working class families achieved IQ levels as high as adoptees reared in privileged professional families, whereas biological offspring of such families differed by 10 IQ points, on average. Clearly, genes were the major cause of social class differences in IQ, not whether parents take their children to ball games or museums, or whether they listen to Country & Western tunes or to Mozart (take that, Art-the-music-snob). These results, and Art's sibling studies, led me to stand up for "good-

enough parents," who provide loving support and learning opportunities, but not necessarily those the intelligentsia value most. My proposal, that most parents are "good enough" at child rearing to support their children becoming the best they can be, provoked PC colleagues to attack me as anti-child welfare, because surely every child needs to have parents just like them to become the best (their self-serving snobbery is appalling and unrecognized).

Since our working class Midwesterners were doing as good a job with their adopted children as their highly educated compatriots, my conclusion about "good enough" parents is logically inescapable. So is the conclusion from Art's research; to wit, the African-American families in California did expose their children to learning opportunities sufficient to maintain their intellectual growth over the school years. The fact that their IQ test scores lagged behind those of Whites is not likely to be explained by differences in learning opportunities.

An interesting parallel to this work is our longitudinal study of interracial adoptees. At the average of 7 years, the African-American adopted children scored 106.1 on IQ tests. By the average age of 18 however, their IQ scores had declined to 96.8. Children with one White and one Black parent scored, on average, 109.0 at age 7 and 98.5 at age 18; children with two Black parents (and later adoptive placements) scored 96.8 at age 7 and 89.4 at age 18. The test performance of the Black/Black adoptees was not different from that of ordinary Black children reared by their own families in the same area of the country. My colleagues and I reported the data accurately and as fully as possible, and then tried to make the results palatable to environmentally committed colleagues. In retrospect, this was a mistake. The results of the transracial adoption study can be used to support either a genetic difference hypothesis or an environmental difference one (because the children have visible African ancestry). We should have been agnostic on the conclusions; Art would have been.

A less recognized line of research, and one with great implications for developmental psychology, is Art's use of younger White children to model the test performance of older Black children. By showing that response and error patterns of Black children matched, on average, those of White children two years younger, Art did more than challenge the test-bias literature. He showed that differences in test performance among age-matched White and Black children can be most simply explained as differences in rates of mental development. The implicit analogy to physical growth is powerful: Slower growth rates over the same length of time lead to lesser final attainments, whether one is speaking of height or of intelligence. The implications of these studies are truly frightening, but Art does not flinch. I have yet to see these findings incorporated into introductory psychology textbooks or developmental texts, however, so the wrath of Politically Challenged has not rained down on him yet.

Scholarly Reviews

Among his many works, those that will be most widely cited and remembered are his rigorous reviews of data on test bias, evidence for the "g" in general intelligence, and reviews of research

on group differences in IQ and achievement. In scholarly yet accessible prose, Art tells coherent stories that make the best sense of complex theories and data. Along the way, he refutes the many ad hoc claims about test bias, disposes of theories of multiple intelligences, and lays waste to naive environmental theories of race and social class differences in educational achievements. In a dozen impressive books and hundreds of articles, spanning 30 years, Art has brought uncompromising logic and scientific rigor to the most controversial topics of our age.

In my last term at the University of Virginia, I taught an undergraduate course on intelligence. The text was *Bias in Mental Testing*. At first, some students were surprised and even alarmed that many of their assignments were drawn from a book by that infamous Dr. Jensen. But they came to appreciate the serious nature of the book and its helpful chapters on testing, validity, reliability, and potential biases in mental tests. By the end of the semester, they felt they had accomplished several feats -- to have read nearly all of the 700+ pages and to have passed tests on the content. Another accomplishment was their open minds about the content and the author, whom they came to admire. It's a splendid book.

Notoriety

Art seems to have been genuinely surprised by the notoriety he attained from his writings on race and IQ. Others cannot understand his surprise. When one lobbs hand grenades at the intelligence and potential achievements of others, one should anticipate a violent reaction. For Art to say that only 5% of the Harvard Education Review article concerned racial difference in IQ is like saying the only problem Lincoln had in the time he attended Ford's theater was the split second he was shot. Somehow, the percentage is not the critical issue in either case.

Anticipated or not, the consequences of his notoriety were severe and prolonged. Few can claim to be, or to have been, as sorely tested as Art has been in defense of psychology as a science. I have witnessed his steadfastness in the face of a screaming, unruly mob who disrupted his lecture on learning and intelligence and threatened his personal safety. I learned what it was like to be spat upon and to put my body on the line to get Art out of a University of Minnesota auditorium. It was shocking and frightening, as surely the radicals intended, but it was most of all infuriating, because no disciplinary actions were taken against those who assaulted us. Those were the wonderful 1970s.

As he mentions in his essay (this issue), his automobile tires were slashed, police had to open his mail, and his office at the University of California-Berkeley was stripped bare to protect him from a potential bomb. Art's office at Berkeley was more like a San Quentin cell than a typically cluttered faculty office. His family was threatened, and his personal freedoms seriously compromised -- all because he reported his conclusions about genetics and IQ, based on a serious scientific review of the research literature.

By his own account, he is no extravert. Nor, I may add, did warmth and humor soften the

acrimonious exchanges he had with hostile audiences. One might also observe that insight into his violent, enraged opponents was lacking. The logical, unemotional Dr. Jensen would never behave in such an uncivilized manner, nor comprehend those who do.

Art Jensen has also endured abuse from thugs with pens instead of megaphones. Personally, I have no empathy for politically driven liars, who distort scientific facts in a misguided and condescending effort to protect an impossible myth about human equality (= identity). Art believes he understands the motives of the Marcus Feldmans, Steven Jay Goulds, and Leon Kamins of the intellectual world. They seem to speak his language, albeit with forked tongues. I find them despicable, because they have the knowledge and intellect to know that they deliberately corrupt science. To deny falsely the scientific evidence that nearly all measurable human traits are moderately to highly heritable is to deny parents and policy makers essential knowledge to run their own lives and the society as a whole. Self-appointed saviors of the equality myth are far more dangerous to an honest psychological science than a hundred outraged groupies who don't know that the lecture was supposed to be about, anyway.

All in all, with clear conscience, Art stands up for data, searches for the most logical and supportable explanations, and rejects all of the ad hominem garbage thrown his way.

I did observe a humorous episode with the notorious Arthur Jensen. While at York University, we took a little stroll to a neighborhood shop, where another customer asked me if we were from the conference on intelligence. She had heard that the terrible Arthur Jensen was there. "I can't understand how they could have let him in the country!," she proclaimed. With Art standing mutely at my side, I told her that Dr. Jensen was indeed present. "Is he as awful as they say?," she asked. "Oh yes," I said, "dreadful!" At least that's the way I recall it.

Art Jensen's contribution to psychological science are enormous, and they continue to mount. His work includes the impeccable tome on test bias, the most thoughtful research on learning and intelligence, and some critical studies on race and environment. The massive body of work will persist for generations of psychologists. Yet, I believe that his most important contribution is intellectual honesty and integrity to a psychological science that is threatened with Politically Correct corruption. Art has not known how to be politically expedient, or to couch his ideas in soothing terms, so that he has often suffered academic rejection. But most people heard you, Art, and they remember, even if they did not like the message. Both inside and outside of academia, your intellectually honest legacy will prevail.

Jensen on "Jensenism" by Arthur R. Jensen

University of California, Berkeley

"Though Jensenism is a term listed in several dictionaries, Arthur Jensen has produced a more extensive body of work than suggested by the dictionary entry. To the public, he is mainly known for his work on the genetics of intelligence. This article discusses the work that is publicly less well known. Work discussed includes studies in learning, memory, the cumulative deficit hypothesis, Spearman's hypothesis, and speed of information processing, to name a few. The publicly better known work is also discussed. A bibliography of Jensen's publications is included in an appendix. (Abstract written by D. Detterman)"

To discover that one's name has entered the dictionary as an "ism" is both flattering and embarrassing, and is cause for reflection. I know because it happened to me. Recent editions of a number of dictionaries contain the word "Jensenism." The Random House and Webster's Unabridged Dictionaries, for example, contain the following entry:

Jensenism, n. the theory that an individual's IQ is largely due to heredity, including racial heritage. [1965-1970]; after Arthur R. Jensen (born 1923), U.S. educational psychologist who proposed such a theory; see -ism] -- Jensenist, Jensenite, n., adj.

For those who understand the meaning of heritability in quantitative genetics, the wording is rather inept and the "theory" attributed to me has been around at least since the time of Francis Galton (1822-1911), whose *Hereditary Genius* (1869) predated the very article that led the popular press to label me a "hereditarian" by exactly one century. The dictionary definition can't be overly derided, however, as it is quite true that, in 1969, I did present a fairly comprehensive review of the evidence that IQ is substantially heritable and had stated that it is a reasonable hypothesis that genetic as well as environmental factors are involved in the well documented Black-White average difference in IQ. Also, I like to think that I was partly responsible for getting Galtonian thinking back on track in differential psychology after it had been derailed in the behavioral sciences for at least a generation following World War II (the period dominated by what Sandra Scarr once referred to as "naive environmentalism").

However, the more serious disadvantage of having one's name turned into an "ism" is that, from that moment on, one is liable to be identified only as the "ism" in the dictionary. The rest of one's research activity can be unfairly eclipsed, and findings and formulations that are unique and perhaps even fundamentally more important are forgotten. One of my aims here is to forestall this threatened eclipse of other aspects of my research and shine some light on how that which got me labeled as an "ism" fits into the larger orbit of my lifetime's work.

Essentially, I have always been a differential psychologist. Human idiosyncracies and individual differences in behavior interested me before I had ever heard of psychology. The first book I read on the subject, more or less by accident while in high school, was J.B. Watson's *Psychology From the Standpoint of a Behaviorist* (1929). It was probably the main reason I chose to major in psychology in college, after reluctantly but realistically deciding not to pursue a career in music. Though I became acquainted with some well-known psychologists, such as Edward Tolman and

Egon Brunswik, as an undergraduate psychology major at Berkeley, the one psychologist whose work most captured my attention (but whom I never saw in person) was the then Sterling Professor of Psychology at Yale, Clark L. Hull, a latter-day Watsonian and Pavlovian behaviorist. One could say that I became a Hullian, and I recall writing a long term paper for one of my courses extolling Hull's theory of learning -- excessively so, according to the comments of the TA (one of Edward Tolman's graduate students) who graded my paper. Primed, I suppose, by Watson, I was especially attracted to Hull's purely mechanistic system for explaining behavior, as spelled out in his *Principles of Behavior* (1942). B.F. Skinner's *Behavior of Organisms* (1938) was also appealing but lacked the systematic theoretical system that made Hull's approach seem more promising to me.

I was totally unaware at the time that these now classic works in psychology, and indeed my whole undergraduate education in psychology, neglected individual differences and the influence of genetic factors on behavior. These topics were scarcely admitted as part of the field of psychology, at least as it was presented at Berkeley in the 1940s. Experimental psychology dominated the department at that time, and the implicit assumption of experimental psychology was that individual differences in the behavioral realm originated entirely outside the organism, through its exposure to different environmental contingencies, and they could be explained, if one were at all interested in doing so, in the purely stimulus-response-reinforcement terms of conditioning and learning. In its focus on discovering general laws or principles of behavior, experimental psychology traditionally treated individual differences as a nuisance variable, or as merely error variance in the statistical analyses of its data.

This limited perspective of my undergraduate courses in psychology was extremely implicit and so completely taken for granted that it did not enter my consciousness until some years later. I occasionally meet psychologists even today who think of individual differences as error variance or as purely a product of environmental diversity. I was still largely operating on this assumption in 1964 when I wrote a major paper that attempted to explain social class differences in scholastic learning entirely in terms of the then current S-R theories and principles of verbal learning (67). Ironically, the publication of that paper was so long-delayed that it appeared after my position on the major basis of individual and group differences had changed in a hereditarian direction. Large differences in the publication lag of one's articles and book chapters during certain periods may even create a false impression of contradictory vacillations in one's theoretical stance. The publication dates of one's articles are not always perfectly correlated with the actual chronology of one's changing position on theoretical issues.

Thanks to the beautiful "recreational reading" room (the Morrison Library) on the Berkeley campus, where I spent most of my evenings, I believe I got as much or more of my undergraduate education from entirely self-selected extracurricular reading as I got from my courses and textbooks. The most lasting influence I recall are works by M.K. Gandhi, Bertrand Russell, G.B. Shaw, Havelock Ellis, H.G. Wells, Aldous Huxley, Alfred Korzybski, and biographies of famous musicians, scientists, and philosophers. They instilled a certain critical

sense as well as a humanistic idealism that, in the long run, made a greater impression on me than did most of the relatively uninspiring textbooks I was required to read in my courses. To make more time for the reading I most liked, it was my policy never to read anything in my college textbooks more than once.

It was my extracurricular reading, probably more than anything else, that led me to look for the ways psychological science might have practical applications that could benefit individuals and society. Some years later when I decided to enter graduate school to work toward a Ph.D., I examined various university catalogues to see what they offered in applied psychology. I recognized more of the names of psychologists whose works in applied areas, such as clinical and educational psychology, that I had already come across in my reading on faculty of Teachers College, Columbia University than in any other university catalogue. Egon Brunswik's course on the history of psychology had also left me with a distinct impression of Columbia as having one of the pioneer departments of psychology, shaped by such luminaries as James McKeen Cattell, E.L. Thorndike, and Robert Woodworth. (When I arrived at Columbia, Woodworth was still lecturing at age 87, and I audited his two courses.) The fact that Columbia University is located in New York City, home to Carnegie Hall, Toscanini and the NBC Symphony, the New York Philharmonic, and the Metropolitan Opera, provided a powerful added attraction. The musical capital of America, New York is visited each year by many of the world's greatest orchestras, conductors, and virtuosos. And my interest in music has never been second to my interest in psychology, though I have necessarily devoted more time to the latter, of course, since it has been my livelihood. When I wasn't on the Columbia campus, chances are I was hanging out in Carnegie Hall, either at a concert or a rehearsal.

At Columbia's TC I studied educational, clinical, and personality psychology. My Ph.D. dissertation (under Professor Percival Symonds) was on the Thematic Apperception Test as a measure of aggression (2,3). I found my three years as Symonds' research assistant much to my liking. However, my interest in the subject of his research at that time, based on the psychoanalytic or "dynamic" interpretation of various projective techniques (8, 20), proved short-lived. Though Symonds was a man of noble character and in many ways a fine mentor, my three years at TC were probably influenced more by the lingering shadow of the psychologist who had been Symonds' mentor but who had died three years before I arrived at TC -- Edward L. Thorndike, probably America's greatest psychologist. Thorndike's influence and his conception of psychology still pervaded the intellectual atmosphere at TC during my tenure and was repeatedly reinforced by an imposing portrait of the great man that hung on the wall above the card-catalogues in the TC library. I felt compelled to read some of Thorndike's books and I liked them a lot, especially for their clear thinking and their objective and empirically anchored approach to the remarkably broad range of subject matter in psychology with which he dealt.

It is amazing how much of what today is viewed as established fact in psychology was either discovered or presaged by E.L. Thorndike. As he was one of the leading pioneers of psychology as a natural science, he became the first of my "heroes" in psychology; the other two (Galton and

Spearman) I discovered a few years later. These are the three psychologists whose key works I return to and re-read for their wealth of hypotheses, original and insightful ideas, and inspiration, always to be rewarded. If there have been any authentic geniuses in the history of scientific psychology, in my estimation they include at least these three. (I have written about Galton [238, 352, 383] and Spearman [239, 353, 383].)

During my clinical internship at the University of Maryland Psychiatric Institute in Baltimore, I examined a great variety of psychiatric patients, using all of the prevailing techniques of clinical psychology, and typically wrote a clinical report on each patient. During my training experience in psychotherapy, I quickly came to realize that I was less satisfied and less effective working with people directly than in working with data. I did not enjoy many of the routine aspects of clinical work, probably because I am quite low in extraversion. Hence I welcomed collaboration with one of my clinical supervisors in some research we did on the Rorschach as an index of pathological thinking that completely eschewed the traditional systems of scoring Rorschach protocols and was solely based on characteristics of the subject's verbal expression (5; see also 39, 46).

It was also at this time that I began seriously reading the books and articles of Hans J. Eysenck, who was then a maverick personality researcher and the professor of psychology in the University of London's Institute of Psychiatry. Most of my evenings that year were spent reading every book and article by Eysenck that I could find in the university library, as well as many of the references he made to the influential work of others, particularly Galton, Spearman, and Thurstone. This provided a much needed antidote to the predominantly Freudian or psychoanalytic concepts that informed my clinical work. It was not so much the specific aspects of Eysenck's own theories or his research, but rather his general approach to psychology as a natural science that provided my first real sense of finally having discovered my true vocation. I felt I was no longer groping for the path that I should take to make my life seem worthwhile. I believed that research and teaching in the field of differential psychology, broadly conceived, was exactly the path for me. So I wrote to Eysenck for his permission and applied to NIMH for a postdoctoral fellowship to spend a year in Eysenck's department in London. Luckily, both were granted and, with a year's extension of my fellowship, I had the good fortune to spend two full years with Eysenck. (Six years later I returned to his department as a Guggenheim Fellow for another full year during my first sabbatical leave from Berkeley [detailed in 149, 378]).

I emphasize my postdoctoral work with Eysenck, because I believe it planted the seeds of virtually everything I have done since then. It put me on the path that I have followed, in one way or another, for all of my later research. Although each of the many subsequent byways could not have been anticipated, they all led more or less consistently in one general direction -- what came to be known as the London School of differential psychology, originated by Galton and with Spearman, Burt, and Eysenck successively as its leading exponents (283, 376, 377). (I knew personally only Eysenck [378] and Burt [126, 225, 326, 367].) The London School is not really a school or even a doctrine or a theory. Rather, it is a general view of psychology as a

natural science and as essentially a branch of biology.

Its central concern is variability in human behavior. It is Darwinian in that it views both interspecies variation and an important part of intraspecies variation (both individual and group differences) in certain classes of behavior as products of the evolutionary process. It is behavior-genetic in that the evolutionary process depends upon genetic variation and selection, and the neural basis of behavioral capacities is subject to these evolutionary mechanisms the same as other physical characteristics. It is quantitative in that it emphasizes the objective measurement and taxonomy of behavior and the operational definition of latent traits or hypothetical constructs. It is analytical in that it subjects quantitative data to mathematical formulation and statistical inference. It is experimental in that it typically obtains measurements, both behavioral and physiological, under specifically defined and controlled conditions. It is reductionist in that it aims theoretically to explain complex phenomena in terms of simpler, more elemental processes. It is monistic (as opposed to dualistic) in that it neither posits nor seeks any explanatory principle that does not consist of strictly physical processes; it views complex psychological phenomena as emerging solely from interactions among more elemental neurophysiological processes and their past and present interactions with environmental conditions.

Besides the extensive reading, studying (courses in multivariate statistics with Patrick Slater and factor analysis with A.E. Maxwell), and writing (4, 6, 7, 9, 14) that occupied my time as a postdoc, I undertook laboratory research on individual differences in the effects of massed and distributed practice in selective stimulus-response learning and I devised a special apparatus for the directly measuring individual differences in reactive inhibition independent of any form of learning per se (51). The specific hypotheses I tested derived from Eysenck's theory of the basic neural processes responsible for individual differences in extraversion-introversion (or E, as it was called), which had been established as a continuous unitary trait by the factor analysis of personality inventories, behavioral ratings, and objective behavior measurements derived from certain laboratory techniques. Eysenck's theory of E at that time brought me back to Clark Hull's theory of learning, which had first fascinated me as an undergraduate. I became a born-again Hullian, this time around becoming more thoroughly versed in every facet of Hull's theory and most of the theoretical and empirical literature related to it, including Pavlov's classic work on conditioning.

Eysenck's theory held that the basis of E is the rate of build-up of a hypothetical neural process called reactive inhibition, or IR (as defined in Hull's system). The theory contends that trait extraversion reflects a more rapid build-up and a slower spontaneous dissipation of IR under the conditions in which IR is hypothesized to be manifested in behavior, such as the experimental extinction and spontaneous recovery of conditioned responses, the effect of massed trials versus spaced trials in serial rote learning, and the reminiscence effect in motor learning (as on the pursuit-rotor). It was this aspect of Eysenck's research program that led me into theories of learning and the experimental psychology of human learning, which soon completely

overshadowed my interest in personality research. I saw the study of individual differences in learning in its own right as a more fundamental and scientifically researchable subject than the study of personality. The last postulate in Hull's behavior theory in its final form (in 1952) states that individual differences in learning, or excitatory potential (sEr), are a net product of individual differences in each of the hypothetical constructs in his system, such as habit strength (sHr), drive (D), reactive inhibition (IR), conditioned inhibition (sIr), sensory limen or threshold of stimulus activation (sLr), and spontaneous oscillation of reaction potential (sOr). I thought this approach provided the basis for a rigorous, quantitative and experimental approach to the study of individual differences in human learning. I later elaborated on this idea in a paper that, in retrospect, strikes me as an overly ambitious and practically unfeasible program for research on individual differences in human learning (59). Since the largest part of the individual differences variance in the forms of learning that are important for education and the acquisition of many other real-life skills is factorially indistinguishable from Spearman's g, or general intelligence, I now believe a program of research on the nature of g to be probably more fruitful than focusing on learning per se (189, 301).

But before going on with my story, I should point out what may not be well known to younger readers, that Hull's system, which dominated the learning field from about 1940 to 1960 (he died in 1952), waned rapidly in the early Sixties and became virtually extinct by 1970. Since then, Hull's citation index has hovered close to zero. This is a remarkable fate for one who, for over a period of at least twenty years, many considered the leading theorist in scientific psychology. In marked contrast, E.L. Thorndike, 48 years after his death, remains among the 100 most frequently cited psychologists in recent decades, and the number of citations of Charles Spearman has increased in each decade since his death (in 1945) and risen most rapidly since 1970.

Thorndike's and Spearman's intuitions, hypotheses, theories, and the phenomena on which their interests were focused, mainly learning and cognitive ability, were evidently more important, more original, and scientifically more productive than Hull's precisely formulated theory of learning, however impressive his achievement seemed in its day. The problem, I think, was not Hull's in use of the hypothetico-deductive method, which I believe was exemplary, but that the many interrelated parts of his whole grand theoretical edifice, its postulates (as Hull called them), were erected on too slim a foundation of empirical studies. Hence the subsequently growing number of experiments inspired by the theory and devised to test it increasingly failed to confirm its predictions. Though modifications and additional ad hoc principles were proposed to meet the explanatory demands imposed by new empirical evidence, Hull's system gradually collapsed beyond repair and was eventually discarded, much like the geocentric theory in astronomy and the phlogiston theory in chemistry. In the history of science, of course, this is a perfectly respectable demise for a theory. The really fatal shortcoming of Hullian theory, however, was its nonbiological behaviorism, a position that was bound ultimately to leave it theoretically barren.

Rather early in my career, while still a Hullian, I tried to modify Hull's theory to make it accommodate some of the contradictory experimental evidence by proposing a fundamental mathematical reformulation of the treatment of reactive and conditioned inhibition within the Hullian framework (18). But this kind of ad hoc doctoring could not save Hull's system any more than postulating retrograde motion of the planetary epicycles could preserve Ptolemy's geocentric theory. Though I gradually lost interest in Hull's theory, my interest in human learning, particularly in its individual differences aspect, was undiminished.

Now that the stage is set, with a backdrop of the values and attitudes against which all my later activity can be more understandable, I will provide a brief account of the specific studies that I believe mark the key points in my research activity, and how and why I moved from each point to the next. Studies never arise from thin air, of course, but also one does not have to go looking for things to research. Each new project, it seems, is absolutely compelled by the preceding ones, or by one's purposeful and critical reading of the literature or by one's self-criticism and others' criticisms of one's previous work. The completion of each study always leave some loose ends. Problems abound and one continually searches for what seems the most fruitful path toward each problem's solution. Given the pages allotted me, this account is necessarily quite telegraphic, referencing only my main publications on each topic. A perusal of my bibliography (see Appendix) indicates that my publications fall into six main categories: (i) clinical and personality, (ii) human learning, (iii) behavior genetics, (iv) racial-cultural differences, (v) test bias, and (vi) mental chronometry and g theory. (I will ignore the first category, with some dozen or so articles, which in retrospect I consider of much less importance or interest.)

Human Learning [deleted for brevity]

The Behavior-Genetics of Intelligence

When, in 1966, I was invited to spend a year at the Center for Advanced Study in the Behavioral Sciences, I had enough research material on the learning characteristics of culturally disadvantaged children, as they were called at that time, that I thought I could best spend my year at the Center writing a book about my findings. I took all of my research material with me and began work at the Center, a wonderfully undisturbed and heavenly atmosphere for study and writing, with a most helpful staff and the intellectual companionship of the many other fellows at the Center.

A reasonably comprehensive book about the educationally disadvantaged children, I thought, should contain one short chapter addressing the issue of the inheritance of intelligence, if only to show that this line of explanation for individual and group differences in scholastic performance could be dismissed as outmoded and scientifically discredited. I had never given this topic much thought and knew shamefully little about it at that time. It had never been touched upon in my entire education to that point and the subject was generally either unmentioned or scorned by virtually everyone I knew working in the field of learning and the educationally disadvantaged.

My first exposure to it was in 1957 during my postdoc in London, when I attended a lecture on "the inheritance of mental ability" by Sir Cyril Burt. Though I was highly impressed by Burt's lecture as a brilliant tour de force, its subject didn't really capture my interest at that time. Burt's lecture was later published in the *American Psychologist* (1958, 13, 1-150), and it seemed a good place to start what became my program of reading virtually the entire world literature on the genetics of mental ability at that time. I hadn't expected to go that far into the subject, but the more I read, the more I realized it couldn't be dismissed and had to be taken seriously.

In order to be able to evaluate much of what I read, I had to tackle the technical aspects of quantitative genetics. Luckily, a professor of ethology and genetics was also a fellow at the Center that year and was a most helpful tutor and guide to the literature on quantitative genetics. I felt most resentful of the fact that I had reached that stage of my education and of my career and had not been exposed to the existing scientific knowledge on the genetics of mental ability. I was even more dismayed to realize that my case was all too typical of those working in most branches of psychology, particularly experimental, educational, and clinical. All human variation in abilities was attributed to the learning opportunities afforded by different environmental and cultural circumstances to which individuals were exposed. Though at that time the literature on behavior genetics was but a fraction of its present volume, what there was seemed sufficient to call in question the prevailing 100 percent environmentalism of the 1950s and '60s. My task was cut out for me: to help dispel the ignorance that generally prevailed in educational psychology concerning the role of genetic factors. In reading E.L. Thorndike, the father of American educational psychology, I found that he was on the right track in his intuition about the importance of genetic factors in individual differences, but his line of thought on this subject rapidly went out of fashion shortly after World War II, for no good scientific reason.

Therefore, during my year at the Center, I wrote several articles that stemmed from my new-found interest in the genetics of mental ability and its implications for education (61, 62, 63, 64, 68, 70). The most frequently cited of these articles is based on my examination of the famous Hoizinger formula for estimating heritability from the difference between the correlations between MZ twins and between DZ twins. I showed that Hoizinger's formula, which was virtually the only one ever used in studies of the heritability of intelligence up to that time, did not estimate heritability as it is defined in quantitative genetics, nor did it take account of the effect of assortative mating on the estimation of heritability from twin data (61; see also 178). I provided a new formula that not only accorded with the meaning of broad heritability as defined in genetics but also took account of assortative mating. (The formula could also be generalized for estimating heritability with other kin-ships besides twins, such as full siblings and half siblings.) I used this formula to recalculate heritability coefficients for IQ on every published study of MZ and DZ twins.

Although the articles I wrote that year emphasized the evidence for the substantial heritability of individual differences in IQ, I thought (and wrote) that it was unnecessary to invoke genetic causes for the observed racial differences in IQ, which I thought could be explained in terms of

cultural bias in the tests and poor environmental opportunities for acquiring the particular knowledge and skills called for by conventional tests. One of my articles written at the Center (63), which originated as an invited address at a convention was titled "How Much Can We Boost IQ and Scholastic Achievement?" It came to the attention of the editors of the Harvard Educational Review, and in 1968 (when I was back at Berkeley) they asked me to expand it into a more comprehensive article for the Spring, 1969 issue of the Review. They even provided an outline of the topics they wanted me to deal with in the article, including my view on the heritability of race differences (which I had not previously mentioned). I gladly accepted the editor's invitation, as an opportunity to consolidate what I had been studying and thinking about during my year at the Center. The result was a 200-page typescript which became a 125-page article in the Harvard Educational Review (HER) titled "How Much Can We Boost IQ and Scholastic Achievement?" (76). Though unexpected at the time, I suppose it was the article that forever changed my life, for better or worse.

My Year of Turmoil

Based on a review of the empirical literature, my HER article made four main claims:

(i) experimental attempts to raise the IQ of children at risk for low IQ and poor scholastic performance by various psychological and educational manipulations had yielded little, if any, lasting gains in IQ or scholastic achievement; (ii) individual differences in IQ have a high heritability (.70-.80, corrected for attenuation), but environment also plays an important part; (iii) most of the exclusively cultural-environment explanations for racial differences in IQ and scholastic achievement were inconsistent and inadequate, so genetic as well as environmental factors should be considered; and (iv) certain abilities, particularly rote-learning and memory (i.e., Level I ability) have only a weak relationship to IQ, which suggests that these Level I abilities might be used to compensate to some extent for low IQ (i.e., Level II ability) and thereby make school instruction more beneficial for many children, regardless of their racial or social class background, who are below average in Level II but are average or above in Level I. (Pupils with this pattern of abilities constitute the majority of those who are most at risk for failure under traditional classroom instruction.)

Viewed as a whole, it seemed quite reasonable. But it was the few pages on race differences in IQ and achievement (about 5% of the article) that aroused so much sound and fury, most of it focused on the one sentence that violated what I later came to realize is the greatest taboo in the latter half of the twentieth century. Here is what I wrote concerning the Black-White difference in IQ: "The preponderance of the evidence is, in my opinion, less consistent with a strictly environmental hypothesis than with a genetic hypothesis, which, of course, does not exclude the influence of environment or its interaction with genetic factors" (76, p. 82).

That one aspect of the article was blown up by the mass media, with feature articles in TIME, Newsweek, LIFE, U.S. News & World Report, the New York Times Magazine, and many other

newspapers and magazines, as well as radio and TV programs. The Berkeley campus was in an uproar for weeks (and sporadically for months and even years thereafter) with bands of demonstrators disrupting my classes, slashing all the tires on my car, and painting swastikas on my office door. The student paper, *The Daily Cal*, carried many denunciations and only a few defenses of my position, and there were demands from dissident groups that I be fired. The campus police assigned plainclothes bodyguards to accompany me whenever I left my office, and for several months the campus bomb squad handled the screening and opening all of my mail, even some of the unidentified mail received at my home. There were telephoned and mailed threats on my life and on my family; phone calls were routed (and recorded) through the local police station. A number of the calls that came in over one period of several days so worried the police that they urged me and my family to spend a week away from our home at some unknown location, as the police could not provide 24-hour protection. (We stayed with friends in a neighboring suburb; an inconvenience, but as they had a lovely swimming pool, it was a pleasant diversion.) Worst of all, from my standpoint, was that my on-going research in the Berkeley schools was immediately terminated and permanently proscribed by the Berkeley school officials (128). When I asked one official for an explanation, he remarked, "The Berkeley schools are a political unit, not a research institute."

Many other harrowing incidents followed, some taking place when I was lecturing on other college campuses, both in the United States and abroad, even when my lectures didn't touch on the subjects of genetics or race. The largest, most tumultuous demonstration I ever experienced was, surprisingly, at the University of Melbourne, in 1977, where about fifty policemen had to rescue me from a madding mob. The unprovocative topic of my [undelivered] lecture: The relationship between intelligence and learning [189; see also 301]. The very next day the same thing happened in the same setting to Hans Eysenck. His topic: the relationship between personality and learning. (I have written at greater length in the Preface to my *Genetics and Education* about the bizarre events following the publication of my HER article [112; see also 149].)

The really important consequence of the HER article for my subsequent activity was that it raised a number of questions and issues concerning subjects that called for fuller explication or further research. In many articles (from #77 on) and three books (143, 144, 206), I consolidated my position on these subjects as best as empirical research permitted at that time and launched new research on the remaining unanswered questions and speculative hypotheses. Some people advised me to get out of this controversial area altogether. One eminent psychologist friend warned that if I scorned the *Zeitgeist*, it would in turn scorn me. However, rather than duck for cover, which I peculiarly felt would be disgracefully un-Gandhian, I resolved not to be whipsawed by the prevailing orthodoxy in the social and behavioral sciences, but to do whatever I could to reform the social sciences. And I believe that at least the scientific community, if not the media and the political establishment, has indeed changed its mind if not its voice over the past 30 years, with an almost total collapse of naive environmentalism and an increasing recognition, at least in the pages of academic journals, of the importance of genetic factors and of environmental factors with biological effects on the development of human mental ability.

The well-known survey by Synderman and Rothman (1988) of over 600 psychologists in the relevant fields showed that their modal response on every question that involved the very issues considered heretical in my HER article agreed with the position I then stated. To what extent my own work may have helped usher in the new perspective would be impossible to estimate, but I believe I have played a role. Many other influences, of course, have brought about the demise of doctrinaire environmentalism and advanced the biological orientation of mainstream behavioral science.

Bias in Mental Testing

At about the time of my HER article, the question of culture bias in mental tests was frequently brought up. I was familiar with the early research on social class bias in standard tests, pioneered by Kenneth Fells (who had been one of my professors), but I found rather little more than speculation in the literature regarding test bias with respect to racial or ethnic groups. Yet that question was crucial. I reviewed what little evidence existed on the subject in the mid-1960s (69, 99), but found it inadequate and largely unconvincing. Besides the educational, social, and economic unfairness of using tests that are differentially and systematically inaccurate for different racial, ethnic, and social-class groups in our population, I considered also the scientific importance of test bias for the field of psychology in its own right. Psychometrics -- the science and technology of mental measurement -- is of course basic to many fields in psychology, as indeed reliable and valid measurement is essential for the development of any science or technology. To the degree that the standard psychometric instruments then in use were biased, either by culture, social status, or gender, basic research in differential and educational psychology as well as the practical applications of testing in educational placement, in college admission, in personnel selection, and in assigning recruits to various training schools in the armed services were all compromised by having to operate with deficient tools.

I thought it imperative to devise methods for detecting the presence of various kinds of psychometric bias. This became the main focus of my research effort for the next few years (109, 153, 176, 179, 181, 182, 289). It culminated, in 1980, with the publication of my *Bias in Mental Testing* (199; see also 202,203,217), an 800-page tome which was then (and may still be) the most comprehensive work on the subject. Research on criteria of bias based on a test's so-called external validity, that is, its practical predictive validity (i.e., both the regression [and correlation] of criterion measures on test scores) in different sub-populations had already been quite well investigated by psychometricians during the period between 1970 and 1980. Though I fully explicated this work in *Bias*, my own research contributions emphasized internal indicators of bias, such as whether different groups, (e.g., Black-White, male-female) differ significantly in various psychometric features such as the test's reliability, the test items' rank order of difficulty, the test scores' correlation (and regression) with chronological age, the relative frequency of choosing various distractors (i.e., error responses) in multiple-choice tests, the groups' similarity in the factor structure, and the groups' similarity in kinship correlations and heritability values for the test in question.

A methodological innovation I introduced was the use of what I termed "pseudo-race age groups." For example, when I found significant differences between Black and White school children in their specific choices of error distractors (in the Raven Progressive Matrices test), I created two "pseudo-race" groups composed entirely of White children, the groups differing in age such that the younger group and the older group had the very same mean difference in total test score as the mean difference between age-matched Blacks and Whites. I discovered that the same-age Black-White differences in the frequencies of selecting a particular distractor (i.e., a wrong answer) among the several distractors for each item on the Raven test were virtually identical to the differences between the two groups of White children that differed in age by almost two years (approximately ages 8 years and 10 years). Applying this method to a variety of tests, including Gesell's Figure Copying test (a good predictor of scholastic performance in the primary grades), free drawing, and several Piagetian tests, we found that in every feature of test performance, age-matched groups of Black and White children differed in exactly the same way as did "pseudo-race" groups of different-age White children when the age of the younger group is about 80% that of the older group.

Our findings with pseudo-race groups suggested that the observed racial differences in performance were not attributable to test bias, but reflected a developmental difference in rate of mental maturation, with Whites (and more so, Asians), on average, having a steeper trajectory and a higher asymptote. From my own studies and my review of the total empirical literature on test bias, I concluded in *Bias*: "...the currently most widely used standardized tests of mental ability -- IQ, scholastic aptitude, and achievement tests -- are, by and large, not biased against any of the the native-born English-speaking minority groups on which the amount of research evidence is sufficient for an objective determination of bias, if the tests were in fact biased" (p. ix). Essentially the same conclusion was announced independently two years later in a joint report by the National Research Council and the National Academy of Sciences (Wigdor & Garner, 1982), which had chosen a panel of nineteen leading experts in psychometrics to review the evidence.

The Cumulative Deficit Hypothesis

One hypothesis proposed in the 1960s to explain the Black-White difference in the trajectory of raw scores on mental tests and on scholastic achievement across grades 1 to 12, held that the increasing racial disparity in test performance with increasing age is the result of a cumulative deficit in learning, such that failure to learn particular knowledge or skills thoroughly at one grade level hinders the ability to learn more advanced material in later grades. Because Black children, on average, begin school having learned less of the prerequisites for learning in the primary grades, they fall further and further below national norms in scholastic achievement with each additional year. Progressive learning deficit is thought to act cumulatively, like mounting credit card debt. This hypothesis was popular in the 1960s and provided much of the rationale for Head Start and other compensatory education programs (54; see also 158, 162, 304, 314, 380).

My investigation of the phenomenon, however, found the evidence for it ambiguous, at best. The divergence between Black and White test scores with increasing age or grade level in school was fully apparent when looking at raw scores, but there was little, if any, evidence for a divergence of Black and White mean scores when the scores are expressed as standardized scores. That is, when measured in age-standardized scores, the mean Black-White difference of about one standard deviation remains constant from kindergarten to 12th grade, because the standard deviation within each group also increases proportionally with age.

I reasoned that if there were a true cumulative deficit effect for IQ, and if it was the cause of Blacks' lower average IQ, and if IQ declined the longer a child stayed in a culturally disadvantaged environment, then Black children at any given age should have, on average, a lower IQ than that of their younger siblings. The cumulative deficit theory predicts that the positive difference between the ages of the older (O) and the younger (Y) sibling is positively correlated with the Y-O difference in IQ. There should be a substantial such correlation among Blacks (i.e., the older sib should have a lower IQ than the younger sib), but this effect should be negligible or nonexistent for middle-class and upper-class Whites. A significant correlation for Blacks would support the favored environmental explanation of the cumulative deficit, because there is nothing in genetic theory which would predict a systematic difference, on average, between the genotypes of full siblings for any given characteristic, as each sib receives a random set of half of each of its parent's genes.

I tested this prediction with several hundred pairs of Black siblings and White siblings, all of school age (156). Despite the large samples, the hypothesis was not born out, although the theory-predicted correlation was significant ($p < .05$, one-tail test) only for verbal IQ in the all-male sib pairs, and then only for those, in the primary grades. No other subdivision of the data revealed the slightest indication of the predicted correlation, for either Blacks or Whites.

This null outcome made me wonder if the Black population in Berkeley, California, despite its typically lower IQ compared to Whites and Asians in the same schools, was somehow atypical of the general Black population, perhaps being less environmentally disadvantaged. The cumulative deficit might occur only in children whose environmental disadvantage falls below a critical threshold necessary for normal phenotypic development of the individual's genotypic potential. I realized, therefore, that another study using exactly the same methods would have to be done in an area where there could be no question that the vast majority of the Black school children lived in a conspicuously impoverished environment.

I found the necessary data for this study in a school district in one of the poorest counties in the rural South. The IQ of the Black pupils was 71, averaged over kindergarten to 12th grade the average IQ of the White pupils was 101. All of the full siblings, White and Black, enrolled in all of the schools of this rural county were included in the study. The findings were startling. The White school population showed no evidence of an age-related decline in IQ, in this respect being like the White sample in my Berkeley study. The Blacks, however, showed a marked age-

decrement in IQ, as indicated by the younger minus older sibling IQ difference -- a decrement of about one IQ point for each year of the Y-O sibling age difference. In other words, with family background controlled (by the sibling design) these Black children declined, on average, about one IQ point per year throughout their time in school (180). One might have argued that this was not necessarily an environmental effect but a racially genetic difference in the trajectory of the mental growth curves for Blacks and Whites. The California data, however, seemed to rule out this interpretation, as they evinced no such effect for Blacks. If the effect observed in Southern rural Blacks were a genetic racial characteristic rather than an environmental effect, it should have shown up, at least to some degree, in the California Blacks as well. It therefore seems most likely that some substantial part of the IQ deficit for Blacks in the poorest environments is a result of environment, most probably environmental factors that have biological consequences, such as unfavorable prenatal conditions, poor nutrition, and childhood illnesses, which can limit mental development.

Spearman's Hypothesis

While re-reading Spearman's major work, *The Abilities of Man* (1927), I came across a brief passage (p. 379) that had not previously captured my attention. On second reading, however, it made a major impact. On the basis of one slight study (by American psychologists) of Black-White differences on a variety of cognitive tests, Spearman conjectured that variation in the magnitude of the B-W difference across various tests is directly related to the size of each test's g loading. (Because the article presented only the tests' means but not their intercorrelations, Spearman could not extract the g factor with which to test his conjecture.) I henceforth referred to this conjecture as "Spearman's hypothesis." It struck me as of quintessential importance, because, if true, it is a much more general hypothesis than my Level I-Level II formulation, which appears to be just a special case of Spearman's hypothesis. Spearman's hypothesis also seemed to explain why the size of the B-W difference (in standardized units) varied so widely across different cognitive tests. This question had always been a stumbling block to the prevailing environmental theories, which were a plethora of piecemeal, ad hoc, inconsistent, and unconvincing explanations. Spearman's hypothesis, if true, would mean that the B-W difference was essentially a difference in g . Therefore, if we are to understand the phenotypic B-W difference in measurements of cognitive ability, it would be necessary to understand the nature of g itself. First, Spearman's hypothesis had to be put to a rigorous empirical test. This called for representative samples of Blacks and Whites measured on as wide a variety of mental tests as could be found. I tested Spearman's hypothesis on a large scale (224, 256, 266, 267, 268, 288, 290, 296, 324, 325, 339, 375). By publishing my analysis of much of the evidence as a target article in *The Behavioral and Brain Sciences* (266), it was subjected to commentaries by over thirty experts in psychometrics and cognitive psychology. In brief, the total evidence strongly bears out Spearman's hypothesis. It is no longer a hypothesis, but must now be regarded as an empirical fact, as much so as Galton's Law of Filial Regression or Thorndike's Law of Effect. (The most recent comprehensive summary of the methodology and evidence on Spearman's hypothesis is provided in Chapter 11 of my recent book, *The g Factor* [383].)

Speed of Information Processing and g [deleted for brevity]

Non-psychometric Correlates of g

Critics of the g construct have argued that g is merely an arbitrary artifact of the way psychometric tests are constructed and inherent in the mathematical procedure of factor analysis. If this were truly the case, I reasoned, the g factor should not be related to variables other than psychometric tests and should tend to disappear when using different factor analytic methods, assuming, of course, that such methods (like varimax rotation) are not specifically devised to scatter the g variance among a number of uncorrelated group factors.

Method Invariance of g. First, I tried to determine whether the g factor of a correlation matrix of diverse psychometric tests is more or less invariant when the g factor is extracted by any of the several quite different methods that have been used by various researchers throughout the history of factor analysis, from Spearman to the present day. By applying each of the main methods of factor analysis to real data and also to artificial data for which the g loadings of the "tests" were known exactly, it was found that g is remarkably similar across all of the different methods, as shown by congruence coefficients averaging over $+0.99$ (360).

Meta-analysis of Physical Correlates. In 1930, long before the invention of meta-analysis, Donald O. Paterson published his classic work, *Physique and Intellect*, which reviewed all of the then existing studies on the correlation between physical features and measures of intelligence. Most of the correlational studies were based on rather small samples, and as the correlations between physical measures and IQ are typically small, they were usually nonsignificant statistically. Paterson simply compared the number of significant and nonsignificant correlations and usually concluded that the null hypothesis could not be rejected. His conclusions of essentially "no physical correlates of IQ" have become a dogma in psychology textbooks, and the vast majority of psychologists even today will tell you, for example, that there is no correlation between head size or brain size and IQ. As I generally doubted many of Paterson's conclusions, I decided to review all of the studies of physical correlates done since 1930 and, when possible, to combine the results of various studies by the methods of meta-analysis. The result was that the null hypothesis (i.e., no correlation) could be rejected at high levels of confidence for most of the physical characteristics that had been examined in relation to IQ; these include body size, head size, brain size, blood types, ocular characteristics, and other anatomical and physiological variables (341). The significant correlations between psychometric scores and such a wide variety of physical traits argues forcefully that the population variance on standard mental tests, such as IQ, reflects latent traits that are profoundly enmeshed with organismic variables in complex ways.

An innovative feature of my meta-analytic review was that, where possible, it examined three different types of correlation of a given physical trait with IQ: (i) the correlation within individuals (WI), (ii) within families (WF), and (iii) between families (BF). This methodology,

based on sibling data (202), is an analytically important tool that helps determine the probable cause of the observed correlation. For example, failure to find a WF correlation, even when there is a significant WI correlation in the general population, rules out pleiotropy (i.e., two or more distinct phenotypic characteristics being the result of the same gene). Height and IQ show a WI (and BF) correlation, but they do not show a WF correlation (200). Head size and IQ show a WF correlation (358), as do myopia and IQ (299), suggesting that these two physical traits are pleiotropically related to IQ. These findings aid the search for the specific gene loci responsible for variance in IQ or g and may also provide clues to the precise physical basis of IQ variance.

The Methods of Correlated Vectors. IQ is highly g -loaded, but it is typically saturated with other factors as well. To determine whether a given nonpsychometric variable is related to g per se, rather than to any other factors or specific sources of variance in test scores, I invented the method of correlated vectors. Essentially, it consists of factor analyzing a large psychometric battery of highly diverse subtests to obtain the g loadings of each subtest. This column vector of the subtests' g loadings is termed V_g . Each subtest is then correlated with some non-psychometric variable, X . The column vector of these correlations is V_x . Controlling for differences in the subtest reliabilities (by disattenuating or partialing out the subtests' reliability coefficients), a significant correlation between the parallel column vectors V_g and V_x shows that g and X are related. It tells us that the larger a subtest's true g loading, the larger is its correlation with variable X .

I have examined a number of variables (X) by this method. The correlation between V_g and the various measures (i.e., V_x) is shown in brackets: spouse correlation [.90]; heritability [.60-.80]; inbreeding depression [.80]; cerebral glucose metabolic rate [-.79]; brain intracellular pH [.63]; head size [.60-.70]; choice and discrimination RI [.70-.80]; average evoked potential habituation amplitude [.80]; and AEP waveform complexity [.95]. All of these correlations are significant; the particulars on the studies of each variable are given in (226, 258, 282, 356, 383 [Chapters 6-9]). No other factor shows anywhere near the same degree of relationship to non-psychometric variables as does g . My research shows conclusively that psychometric g , far more than any other factor, reflects individual differences in certain biological and developmental properties of the brain that govern its speed, consistency, and capacity for information processing. Though manifested overtly in many ways that can be described in behavioral terms, g itself cannot be described or explained in behavioral or psychological terms. The g factor per se does not reflect any particular achievements, knowledge, or skills, but rather the information processing capacity for acquiring and using the knowledge and skills necessary for achievement.

I have pointed out a crucial conceptual distinction, namely, that the construct (in this case g) and the vehicle used for measuring the construct (in this case, a psychometric test and the scores it yields) are not one and the same; they are conceptually and empirically distinct. Though the rank order of individuals' scores on any highly g -loaded test can be accounted for largely in terms of individual differences in the level of g , the absolute level of the individuals' raw scores on any

such test also reflects the particular composition of the test items (332). This fact has important consequences for the interpretation of test scores and the secular trend in the population mean for any particular vehicle of g (319, 368, 383, Chapter 10).

In addition to showing that g is correlated with various biological variables, I have also amassed empirical evidence (based largely on the method of correlated vectors) to show that it is g itself that accounts for most of the practical predictive validity of tests used in educational placement and selection and in personnel selection in industry and the Armed Forces. When the validity coefficient is based on a multiple correlation, typically the increment in predictive power contributed by all other factors (and by test specificity) independent of g is remarkably small (383, Chapter 9).

Future Directions

I see basic research on human mental ability, particularly g and the major group factors, as advancing in each of two directions, which I think of as the horizontal and the vertical. Both are necessary and each can be scientifically rigorous.

Horizontal research on g explores the whole nexus of behavioral, social, and economic correlates and consequences of individual and group differences in the level of g. I believe g plays a greater role in these spheres than most educators, sociologists, criminologists, economists and social policy analysts presently realize. But serious consideration of this probability seems to be strongly resisted in some circles. The generally nihilistic reaction of the mass media to *The Bell Curve* by Herrnstein and Murray (1994), which, more than any previous scholarly work, examined the relationship between g and a number of social variables of national concern, is a case in point. It is a reasonable supposition that in the global economy and the competitive technological and information-intensive world of the twenty-first century, a nation's chief natural resource will be its population's overall level of educability, in which the distribution of g-loaded abilities will inevitably be a major determining factor. Researching the extent and the ramifications of the g factor in the nexus of societal variables is the province of a budding new field named the "sociology of intelligence" by sociologists Robert Gordon and Linda Gottfredson. (See the a special issue of *INTELLIGENCE*, 1997,24, No. 1, for example.)

Vertical research digs down in search of the causal basis of g. Being analytical and reductionistic by nature, I personally find this is the more interesting aspect and the one to which I expect to devote my efforts in the future. By definition, an underdeveloped field is one in which many of the findings, and even some of the classic experiments, have not been replicated and many of the supposed facts not fully consolidated. I am happy therefore to see research on "mental speed" in relation to psychometric g being actively pursued in a number of laboratories around the world. The new information that I see coming in, almost every month, is most valuable. However, there is still confusion, contradiction, and many unanswered questions. More standardized apparatus and procedures are called for (as the same standardized reagents are used in every chemical

laboratory) and much more importance must be accorded to replicating the theoretically crucial findings across different laboratories. The measurement of individual differences in g by means of mental chronometry is as close to the interface between brain and behavior as we are likely to come. The consolidation of the knowledge gained at this interface is important for vertical advancement, that is, identifying the basis of g in the structural and functional features of the brain itself.

A few hypothesis-generating steps have already been taken by showing g-correlates of direct brain measurements obtained with evoked potentials, magnetic resonance imaging (MRI), positron emission tomography (PET scan), and intracellular brain pH levels. Many researchers in the neurosciences, however, have ignored g as a subject for brain research, mostly, I fear, because a crucial distinction has not been made sufficiently clear.

In recent articles (374, 384), I have emphasized the distinction between (i) the neural circuitry or design features of the brain possessed by all neurologically intact members of a species that are responsible for that species' characteristic behavioral capacities, and (ii) the properties of the brain of a given species that cause intraspecies variation (i.e., individual differences) in that species' characteristic behavioral capacities. We know from research in behavior genetics that intraspecies variation in many behavioral capacities is not entirely the result of experiential differences and learning. But I have found no good reason to believe that the design features of the brain (which are undoubtedly crucial determinants of interspecies variation in behavioral capacities) are necessarily involved in intraspecies variation. The latter may well be due to an entirely different set of causes than neural circuitry or other design features of the brain, but rather involve such within-species factors as: differences in blood supply (via the richness of the capillary network), the degree of myelination of axons (which affects nerve conduction velocity), the neuroglial cells (which nourish neurons), the brain chemistry of neurotransmitter (which affect synaptic transmission), and individual differences in the number of neurons involved in the various brain modules. We now know quite conclusively from MRI studies, for example, that IQ is correlated with brain size, but we still don't know what precisely it is about brain size that causes this correlation.

All but an exceedingly few neuroscientists today are interested in intraspecies variation in behavioral capacities. They may well find discovering the brain's general operating principles daunting enough, without having to explore the causes of individual variation in the functional efficiency of the essential design features of the brain and their general operating principles. As Francis Crick (1994) has pointed out, neuroscience cannot yet explain even how the human brain sees things in the environment, much less how it performs the complex functions we call intelligence. The very existence of the g factor (like all other psychometric factors) is only revealed by examining intraspecies individual differences in each of the broad and diverse class of functions we regard as constituting intelligence -- discrimination, generalization, learning, memory, insight, abstraction, problem solving, and the like. But before we can begin to research the physical basis of g, do we first need to discover all of the brain's design features that make

these functions possible? I don't think so. The question of what causes the various cognitive functions of the brain to be positively correlated is a very different question from that of understanding the specific operating mechanisms of each of these functions.

As a heuristic proposition to encourage research in this "vertical" search for the neurological causes of g, I propose the following working hypothesis: Individual differences in human behavioral capacities do not result from differences in the brain's structural operating mechanisms per se, but rather are the result of other aspects of cerebral physiology that modify the sensitivity, efficiency, and effectiveness of the basic information processes that mediate the individual's responses to certain aspects of the environment.

I'm placing my bets on the search for those aspects of brain physiology responsible for g as most likely to generate the next path-breaking discoveries in differential psychology and human biology. I have been told by experts that the technology to do this already exists. So, looking ahead, I see my principal endeavor to be sparking the interest of qualified scientists in the brain sciences and helping them solicit the necessary resources to pursue this "vertical" investigation of g.

A New Twist on Jensenism by ALAN S. KAUFMAN, Yale University School of Medicine

Jensenism is redefined, not in terms of his notions about the genetics of intelligence, but in terms of the personal qualities and beliefs that have made Jensen a researcher of note: going against convention, tackling controversial topics with empiricism, refusing to be intimidated by threats and picket lines, and being flexible enough to modify his beliefs. These aspects of Jensen are illustrated by the author's personal experiences with the man and his research.

My own, personal dictionary, not to be found in any bookstore or publishing house, has a different definition of Jensenism, one that more accurately portrays the man and his work:

Jensenism, n. (1) the art of going against the grain of conventional psychological wisdom; (2) the belief that no topic is too holy or taboo to reside beyond the grasp of scientific, empirical inquiry; (3) the ability to remain steadfast in one's beliefs--sometimes with a touch of arrogance--despite threats, accusations, denunciations, and attacks; (4) the flexibility to allow one's own strictly held beliefs to be overturned by new empirical discoveries; after Arthur R. Jensen (born 1923), U.S. educational psychologist, who has practiced each of these tenets during his impressive research career [1955-present].

I have long been an admirer of Arthur Jensen's approach to research. I disagree with some of his conclusions, especially those concerning genetics and race differences, but I applaud his commitment to the scientific process. And, quite simply, the man is brilliant.

I remember when I first came face-to-face with Jensen's brilliance. The Journal of Special Education had organized a special issue in 1984 devoted to the controversial test that I co-authored with my wife Nadeen, the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983). Many luminaries in psychology were invited to write articles about some aspect of the K-ABC, and I was asked to read through all of the articles and write a rebuttal article. The package of 13 articles arrived at my home just before I was to drive to the airport for a cross-country trip. I took the package with me and spent the next five hours reading each article and feverishly taking notes for my rebuttal. Though the group of contributors included Anne Anastasi, J.P. Das, and Robert Sternberg, among others, I had a good feeling as I read through the first dozen articles. I was not worried about rebutting the key points made by the various authors; I was feeling confident, even a bit cocky.

Then I got to Jensen's article, which was at the bottom of the pile. As I began to read his criticisms of the K-ABC, I began to sweat. One line from a movie kept weaving in and out of my consciousness: As the Sundance Kid (Robert Redford) and Butch Cassidy were being pursued by some relentless unknown enemies, Sundance asked repeatedly, "Who are these guys?" As I read page after page of Jensen's insightful critique, involving cognitive complexity, Spearman's hypothesis, and indifference indicators, I kept subvocalizing the words, "Who is this guy?" Of course, I knew quite well who he was; it just never occurred to me that he was so familiar with my work and that he would start his attack with smoking guns. The other authors wrote articles filled with text, opinion, and sometimes emotion. Jensen buttressed his text with original data analyses that occupied four new tables and six new figures. He used these analyses to challenge and provoke, to some extent, but mostly to inquire, to seek the truth.

He used the K-ABC subtests to assess the validity of Spearman's hypothesis (i. e., the notion that the magnitude of black-white differences in a set of tasks is positively correlated with the tasks' g loadings). He obtained a correlation of .58 for the 13 K-ABC sub-tests, virtually identical to the value of .59 for a larger group of 121 cognitive tasks (Jensen, 1984), impelling him to conclude that "the K-ABC tests cannot be regarded as at all atypical; they conform to Spearman's hypothesis at least as well as many other tests" (p. 395). That finding supported his overall perspective about the K-ABC, and he might have left it at that. But he proceeded to point out a finding that was opposite to his arguments: "The regression line for the K-ABC tests. . .falls significantly below the regression line. . .for all 121 tests. . . .That is, the K-ABC tests show considerably smaller differences than would be predicted from their g loadings. This phenomenon poses what may be the major puzzle of the K-ABC" (Jensen, 1984, p. 395). And, indeed, Jensen enjoys solving puzzles. He delighted in formulating thought-provoking hypothesis after hypothesis to attempt to solve this puzzle. I disagreed with most of his ruminations, on Spearman's and other hypotheses, citing data or facts that I perceived to be contrary to his notions (Kaufman, 1984). Yet, I couldn't help but tip my hat to his objectivity and insight: "The tactics for writing the articles. . . vary quite a bit, ranging from the brilliant, data-based, meticulous critique of certain key aspects of the K-ABC expounded by the noted Arthur Jensen [to the emotional responses of some others]" (Kaufman, 1984, p. 410).

About a year after being so thoroughly impressed by Jensen's empiricism, wisdom, and sense of fairness, I had the chance to see him in action, and get to know him personally, at the 1984 American Psychological Association meeting in Anaheim. Jensen was giving a paper on several topics that included Spearman's hypothesis, his K-ABC research, and black-white differences in IQ and achievement. The media, naturally, was not far behind, and a circus atmosphere developed, with reporters, picketers, video cameras, and security guards everywhere. Jensen was escorted into the large, packed room by the guards and he showed not the slightest trace of intimidation. He began his address with blunt remarks about the large achievement discrepancies between blacks and whites, differences that were not explainable by simple environmental variables. I was taken aback by the directness of his statements and his interpretations on a topic that invariably invites hemming, hawing, apologetic statements, and back-stepping. I guess I shouldn't have been so surprised in view of his writings on the topic, but I had never heard him speak before and was expecting a small dose of political correctness. Instead, I witnessed something more akin to sublime self-confidence blended with in-your-face arrogance.

That evening, Nadeen and I joined Jensen, Cecil Reynolds, and one or two other psychologists for dinner. Our Son, James, then 10 years old and now a Ph. D. student of Robert Sternberg's at Yale, had been watching TV that afternoon and saw the demonstrations against Jensen the psychologist and threats against Jensen the man. James, out of fear, pleaded for us not to join Jensen for dinner, but settled for a solemn promise that we wouldn't sit too close to him. Dinner was thoroughly enjoyable as Jensen, though a bit uncomfortable with the spotlight, entertained everyone with tales of harassment and intrigue stemming from his notoriety. I recall him telling of a TV talk show host's duplicity; the host (I believe it was Mike Wallace) made Jensen look foolish when he changed the questions that actually aired from the actual questions that were asked during the taped interview.

I have always enjoyed Jensen's ability to revisit the old in psychology and come away with something new. His research on reaction time is excellent and thought provoking. A simple twist on Galton's initial tasks for measuring intelligence, long relegated to historical status within the field of psychology and long believed to be an "off target" attempt to measure cognitive ability, and Jensen was able to produce an apparently valid measure of IQ. A sophisticated empirical treatment of the g factor, likewise dismissed by mainstream psychology as a concept that is primarily of historical importance, and Jensen re-established g as an invariant construct of potential value. One might disagree with the meaningfulness of g and dispute the theoretical basis or practical utility of the g factor, but the quality of Jensen's research on the general factor demands that his findings and conclusions not be taken lightly or dismissed cavalierly.

The net result of his research and writing on these formerly historical topics is to reinterpret history. Galton's original intelligence test focused on sensori-motor abilities and, though powerfully influential in the emergence of the IQ concept in the United States and Europe, Galton's test was ultimately declared invalid and was replaced by Binet's IQ test. Binet had the

insight to allow errors of measurement to invade the science of intelligence and relied conceptually on Spearman's g factor in providing a rationale for his choice of cognitive tasks for his battery. Subsequently, the g approach was replaced by Wechsler's multi-score instruments, and theories from Thurstone to Guilford to Horn that greatly downplay g; even the latest revision of the Stanford-Binet yields subtest and area scores and relies on a blend of Thurstone and Horn-Cattell as a theoretical foundation. But the careful research by Jensen on reaction time and the g factor forces historians and those involved in the clinical assessment of intelligence to rethink the contributions of Galton, Spearman, and Binet, and to realize that the early instruments may have been more on-target than initially believed. Galton, in particular, may have missed by a few inches instead of a few miles. Intriguingly, Jensen's research on reaction time and g is not only tied to the past; it also may provide a link to the future as assessment enters the computer-based stage of examining EEGs and CT scans for, potentially, increasingly objective measurement of intelligence (Eysenck & Barrett, 1985; Jensen, 1985).

As a trainer of school and clinical psychologists in intellectual assessment for a quarter-century, I have found some of Jensen's research and theorizing quite valuable. The research that impressed me for its simplicity, yet far-reaching implications, was his work on Wechsler's Digit Span (Jensen & Figueroa, 1975). So much had been written on the potential impact on intelligence test scores of environmental variables such as motivation and perseverance and of cultural variables such as the relevance of the stimuli used in test questions. Evaluating the importance of these variables is difficult because of their multifaceted complexity. Yet, Jensen's Digit Span research was ingenious because it effectively held these variables constant. Why would an examinee be more or less motivated or persevering when responding to Digits Forward versus Digits Backward, tasks that utilize the identical, culturally neutral stimuli? The research results that revealed quite different individual variation on the repetition of digits in the forward versus backward sequence were provocative and could not be easily dismissed by proponents of the key role of motivation or culture loading in accounting for group differences.

Jensen's hierarchical Level I--Level II theory of intelligence, simplistic as it is, provides clinicians with a valuable method for interpreting profile fluctuations when more conventional explanations (such as verbal--nonverbal) do not suffice. When interpreting intelligence test profiles, I have always considered it to be a mark of "intelligent testing" to be able to apply diverse theories as explanations for a child's or adult's subtest fluctuations (e. g., Kaufman, 1990, 1994). For the purpose of profile interpretation, complex theories are usually less practical or effective than simple theories for grouping subtests into alternative, relevant patterns that may reveal a person's cognitive strengths and weaknesses. Jensen's memory--reasoning dichotomy has proved to offer a useful alternative interpretive strategy for understanding a person's profile when the fluctuations in that profile suggest that the test's global scales cannot be meaningfully interpreted. For example, memory-reasoning sometimes fits the data better than Wechsler's Verbal-Performance split, the K-ABC's Sequential-Simultaneous division, or the Stanford-Binet IV's fluid-crystallized dichotomy. In view of the fact that of the alternative theories mentioned, only Jensen's is hierarchical, the application of Level I-Level II theory to profile interpretation adds an additional dimension to the mix, a dimension that sometimes has implications for

educational applications.

My own research disputes some aspects of Jensen's most controversial statements regarding the intellectual abilities of blacks versus whites. On the K-ABC, for example, one of the Achievement subtests is Faces & Places, a test of general information that uses a visual-vocal instead of an auditory-vocal format; thus, instead of responding orally to a question such as "Who is Martin Luther King, Jr.," the child must respond orally to a picture of Dr. King. This K-ABC subtest assesses range of general knowledge, as does Wechsler's Information subtest. Yet, unpredictably, the apparently culture-loaded Faces & Places subtest produces trivial black-white differences whereas Wechsler's information subtest yields among the largest racial differences observed on conventional intelligence tests (Kaufman, 1994; Kaufman & Kaufman, 1983). My interpretation is that the legacy of large racial differences has maintained when the tests have been the same old tests used since the time of Binet and World War I. When a new task is tried, even when it is an apparent shift of a kaleidoscope such as Faces & Places relative to Information, then the racial differences may disappear. In fact, the black-white difference was also small (as was the Hispanic-white difference) for adolescents and young adults on an adult analog of the general information task called Famous Faces (Kaufman, McLean, & Kaufman, 1995). Furthermore, a new fluid reasoning task called Four-Letter Words, clearly a Level II task from Jensen's system, also produced much smaller than predicted race differences for a large sample of adolescents and adults (Kaufman, Chen, & Kaufman, 1995). These findings reinforce the notion that the so-called "constant difference" of about one standard deviation between test scores of whites and blacks may be largely a function of the limited selection of traditional tasks that defined virtually all tests of intelligence from the past. Race differences on the new breed of intelligence tests that has proliferated in the past two decades, many of them theory-based, may not conform so closely to the findings of tasks from the Binet-Wechsler tradition.

Yet, despite my disagreements with some aspects of Jensen's research and writing, I remain steadfast in my admiration for his stubborn insistence that no topic is too holy to be scrutinized by empirical analysis; that no interpretation of data is too politically incorrect to permit a straightforward expression of one's scientific opinion; that threats and intimidation are not effective methods for thwarting creativity and expression; that some of the best inspirations for research can be found in the historical annals of psychology among discarded and disavowed ideas; and that one should be ready and willing to abandon strictly held beliefs if new, compelling data should come along to suggest that the old ideas may be wrong. To me, Jensen is the quintessential scientist.

Jensen and Intelligence by NATHAN BRODY, Wesleyan University

Jensen's Contributions to the study of intelligence are discussed. The paper considers his writing on the topic of racial differences in scores on tests of intelligence. The paper concludes with a

discussion of his research on the correlates of the g vector.

JENSEN AND RACE

". . . it is a peculiar sensation this double consciousness, this sense of seeing oneself through the eyes of others, of viewing one's soul by the rape of a world that looks on in amused contempt and pity. One ever feels his twoness -- an American, a Negro:..."

W.E.B. DuBois, *Souls of Black Folks*

This quotation, taken from a book published in 1903, is a doubly apt introduction to Jensen's work on race and intelligence, it reminds us of the effects of beliefs about racial differences on African-Americans who experience "the sense of seeing oneself through the eyes of others. . .by the tape of a world that looks on in amused contempt..." It is also descriptive of the perception of Jensen's work by many in the field of Psychology. Just as those he writes about are forced to see themselves through his lens, others see him through the lens of someone whose views about racial differences they may abhor or reject.

Jensen's contributions to an understanding of individual differences in intelligence extend far beyond a discussion of racial differences, but it is his work on race that often serves to define his contributions. Therefore, a discussion of his work on race is an apt beginning to an evaluation of his overall contributions. Jensen (1974; 1977) published one of the best studies demonstrating that extremely poor schooling could result in a cumulative deficit in the intellectual functioning of African-Americans. He used a sibling control design to demonstrate that African-American children attending schools in the segregated south in the 1950s exhibited a cumulative decline in intelligence relative to the intelligence of their younger siblings. He also found that this effect was not present for African-American children attending schools in Berkeley, California. These studies are illustrative of Jensen's imaginative ability to obtain data that address a critical issue. Jensen's results are buttressed by an analysis of the consequences of deprivation of formal education associated with the decision of the Prince Edward County School Board in Virginia to avoid compliance with a court ordered desegregation plan (Green, Hoffman, Morse, Hayes, & Morgan, 1964). Green et al. found that African-American children who were deprived of the opportunity to attend public schools exhibited declines in intelligence of approximately six points per year for each year of deprivation of formal schooling. Jensen's results and the results of the Green et al. analysis are probably the two most convincing studies in the literature indicating that educational influences can reduce the intellectual functioning of African-Americans.

Robert Sternberg once wrote that he did not know why Jensen used his formidable psychometric knowledge and talent to address this particular issues (Sternberg, 1985). The choice of any of our research topics is mysterious and not illuminated by somewhat simplistic and reductionist analyses of political motives. I rather think, perhaps wrongly, that my interest in the field of

intelligence derives in part from a personal and moral imperative I feel that compels me to differ with Jensen with respect to his views on race and intelligence. Nevertheless, I believe that anyone who wishes to write about the issue of race and intelligence must acknowledge Jensen's formidable contributions to this topic and his comprehensive knowledge of this area of research. Jensen's book on bias in testing is an extraordinarily thorough and scholarly analysis of the issue of test bias (Jensen, 1980). I like to compare this book with another book that I admire greatly, Paul Meehl's monograph on Statistical vs. Clinical Prediction (Meehl, 1954). Both books serve to define the principal issues that must be understood in addressing the topics that they consider. Both books develop their arguments with unusual clarity and sophistication. And, to a remarkable extent, the conclusions reached in both books have stood the test of time and become part of the canon of empirically established generalizations that define our knowledge of important topics. Jensen established what is now close to the received wisdom of knowledgeable students of intelligence -- tests of intelligence are equally valid indices of the performance of individuals who differ with respect to their racial identification. In several technical senses of the term, they are not biased -- a conclusion endorsed in the recently published report of the American Psychological Association's task-force on intelligence composed of individuals with diverse views of the field (Neisser et al., 1996).

I do not agree with Jensen's argument, developed in great detail in his forthcoming book on g, that genetic differences contribute to differences in performance on tests of intelligence between African-American and other racially identified groups (Jensen, 1998). I believe that his argument in favor of a genetic hypothesis is not well grounded and I hope to publish an analysis of my reasons for not accepting his arguments. It is easy for those who know little about Jensen's views or the detailed analysis of research he presents in support of his views to dismiss his arguments out of hand. It is hard to dismiss his arguments (but I believe possible to do so) if one reads him carefully and is informed about the literature. I believe that the reasons for group differences in scores on tests of intelligence can not be ascertained from the available data. Whether a determination of the reasons for the group differences in scores would be theoretically or socially useful is hard to know -- it may depend in part on the reasons for the difference and what we can do to remediate the difference or to minimize its impact. And, whatever our differences may be about this issue, there is at least one belief about race and intelligence that we all share -- within group racial differences are larger than between group differences.

Race does not define a person's score on a test of intelligence (or, for that matter, any other characteristic other than race). I remember reviewing a paper by Jensen dealing with an analysis of the relationship between head circumference and the g vector that included data derived from two different racial groups (Jensen, 1994). In my review I noted that his discussion of his findings was not well-supported by his analyses and I suggested that he needed to rewrite his discussion to present a somewhat more cautious and weaker conclusion than he had presented. Jensen, on this occasion, agreed with me, and wrote a very generous letter to the editor of the Journal thanking me for my suggested recommendations and changed the article to reflect my criticisms. I think that this episode is illuminating. Jensen is not an ideologue or a person who is not able to respond to criticism in a fair way. He is a scientist with formidable technical skills

who strives for an understanding of the topics that he addresses. In this regard, his work is a model of scientific decorum. We should all strive to emulate his ability to test our beliefs against a recalcitrant reality that often is resistant to our ability to represent it in distorted ways. In the long run, if we are clever and honest, it will impose its structure and truth on us rather than ours on it.

"g" VECTORS

In my opinion, Jensen's most important contribution to the field is contained in his new book on the g factor (Jensen, 1998). In the first paper dealing with g, Spearman attempted to determine the g loadings of different measures of intelligence (Spearman, 1904). For much of this century, it has been understood that tests differed in their g loadings and there was a consensus about the kinds of tests that had the highest g loadings. Carroll's comprehensive re-analysis of the canon of correlation matrices derived from diverse measures of intelligence provides ample support for the proposition that tests with high loadings on gf have higher g loadings than other tests (Carroll, 1993). So, too, Marshalek, Lohman, and Snow's multidimensional scaling analysis of tests of ability demonstrates that tests with high loadings on gf such as the Ravens have higher g loadings than other tests (Marshalek, Lohman, & Snow, 1983). An examination of the contents and intellectual processes required for correct solution of tests that have high g loadings provides a basis for speculations about the nature of g.

Jensen (1998) has taken the analysis of g beyond the realm of metaphorical speculation. He derives g loading values for test batteries and then uses the vector of g loadings as a parametric index that can be related to other measures. These analyses provide a nomological network of laws and relations surrounding g that serves to specify the theoretical meaning of g construed as a hypothetical construct that is a variable component of different measures of intelligence.

Jensen (1998) links the g vector to several biologically relevant vectors. He notes that Pedersen et al. (1992) obtained heritability values for different tests in a battery of tests of intelligence administered to a sample of older Swedish adult MZ and DZ twins reared together and apart. The vector defining the heritability of the tests is correlated with the vector defining the independently ascertained g loadings, $r = .77$. Jensen provides additional evidence based on Wechsler sub-test g loadings indicating that the vector of g loadings is correlated with the vector of heritability values for Wechsler sub-tests.

Jensen reports other results indicating that the g vector is linked to biological indices. He analyzed data on head size and intelligence and obtained a vector for different tests of intelligence that represented the correlations between measures of head size and scores on different tests of intelligence (Jensen, 1994). This vector was correlated with the g loading vector. Head size is an imperfect index of brain size and the relationship between head size and intelligence indicates that intelligence is related to brain size. This establishes that the g vector is linked to a biological index of intelligence.

Jensen (in press) reanalyzed the data obtained from a French adoption study reported by Capron and Duyme (1989). This study used a complete cross-fostering design to study the effects of variations in social class background of biological and adopted parents on the IQ of adopted children. Previous analyses of these data indicated that children's IQ was influenced in an additive manner by the social class background of both adoptive and biological parents. The latter influence was found to be stronger than the former. Jensen obtained a vector defining the magnitude of the difference in Wechsler sub-test scores for adopted children reared in high and low social class families. He also obtained another vector defining the difference in sub-test scores of the Wechsler test for adopted children whose biological parents differed in social class background. This latter vector correlated with the vector defining g loadings for the sub-test scores, $r = .53$. The comparable correlation between the g loading vector and the vector of differences in sub-test scores defined by the social class background of an adopted child's adopted parents was .01. These data indicate that the nature of the influence of biological and adopted parents on an adopted child's IQ is different. The former influence varies with the g loading of the test and the latter influence does not, apparently influencing components of variance in an IQ test that are unrelated to g. This highly original analysis adds to the evidence suggesting that the g vector is a biologically influenced component of the variance in diverse measures of intellect and this analysis provides evidence that the nature of the influence on IQ of biological and adopted parents is both qualitatively and quantitatively distinct.

Jensen's analyses of the g vector also include studies relating the vector to vectors defining the predictive validities of sub-test scores on the Wechsler tests for measures of academic performance. He obtained correlations between g vector scores and the vectors of correlations between Wechsler sub-test scores and high school student's rank in class and college student's grade point average. The correlation with the g vector for the high school sample was .53 and the comparable correlation for the vector derived from the college student sample was .83. These analyses indicate that the predictive validity of a test of intelligence for a measure of academic success is related to the g loadings of the test.

Jensen's analyses of the correlates of g vectors provide the quantitative underpinning for what has long been apparent -- g is a biologically influenced heritable component of the commonality among diverse measures of intellect that is related to the ability of individuals to acquire knowledge in formal academic contexts. Perhaps we have always known this, but following Jensen's highly original use of analyses of the correlates of g vectors we know this with a kind of quantitative precision not heretofore available.

Jensen's work on the correlates of the g vector reveals some of his best attributes -- an ingenious ability to develop quantitative analyses that address fundamental issues in highly original ways that advance our knowledge of critical issues in the field.

Studies of Jewish Genetics and the Racial Double Standard: Is There a Hidden Agenda ?

BY PAUL GRUBACH

In an attempt to determine how the Jewish people differ from the non-Jewish world, Israeli scientists have conducted studies which show that Jews as a group differ significantly from non-Jews in a genetic-biological sense. 1 As we shall soon see, this information is apparently going to be used to discriminate against non-Jews.

What is even more interesting about these research projects is that they highlight the hypocritical double standard that is so deeply ingrained in certain segments of society. It's socially and morally acceptable for Jews to conduct such research projects. Anthropologist Roselle Tekiner suggested that queries into Jewish genetics may be motivated by a desire to "justify" and bolster Zionist nationalism; the idea of a "Jewish race" with a special set of "Jewish genes" could serve to unite world Jewry. 2 There is no highly visible, widespread public condemnation of these inquiries, which there would be if others were to conduct similar studies. Indeed, Jewish Zionists and their Gentile supporters would probably be the most vocal of all protestors if, for example, it were found that German or British scientists were attempting to determine how Nordics differ from Jews and Blacks in a genetic-biological sense, and this information would be used to implement racially discriminatory policies.

Dr. Jared Diamond Enter Dr. Jared Diamond, a prominent Jewish scientist and columnist for NATURAL HISTORY. He recently hailed GENES, PEOPLES, AND LANGUAGES, the new book by Professor Luigi Cavalli-Sforza, a population geneticist, for allegedly dismantling the idea of race.

In his books, Cavalli-Sforza himself promotes the following beliefs. The classification of humans into races has proved to be a futile exercise, and his research will lead to the elimination of alleged "racism," because he has discredited the popular assumption that there are clearly defined races. 3

In the NEW YORK REVIEW OF BOOKS, Diamond salutes Cavalli-Sforza for "demolishing scientists' attempts to classify human populations into races in the same way that they classify birds and other species into races." 4 Apparently, Jewish scientist Diamond operates with a hypocritical double standard.

In an article that appeared in NATURAL HISTORY, Diamond discussed the genetic studies on how Jews differ from non-Jews. He made this astounding statement: "There are also practical reasons for interest in Jewish genes. The state of Israel has been going to much expense to support immigration and job retraining of Jews who were persecuted minorities in other

countries. That immediately poses the problem of defining who is a Jew." 5

The implication here is obvious. The Zionist elite is planning to refuse a person the right to settle in Israel if they do not have "Jewish genes." With this in mind, consider point #4 of the Nazi Party program of May 25, 1920. It reads: "None but members of the nationality may be citizens of the state. None but those of German blood, irrespective of religion, may be members of the nationality." 6 In contemporary terms, only those with "German genes" could be citizens of Nazi Germany. I can't emphasize enough that this is similar to the type of Israeli policy that Diamond describes.

Diamond opposes classifying human populations into races--except of course populations of Jews and non-Jews. He apparently has given his silent assent to the proposed Israeli-Zionist policy of defining and classifying Jews and non-Jews on the basis of whether or not they possess "Jewish genes."

But just as importantly, the reader should note how Diamond's double standard in regard to racial classifications serves the interests of organized Jewry; it tends to undermine a sense of racial awareness and racial unity among Blacks, Arabs, Orientals, and especially non-Jewish Europeans, while simultaneously, it fosters Jewish national sentiment and consciousness.

Jewish Genetic Superiority? New DNA-based research suggests a genetic link between Jews and Middle Eastern people. Jews largely retained their genetic identity, one that was formed in the Middle East, according to a recent study published in the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. 7

Even after centuries of exile, Diaspora Jews remained closer to each other and more similar to Palestinians, Syrians and Lebanese, in terms of measured genetic characteristics, than to people in their host countries such as the European nations, the study says. 8

Based upon this DNA-based research, the study found that despite the many centuries their ancestors had spent in exile in different parts of the world, the Israeli Jews in the sample had the closest genetic links. Next in genetic affinity to Jews were Palestinians and Syrians, followed by other Middle Eastern ethnic groups. Jews of European descent living in Israel have closer genetic affinity to Syrians than to the non-Jews of the countries they came from. 9

We live in a society in which any manifestation or hint of racism brings forth numerous and high profile condemnations --except of course when the racist ideas and practices serve the interests of organized Jewry and its Zionist ideology.

Once again, the reader should note how the new study's findings dovetail so nicely with the ideology of Zionism. One of its standard tenets is that Jews, for 2,000 years were dispersed

among the nations of the world, and then decided to return to the land of their ancestors in the Middle East. Jews have a religious attachment to the land of Israel, which finds its roots in Biblical tradition.

Lo and behold! Here are new genetic findings which may be used to "justify" and "legitimize" these standard tenets of Zionist ideology. Zionist functionaries might now say: "Jews are not alien invaders on Palestinian territory. Genetic studies show that modern day Jews can trace their ancestry back to the land of Israel. Jews have a right to return to the land of their genetic ancestors."

One of the premises upon which Israel was built is that the Jews are a people--one people. 10 Jews throughout the world are more united with each other than they are with their non-Jewish countryman they may live with. 11 Lo and behold again! Notice how the findings of this new study could be used to bolster these beliefs. Supposedly, Jews from various parts of the world have a closer genetic affinity to each other than to the non-Jews of the countries they came from.

Of course, just because these studies of Jewish genetics may be politically motivated and their findings may dovetail with Zionist ideology, this in no way invalidates the findings. That is to say, maybe Jewry did originate in the Middle East and maybe contemporary Jews do in fact share a greater genetic affinity with each other than to the Gentiles they reside next to. Nor am I condemning such genetic studies. Quite the contrary. Scientists should perform more of these racial studies--without the hypocritical double standard that surrounds them.

But if this be the case, let no one complain when these same findings can be used to bolster a white nationalist agenda. Indeed, one of the implications of these Jewish genetic studies is that Jewish people are somewhat different in a genetic sense from the Europeans they reside next to. In other words, not only is organized Jewry an alien cultural entity within Western civilization, they are also somewhat alien in a biological sense.

Let the Western intelligentsia rid themselves of this hypocritical racial double standard and seriously consider the idea that genetic differences between Jews and non-Jews have significant sociopolitical consequences.

FOOTNOTES

1. NATURE, March 21, 1985, p.208.

2. Roselle Tekiner, Samir Abed-Rabbo, Norton Mezvinsky, eds., ANTI-ZIONISM: ANALYTICAL REFLECTIONS (Amana Books, 1988), pp.63-89.

3. L.L. Cavalli-Sforza, P.Menozzi, A. Piazza, THE HISTORY AND GEOGRAPHY OF HUMAN GENES (Princeton University Press, 1994).
4. See NEW YORK REVIEW OF BOOKS, April 13, 2000, p.61.
5. NATURAL HISTORY, November 1993, p.12.
6. See Robert Vexler's GERMANY: A CHRONOLOGY AND FACT BOOK: 1415-1972.
7. THE PLAIN DEALER (Cleveland), May 10, 2000, p.6-A.
8. Ibid.
9. Ibid.
10. See Rabbi Elmer Berger's discussion in Tekiner, Abed-Rabbo, Mezvinsky, pp.11-14.
11. See Anthropologist Tekiner's discussion of this in Tekiner, Abed-Rabbo, Mezvinsky, p.77.

Indoctrination and Group Evolutionary Strategies: The Case of Judaism

by Kevin MacDonald in "Indoctrinability, Ideology, and Warfare: An Evolutionary Perspective" edited by Eibl-Eibesfeldt and Frank Kemp Salter, 1998.

Indoctrination is a phenomenon that occurs within groups and, as a result, raises fundamental evolutionary questions regarding the relationship between the individual and the group. It has long been apparent to evolutionists that highly cohesive, altruistic groups would outcompete concatenations of individualists. The purpose of this chapter will be to develop the idea of a group evolutionary strategy and to support the contention that indoctrinability is an adaptation that facilitates the development of such groups. With few exceptions, the data relevant to these theoretical interests will be drawn from historical and contemporary Jewish communities.

For purposes of this chapter, a group is defined as a discrete set of individuals that is identifiably separate from other individuals (who themselves may or may not be members of groups). Groups become interesting to an evolutionist when there are active attempts to segregate the group from the surrounding peoples, a situation that results in what Erikson termed "cultural pseudospeciation". Creating a group evolutionary strategy results in the possibility of cultural group selection resulting from between-group competition in which the groups are defined by culturally produced in-group markings. Theoretically, group strategies are underdetermined and unnecessary. A group evolutionary strategy may be conceived as an "experiment in living" rather than the outcome of natural selection acting on human populations or the result of ecological contingencies acting on universal human genetic propensities.

In the case of Jews, in traditional societies there was a wide range of actively sought marks of separateness from surrounding peoples. Factors facilitating separation of Jews and Gentiles have included religious practice and beliefs; distinctive languages, such as Yiddish, Hebrew, and Ladino; mannerisms (e.g., gestures); physical appearance (hair styles) and clothing; customs (especially the dietary laws); occupations that were dominated by the group; and living in physically separated areas that were administered by Jews according to Jewish civil and criminal law. All of these practices can be found at early stages of the diaspora, and in the ancient world there were a large number of prohibitions that directly limited social contacts between Jews and Gentiles, such as the ban on drinking wine touched by Gentiles or the undesirability of bantering with Gentiles on the day of a pagan festival in the Greco-Roman world of antiquity. Perhaps the most basic badges of group membership and separateness, appearing in the Pentateuch, are circumcision and the practice of the Sabbath.

Given this actively sought separation, there is the possibility that there will be genetic differences between Jewish and Gentile populations that are maintained over long stretches of historical time. There is considerable evidence for gene frequency differences between Jewish populations and populations they have lived among for centuries. Moreover, there is little doubt

that over long stretches of historical time there was little genetic admixture, due to the functioning of the segregative mechanisms described previously but also due to negative attitudes regarding intermarriage and proselytism.

A dispersed group that actively maintains genetic and cultural segregation from surrounding societies must develop methods to ensure social cohesion and prevent defection. Fundamental to Jewish group integrity over historical time have been social controls and ideologies that depend ultimately on human abilities to monitor and enforce group goals, to create ideological structures that rationalize group aims both to group members and to outsiders, and to indoctrinate group members to identify with the group and its aims.

Social controls on group members are central to group evolutionary strategies. Social controls can range from subtle effects of group pressure on modes of dressing to laws or social practices that result in large penalties to violators. Recently Robert Boyd and Peter Richerson have shown that punishment can result in the stability of altruism or any other group attribute. In the case of human groups, punishment that effectively promotes altruism and inhibits nonconformity to group goals can be effectively carried out as the result of culturally invented social controls on the behavior of group members. Thus, while it may well be that group-level evolution is relatively uncommon among animals due to their limited abilities to prevent cheating, human groups are able to regulate themselves via social controls so that theoretical possibilities regarding invasion by selfish types from surrounding human groups or from within can be eliminated or substantially reduced.

Facilitating altruism by punishing nonaltruists can be viewed as a special case of the general principle that social controls can act to promote group interests that are in opposition to individual self-interest. Group strategies must typically defend themselves against "cheaters" who benefit from group membership but fail to conform to group goals. Human societies are able to institute a wide range of social controls that effectively channel individual behavior, punish potential cheaters and defectors, and coerce individuals to be altruistic.

Besides social controls, group strategies also are typically characterized by elaborate ideological structures that rationalize group goals and behavior within the group and to out-group members. By far the most important form of such ideology in human history is what we term religion, and in the following it will be apparent that indoctrination into Judaism as a group evolutionary strategy involved the inculcation of religious beliefs that rationalized behavior essential to the group strategy.

Indoctrination into the Group Ethic of Judaism

Judaism has been able to retain a high level of group cohesion and within-group altruism over a long period of historical time, at least partly because of social controls acting within the group that served to penalize nonaltruists and noncooperators, while cooperative altruists were ensured

a high level of social prestige. Nevertheless, social controls do not appear to be the whole story. If only social controls were involved, Judaism or any similar group evolutionary strategy would be a sort of police state in which the only motivations for socially prescribed behavior would be fear of the negative consequences of noncompliance.

However, it is difficult to imagine that such a group would long endure, and, in any case, a salient feature of historical Judaism has been the indoctrination of individuals into psychological acceptance of group aims. One area of psychological research relevant to conceptualizing the role of indoctrination in group evolutionary strategies such as traditional Judaism is that of research on individualism/collectivism. Collectivist cultures place a high emphasis on the goals and needs of the in-group rather than on individual rights and interests. In-group norms and the duty to cooperate and submerge individual goals to the needs of the group are paramount. Collectivist cultures develop an "unquestioned attachment" to the in-group, including "the perception that in-group norms are universally valid (a form of ethnocentrism), automatic obedience to in-group authorities, and willingness to fight and die for the in-group. These characteristics are usually associated with distrust of and unwillingness to cooperate with out-groups".

Socialization in collectivist cultures stresses group harmony, conformity, obedient submission to hierarchical authority, and honoring parents and elders. There is also a major stress on in-group loyalty as well as trust and cooperation within the in-group. Each of the in-group members is viewed as responsible for every other member. However, relations with out-group members tend to be "distant, distrustful, and even hostile". In collectivist cultures morality is conceptualized as that which benefits the in-group, and aggression towards and exploitation of outgroups are acceptable.

As with all collectivist cultures, Judaism depends on inculcating a powerful sense of group identification. Triandis proposes that identification with an in-group is increased under the following circumstances: membership is rewarding to the individual; in-groups are separated by signs of distinctiveness; there is a sense of common fate; socialization emphasizes in-group membership; in-group membership is small; the in-group has distinctive norms and values. In addition, evolutionists have emphasized that socialization for in-group membership often includes an emphasis on the triggering of kin recognition mechanisms (such as references to the kinship nature of the group; e.g., "fatherland"; "the Jewish people") and phenotypic similarity (such as similar dress and mannerisms). Operant and classical conditioning are often used, as when individuals are publicly rewarded for group allegiance and altruism.

All of these mechanisms have undoubtedly been present within historical Jewish communities. I have noted the prevalence of external signs of separateness from Gentiles among Jews in traditional societies, including language, clothing, and mannerisms. In the present context, these signs serve to enhance the phenotypic similarity of the in-group and mark off a distinctive set of in-group norms and values. Moreover, the goal of education in traditional societies was to

promote the consciousness of separateness from out-groups and a sense of common fate among widely dispersed Jewish groups stretching forward and backward in historical time.

These trends can be seen clearly in historical Jewish communities as well as among contemporary Hasidic and Orthodox Jewish groups. Kamen notes that the Hasidim are concerned about contamination from the secular culture and work very hard to minimize their children's contact with or even awareness of the wider culture. Similar to all Jewish societies prior to the Enlightenment, there are a great many markers of in-group status, including speaking a Jewish language (in this case, Yiddish), distinctive modes of dress, and distinctive Jewish names. A young Hasidic man commented that "I call my clothing a personal weapon because if I am tempted to do something which by law is not right, one look at myself, my hat, my coat, my tsittsis reminds me who I am. Nobody is there to see except me, and believe me that's enough". The last part of the quote is particularly significant: this individual is clearly following the law not because of fear of negative sanctions by the community, but because he completely accepts the psychological desirability of doing so.

Education is of course extremely important, but a major goal in the Hasidic community is group enculturation rather than imparting subject matter. Television and other means of integrating with the wider culture are forbidden so that the child is simply not exposed to these influences. In addition, there are numerous holidays that are utilized in the school curriculum as a means of discussing particular events important in Jewish history or religious practice.

Critical to Jewish indoctrination have been practices whereby, from a very early age, individuals are placed in situations where group activities involve positive experiences of great emotional intensity. These experiences are perhaps analogous to the phenomenon of "love-bombing" as an aspect of indoctrination in religious cults, except that this type of indoctrination begins at an early age and continues throughout life. In the traditional shtetl communities of Eastern Europe, beginning at birth children were socialized not simply as an individual or as a family member but as a member of the entire community. The child's birth was celebrated by the entire community, and there were special roles for children in a variety of religious events. Thus at the Passover celebration, the youngest child asks the Passover questions, "quivering with excitement". The elaborate ceremony functions to make the child very aware of the intimate connection of the child to the family and the family to the wider group of Jews extending backward in historical time. Another holiday, Lag ba Omer, is given over entirely to the pleasures of children, and a prominent part of Hanukkah is when children go around to relatives to receive money. The boy's bar mitzvah is fundamentally a ceremony marking the child's new relationship to the group.

Positive group experiences continue into adulthood. Among the Hasidim studied by Kamen, group meetings and positively valenced social events are common. There are weekly meetings of the males (the tish) at which the children participate in group singing. After the singing, there is a discourse on the Torah, followed by singing and dancing. Group dancing by males is

particularly striking and also occurs at weddings and other social events. The men join arms and dance together in an atmosphere of great joy and excitement -- a clear indication of the powerful, positive affective forces joining together members of the group. At these social events children are introduced in a very positive manner to group membership.

Synagogue services were also a positive group experience in traditional Jewish society. Zborowski and Herzog note the swaying and communal chanting as a prominent aspect of synagogue services in the traditional European shtetl communities: "The whole room is a swaying mass of black and white, filled with a tangle of murmur and low chantings, above which the vibrant voice of the cantor rises and falls, implores and exults, elaborating the traditional melodies with repetitions and modulations that are his own. The congregation prays as one, while within that unity each man as an individual speaks directly to God."

In addition to positive experiences that foster extremely positive attitudes toward the group, there are also negative sanctions on failure to conform to group goals. Conformity to group attitudes and behavior is an important aspect of social control in traditional Jewish communities. "A sense of correct behavior, Hasidische behavior, takes precedence over individual deviations. Indulgence in contrary behavior is not tolerated by the group; the majority acts quickly to reprimand any member whose demeanor reflects negatively on his comrades".

Mayer also describes elaborate mechanisms of social control within the Orthodox community that spring into action to oppose any sign of nonconformity, such as a yarmulke that is too small or too brightly colored or a hemline that is too high. Zborowski and Herzog, writing of traditional European shtetl societies, also document elaborate mechanisms that ensure conformity within the community. People are greatly concerned about the good opinions of others. Everyone knows everything there is to know about everyone else, and withdrawal and secrecy are seen as intolerable.

Indoctrination also involves negatively valenced procedures akin to hazing as emphasized in Salter's chapter in this volume. After bar mitzvah and for approximately seven years until marriage, the boys spend 16 hours per day with their peer group, including communal breakfast, communal ritual baths, communal studying and prayer. At this age, studying itself is done with a great deal of emotion. Accounts indicate considerable sleep deprivation and a great deal of pressure to perform well within the peer group. The boys/men of this age are expected to relate primarily to the peer group, and if a child spends too much time at home, his behavior reflects poorly on himself and his family.

Efforts to socialize children and adults to the group are also apparent in much less traditional Jewish groups. Judaism in contemporary American society is best viewed as a civil religion, and, perhaps because of the lessening prevalence of many of the traditional segregating mechanisms that have facilitated group cohesion over the centuries, the civil religion goes to great lengths to prevent group defection, especially by attempting to strengthen Jewish education. Those who do

defect are simply written off, and group continuity and integrity are maintained by a central core of highly committed individuals. Because of the assimilatory pressures from the surrounding society, great importance is placed on "the recognition of Jewish education as the most vital element in the preservation of the Jewish people".

Jewish identification is actively facilitated by encouraging trips to Israel by high school and college students, and, indeed, Elazar terms Israel "the central focus of American Jewish educational effort". Woocher notes that the trips to Israel are often overlaid with "mythic" overtones from Jewish history (e.g., visits to Holocaust memorials), and have as their goal increased commitment to a Jewish identification on the part of the visitors. The retreats function as a sort of religious experience that attempts to effect attitude change by removing participants from their normal lives; by emphasizing group-oriented activities and a sense of community, nostalgia and "specialness"; and by renewing commitment to group identification and group goals.

Social Identity Consequences of Indoctrination

As a prelude to developing an evolutionary theory of indoctrinability, I will first consider the expected consequences of the indoctrination practices described above in terms of social identity theory. Social identity theory proposes that individuals engage in a process whereby they place themselves and others in social categories. Clearly a major effect of the indoctrination procedures described above is to highlight the salience of in-group membership to those being indoctrinated. From the standpoint of social identity theory, there are several important consequences of this process.

The social categorization process results in discontinuities such that individuals exaggerate the similarities of individuals within each category (the accentuation effect). Thus, there is a psychological basis for supposing that, given the highly salient cultural separatism characteristic of Judaism, both Jews and Gentiles would sort others into the category "Jew" or "Gentile" and would exaggerate the similarity of members within each category. By this mechanism, people reconceptualize continuous distributions as sharply discontinuous; the effect is particularly strong if the dimension is of importance to the categorizer. In the case of intergroup conflict, the dimensions are in fact likely to be imbued with great subjective importance.

Moreover, the individual also places himself or herself into one of the categories (an in-group), with the result that similarities between self and in-group are exaggerated and dissimilarities with out-group members are exaggerated. An important result of this self-categorization process is that individuals adopt behavior and beliefs congruent with the stereotype of the in-group.

Social identity research indicates that the stereotypic behavior and attitudes of the in-group are positively valued, while out-group behavior and attitudes are negatively valued. Thus, the homogenization of the behavior of in-groups and out-groups has strong affective overtones, and

individuals develop favorable attitudes toward in-group members and unfavorable attitudes toward out-group members. In-group and out-group members are both expected to develop highly negative attitudes regarding the behavior of members of the other group and generally to fail to attend to individual variation among members of the other group. The in-group develops a positive distinctness, a positive social identity, and increased self-esteem as a result of this process. Within the group there is a great deal of cohesiveness, positive affective regard, and camaraderie, while relationships outside the group can be hostile and distrustful.

Social identity theorists propose that the primary affective mechanism involved in social identity processes is self-esteem and that, indeed, the need to achieve a positive self-evaluation via this social categorization process functions as a theoretical primitive. Individuals maximize the differences between in-group and out-group in a manner that accentuates the positive characteristics of the in-group. They do so precisely because of this (theoretically) primitive need to categorize themselves as a member of a group with characteristics that reflect well on the group as a whole and therefore on themselves individually. For example, Gitelman , describing Jewish identity processes in the former Soviet Union, noted that Jews developed a great curiosity about Jewish history "not merely from a thirst for historical knowledge, but from a need to locate oneself within a group, its achievements, and its fate. It is as if the individual's own status, at least in his own eyes, will be defined by the accomplishments of others who carry the same label. 'If Einstein was a Jew, and I am a Jew, it does not quite follow that I am an Einstein, but....'"

Further, people easily adopt negative stereotypes about out-groups, and these stereotypes possess a great deal of inertia (i.e., they are slow to change and are resistant to countervailing examples). Resistance to change is especially robust if the category is one that is important to the positive evaluation of the in-group or the negative evaluation of the out-group. It would be expected that people would be more likely to change their categorization of the hair color of out-group members on the basis of counterexamples of a stereotype than they would change their categorization of out-group members as stupid or lazy or dishonest.

The results of these categorization processes are group behavior that involves discrimination against the out-group and in favor of the in-group; beliefs in the superiority of the in-group and inferiority of the out-group; and positive affective preference for the in-group and negative affect directed toward the out-group. Although groups may be originally dichotomized on only one dimension (e.g., Jew/Gentile), there is a tendency to expand the number of dimensions on which the individuals in the groups are categorized and to do so in an evaluative manner.

Thus a Jew would be expected not only to sharply distinguish between Jews and Gentiles, but to come to view Gentiles as characterized by a number of negative traits (e.g., stupidity, drunkenness), while Jews would be viewed as characterized by corresponding positive traits (e.g., intelligence, sobriety).

A series of contrasts is set up in the mind of the shtetl child, who grows up to regard certain behavior as characteristic of Jews, and its opposite as characteristic of Gentiles. Among Jews he expects to find emphasis on intellect, a sense of moderation, cherishing of spiritual values, cultivation of rational, goal-directed activities, a "beautiful" family life. Among Gentiles he looks for the opposite of each item: emphasis on the body, excess, blind instinct, sexual license, and ruthless force. The first list is ticketed in his mind as Jewish, the second as goyish.

As expected, Zborowski and Herzog find that this world view was then confirmed by examples of Gentile behavior that conformed to the stereotype, as when Gentiles suddenly rose up and engaged in a murderous pogrom against the Jews. There was also a clear sense that the attributes of the in-group are superior qualities, and those of the out-group are inferior. Jews valued highly the attributes on which they rated themselves highly and viewed the characteristics of Gentiles in a negative manner. There was a general air of superiority to Gentiles. Jews returning from Sabbath services "pity the barefoot goyim, deprived of the Covenant, the Law, and the joy of Sabbath ...' We thought they were very unfortunate. They had no enjoyment ... no Sabbath ... no holidays ... no fun ...' 'They'd drink a lot and you couldn't blame them, their lives were so miserable.'"

The negative attitudes were fully reciprocated. Thorowski and Herzog note that both Jews and Gentiles referred to the other with imagery of specific animals, implying that the other was subhuman. When a member of the other group dies, the word used is the word for the death of an animal. Each would say of one's own group that they "eat," while members of the other group "gobble." "The peasant will say, 'That's not a man, it's a Jew.' And the Jew will say, 'That's not a man, it's a goy'".

There was thus a powerful tendency toward reciprocity of negative attitudes and stereotypes. Stories about the other group would recount instances of deception, and everyday transactions would be carried on with a subtext of mutual suspicion. "There is beyond this surface dealing, however, an underlying sense of difference and danger. Secretly each [Jewish merchant and Gentile peasant] feels superior to the other, the Jew in intellect and spirit, the 'goy' in physical force -- his own and that of his group. By the same token each feels at a disadvantage opposite the other, the peasant uneasy at the intellectuality he attributes to the Jew, the Jew oppressed by the physical power he attributes to the goy". While the documentation is not always as explicit as that provided in the case of Poland, there is a convincingly large body of evidence across numerous societies indicating that reciprocal hostility between Jew and Gentile tends to arise for most or perhaps all combinations of Judaism and Gentile socioreligious tradition (for Sephardic and Romaniote Jews, see Shaw 1991; for Sephardic Jews in Spain prior to the expulsion, see Neuman 1969/1942; for contemporary fundamentalist Judaism, see Heilman 1992).

An Evolutionary Interpretation of Social Identity Processes and Collectivism

The empirical results of social identity research are highly compatible with an evolutionary basis

for group behavior. Vine notes that the evidence supports the universality of the tendency to view one's own group as superior. Moreover, social identity processes occur very early in life, prior to explicit knowledge about the out-group. An evolutionary interpretation of these findings is also supported by results indicating that social identity processes occur among advanced animal species such as chimpanzees. Van der Dennen proposes, on the basis of his review of the literature on human and animal conflict, that advanced species have "extra-strong group delimitations" based on affective mechanisms. Among humans, one affective mechanism may well be the self-esteem mechanism central to social identity theory. Another positive emotion revealed by research on religious cults is the profound sense of relief that individuals experience when they join these highly collectivist, authoritarian groups. However, successful socialization into a highly cohesive group would also be expected to lead to feelings of guilt at the possibility of failure to conform to group goals. These latter mechanisms, although not considered by social identity theorists, would result in strong positive feelings associated with group membership and feelings of guilt and distress at the prospect of defecting from the group.

The powerful affective components involved in social identity processes are difficult to explain except as an aspect of the evolved machinery of the human mind. I have noted the powerful tendency to seek self-esteem via social identity processes as a theoretical primitive in the system. As Hogg and Abrams note, this result cannot be explained in terms of purely cognitive processes, and a learning theory seems hopelessly ad hoc and gratuitous. The tendencies for humans to place themselves in social categories and for these categories to assume immense affective and evaluative overtones involving the emotions of self-esteem, relief, distress, and guilt are the best candidates for the biological underpinnings of participation in highly cohesive collectivist groups.

Also, the fact that social identity processes and tendencies toward collectivism increase during times of resource competition and threat to the group suggests that these processes involve facultative mechanisms that emerged as a result of selection at the level of the group. As emphasized by evolutionists, external threat tends to reduce internal divisions and maximize perceptions of common interest among group members. This perspective is compatible with Wilson and Sober's proposal of group-selected psychological mechanisms that facilitate group goals on a facultative basis, i.e., in response to specific contingencies. Under conditions of external threat, there is an increase in cooperative and even altruistic behavior. I propose that external threat is a situation that elicits an evolved facultative tendency to identify more strongly with the group and to submerge individual interests to group interests. (As Wilson and Sober 1994 emphasize, such mechanisms do not imply conflict between individual and group goals: individuals engaging in altruistic or other types of group-oriented behavior may continue to monitor their individual self-interest. The point is that the group becomes the unit of selection.)

This perspective implies that the awareness of anti-Semitism would tend to foster a sense of group identity and social cohesion in the face of threat -- the "common fate" or "shared enemy" syndrome studied by psychologists. Feldman finds robust tendencies toward heightened Jewish

identification and rejection of Gentile culture consequent to anti-Semitism at the very beginnings of Judaism in the ancient world and throughout Jewish history. Historically, anti-Semitism and the perception of anti-Semitism have been potent tools for rallying group commitment and for legitimizing the continuity of Judaism.

A permanent sense of imminent threat appears to be common among Jews, and, as indicated above, such a threat would be expected to enhance commitment to the group. Writing on the clinical profile of Jewish families, Herz and Rosen note that for Jewish families a "sense of persecution (or its imminence) is part of a cultural heritage and is usually assumed with pride. Suffering is even a form of sharing with one's fellow Jews. It binds Jews with their heritage -- with the suffering of Jews throughout history." This comment indicates once again the importance of a sense of common fate and historical continuity to Jewish identification. Zborowski and Herzog note that the homes of wealthy Jews in traditional Eastern European shtetl communities often had secret passages for use in times of anti-Semitic pogroms, and that their existence was "part of the imagery of the children who played around them, just as the half-effaced memory was part of every Jew's mental equipment."

This evolved response to external threat is often manipulated by authorities attempting to inculcate a stronger sense of group identification. Thus Heller notes that a prominent feature of Soviet propaganda throughout its history was the inculcation of the belief that the Soviet Union was a "besieged fortress." "In a besieged fortress it is essential to fear and to hate the external enemy, who has surrounded the stronghold, is undermining the walls and threatening your 'home' and your life."

The inculcation of a siege mentality also appears to be an aspect of contemporary Judaism. Within this world-view, the Gentile world is conceptualized as fundamentally hostile, with Jewish life always on the verge of ceasing to exist entirely. "Like many other generations of Jews who have felt similarly, the leaders of the polity who fear that the end may be near have transformed this concern into a survivalist weapon". Thus, for example, Woocher notes that there has been a major effort since the 1960s to have American Jews visit Israel in an effort to strengthen Jewish identification, with a prominent aspect of the visit being a trip to a border outpost "where the ongoing threat to Israel's security is palpable".

Indeed, Jewish religious consciousness centers to a remarkable extent around the memory of persecution, including the holidays of Passover, Hanukkah, Purim, and Yom Kippur. Lipset and Raab note that Jews learn about the Middle Ages as a period of persecution in Christian Europe, culminating in the expulsions and the Inquisitions. There is also a strong awareness of the persecutions in Eastern Europe, including especially the Czarist persecutions. And recently, the Holocaust has assumed a pre-eminent role in Jewish self-conceptualization.

Given the importance of external threat in cementing group ties, complete acceptance by the Gentile community may be viewed negatively, or at least with ambivalence, by those interested

in maintaining group cohesion. One hears quite often of Jewish leaders in contemporary America expressing concern about being "loved to death," since complete acceptance may lead to intermarriage and a loss of Jewish identity. Perhaps as a result, American Jews tend to overestimate the actual amount of anti-Semitism. For example, Lipset and Raab describe survey results from 1985 indicating that one-third of a sample of affiliated Jews in the San Francisco area stated that a Jew could not be elected to Congress at a time when three of the four congressional representatives from the area were "well-identified" Jews, as were the two state senators and the mayor of San Francisco. Survey results from 1990 indicated eight out of 10 American Jews had serious concerns about anti-Semitism, and significant percentages believed anti-Semitism was growing even though there was no evidence for this, while at the same time 90 percent of Gentiles viewed anti-Semitism as residual and vanishing.

Also compatible with the proposal that individuals are more prone to submerge themselves in cohesive groups during times of external threat, there is evidence that the collectivist tendencies of Jewish communities became even more pronounced during periods of group conflict. For example, as was typical of traditional Jewish communities, there was an extreme level of conformity and thought control among Jews in the Ottoman Empire in the early modern period. The community regulated precisely every aspect of life, including the shape and length of beards, all aspects of dress in public and private, the amount of charity required of members, the numbers of people at social gatherings, the appearance of graves and gravestones, the precise behavior on Sabbath, the precise form of conversations, the order of precedence at all social gatherings, etc. The rules were enforced "with a kind of police surveillance," and failure to abide by the rules could result in imprisonment in community prisons, or, at the extreme, in excommunication. Although these practices occurred during a period of economic prosperity, these hyperconformist tendencies became even more extreme during a subsequent period of persecution and economic decline. While the above presents a static picture of the mechanisms related to group commitment, there may also be selection within the Jewish community over historical time for traits related to social identity and collectivism. As conceptualized by Triandis, individualism / collectivism is an individual-differences dimension, and it would appear that there are quite a few cases of individuals who are extreme on such a dimension to the point where defecting from the group is not an option. Especially striking has been the phenomenon of individuals who undergo martyrdom or commit suicide rather than abandon the group. We see examples periodically in modern times (such as the Jonestown massacre), and there are many historical examples, ranging from Christian martyrs in ancient times to a great many instances of Jewish martyrs over a 2,000-year period.

Recently there has developed a fairly large literature on religious cults with characteristics that illustrate the importance of social identity processes and that clearly place them on the extreme collectivist end of the individualism/collectivism dimension. These charismatic groups are highly cohesive, collectivist, and authoritarian. Within the group there is a great deal of harmony and positive regard for group members combined with negative perceptions of outsiders. Psychological well-being increases when the person joins the group, and individuals who disaffiliate experience psychological distress.

This affective motivation may be increased by personal feelings of threat prior to joining the cult. Many individuals who join cults are not satisfied with their lives and feel personally threatened -- a finding that I interpret as resulting from the triggering of collectivist mechanisms in a facultative manner as a response to external threat or simply from feelings of "not doing well" in life. Indeed, Galanter found that the individuals who experienced the greatest relief upon joining cults were those who were most distressed prior to joining, and case study material indicates that many of these individuals were experiencing economic, social, and/or psychological stresses (e.g., change of residence, being fired from a job, illness of relatives [1989a, 92]). Sirkin and Grellong found similar associations in their sample of cult members from Jewish families.

Jewish martyrdom and the extreme intensity of Jewish group commitment have long been apparent to historians. Johnson calls the Jews "the most tenacious people in history," but even this judgment seems inadequate. Jewish groups have persisted for centuries even though they have been isolated from other Jewish groups and subjected to persecutions, and even under circumstances where they were forced to engage in crypsis for many generations.

The suggestion is that among Jews there is a significant critical mass for whom deserting the group is not an option no matter what the consequences to the individual. Consider, for example, the behavior of groups of Ashkenazi Jews in response to demands made to convert during the disturbances surrounding the First Crusade in Germany in 1096. Jewish behavior in this instance was truly remarkable. When given the choice of conversion or death, a contemporary Jewish chronicler noted that Jews "stretched forth their necks, so that their heads might be cut off in the Name of their Creator.... Indeed fathers also fell with their children, for they were slaughtered together. They slaughtered brethren, relatives, wives, and children. Bridegrooms [slaughtered] their intended and merciful mothers their only children".

It is unlikely that such people have an algorithm that calculates individual fitness payoffs by balancing the tendency to desert the group with anticipated benefits of continued group membership. The obvious interpretation of such a phenomenon is that these people feel obligated to remain in the group no matter what, i.e., that there are no conceivable circumstances that would cause them to abandon the group, go their own way, and become assimilated to the out-group. As indicated above, selection at the level of the group need not imply that organisms do not attend to the individual costs of group membership. Nevertheless, the suggestion here is that many fully committed members of highly cohesive groups do not in fact have an algorithm that assesses the individual costs and benefits of group membership. Via indoctrination and/or selection processes for genes that predispose individuals to such behavior, it appears to be possible to produce extreme self-sacrifice in human groups.

While I do not suppose that such an extreme level of self-sacrifice is a panhuman psychological adaptation, it may well be the case that a significant proportion of Jews are extremely attracted

to group membership to the point that they do not calculate the individual payoffs involved. The proposed model is that over historical time average group standing on the trait of collectivism has increased among Jews because individuals low on this trait (in this case, individuals who do not conform to expected standards of group behavior) are more likely to defect voluntarily from the group or be forcibly excluded.

It has often been observed among historians of Judaism that the most committed members of the group have determined the direction of the group, and such individuals are likely to receive a disproportionate amount of the rewards of group membership. Moreover, Jordan notes that Jews who defected during the Middle Ages (and sometimes persecuted their former coreligionists) tended to be people who were "unable to sustain the demands of [the] elders for conformity." (The Sephardic philosopher Baruch Spinoza is a famous example of a nonconformist who was expelled from the Jewish community.) This trend may well have accelerated since the Enlightenment because the costs of defection became lower. Israel notes that after the Enlightenment, defections from Judaism due ultimately to negative attitudes regarding the restrictive Jewish community life were common enough to have a negative demographic effect on the Jewish community.

Moreover, in traditional societies there was discrimination within the Jewish community such that the families of individuals who had apostatized or engaged in other major breaches of approved behavior had lessened prospects for marriage. Writing of thirteenth-century Spain, Neuman notes that measures were taken to protect converts to Christianity from abuse by their former coreligionists. The interesting thing is that conversion was a blot on the family. The disgrace of one convert in a family was enough cause to warrant the disruption of the wedding engagement of an innocent relative. His former brethren regarded him as a renegade and ostracized him.

This type of social control in which individuals were punished on account of their relatives' contravention of group norms was common throughout Jewish history. Coitein, writing of medieval Islamic times, notes that the responsibility of the extended family was recognized by public opinion, although it was not a formal part of Jewish law. Hundert notes that in traditional Ashkenazi society the son of a convert was ostracized and ridiculed because of his father's apostasy, indicating that conversion had negative effects on the entire family even beyond the immediate generation. And Deshen describes a nineteenth-century Moroccan case in which a man was allowed to break an engagement with a woman whose aunt had given birth out of wedlock. The decision was based on a precedent in which a man was allowed to break an engagement with a woman whose sister had converted to Islam. To the extent that there is heritable variation for such nonconformity (and all personality traits are heritable [e.g., Digman 1990]), such practices imply that there will be strong selection pressures concentrating genes for group loyalty and social conformity within the Jewish gene pool.

There has probably always been cultural selection such that people who have difficulty

submerging their interests to those of the group have been disproportionately likely to defect from Judaism. Such individuals would have chafed at the myriad regulations that governed every aspect of life in traditional Jewish society. In Triandis's terms, these individuals are "idiocentric" people living in a collectivist culture, i.e., they are people who are less group oriented and less willing to put group interests above their own.

It is therefore likely that there has been within-group selection for genes predisposing people to collectivism to the point that they are simply incapable of acting selfishly based on estimates of individual payoffs of group membership. This hypothesis is supported by the finding that Jews have been overrepresented among non-Jewish religious cults. Galanter finds that 21 percent of the Divine Light commune, organized by Maharaj Ji, were Jewish despite the fact that Jews represented only 2 percent of the U.S. population. Moreover, 8 percent of Galanter's sample of members of the Unification Church of Reverend Sun Myung Moon were Jewish. This confirms the hypothesis that Jews have a stronger tendency toward collectivism in general. In addition, a large percentage of Jews are involved in specifically Jewish groups (including, I would suppose, the haredim, Orthodox Jews, and Conservative Jews in the contemporary world) characterized by many of the features (cohesion, collectivism, and authoritarianism) ascribed to religious cults. The milieu selecting for such characteristics was traditional diaspora Judaism, which was Orthodox.

It is interesting in this regard that highly committed Jews appear to seek out relatively small synagogues of relative ethnic homogeneity where there is a deep sense of group identification. The main purpose of these smaller synagogues seems to be to satisfy the need for close feelings of group identification -- what Mayer terms a "we-feeling" of shared intimacy in a group. Mayer describes a trend whereby those trained in Orthodox yeshivas seek out Hasidic synagogues as adults because of their greater feelings of group intimacy.

Further, Sirkin and Grellong found that cult members from Jewish families had a higher number of highly religious relatives than contrast Jewish families. This occurred despite the fact that the contrast Jewish families were actually more religiously observant than the families of cult members. These findings offer further confirmation of the hypothesis that cult membership is influenced by genetic variation: Jewish cult members come disproportionately from relatively unobservant families who nevertheless have a strong familial predisposition toward membership in highly collectivist groups. The relative lack of religious observance among these cult-involved families may have resulted from their greater tendency toward intellectual, cultural, and political activities that were seen as incompatible with traditional religious observance. However, these cultural activities failed to provide the psychological sense of intense group involvement desired by the children, with the result that they were prone to join religious cults

Conclusion

A clear message of the foregoing is that indoctrinability is a critical human adaptation that

enables the formation of highly cohesive groups. Group strategies are very powerful in competition with individual strategies within a society, as has been the case with Judaism. The power of the Jewish group strategy has derived from the following: (1) Judaism has been characterized by cultural and eugenic practices that produced a highly talented and educated elite that was able to improve the fortunes of the entire group; (2) universal Jewish education resulted in an average resource acquisition ability that was above that of the rest of the society; and (3) there were high levels of within-group altruism and cooperation.

Given the presence of a powerful group strategy within a society, there is the expectation that dynamic processes will develop between the strategizing group and the rest of the population. In particular, as a group strategy such as Judaism comes to be increasingly salient and powerful within a society, out-group members are expected to be increasingly likely to join highly cohesive groups in an effort to further their own interests. The theory and data discussed in this chapter, therefore, not only provide a perspective on evolutionary strategies such as Judaism, but also provide a tool for understanding the development of antithetical group strategies, as represented historically by anti-Semitic movements. External threat results in a higher sense of group cohesion among Jews, but the same processes occurring among Gentiles imply that they would be increasingly likely to join cohesive, relatively altruistic groups when they perceive themselves as engaged in resource competition and threatened by a highly cohesive group. From the perspective of Gentiles, the social identity processes summarized above imply that the presence of a cohesive, distinctive out-group (i.e., the Jews) would result in a heightened salience of in-group (i.e., Gentile) identification and corresponding devaluation of the out-group. In situations of external threat, group members close ranks and there is an increase in cohesiveness, solidarity, and the acceptance of collectivist rather than individualist social norms. Negative stereotypes regarding the out-group are developed, and there are cognitive biases such that negative information about the out-group is preferentially attended to and points of disagreement highlighted.

My suggestion is that in the long run highly successful group strategies spawn mirror images of themselves as nongroup members increasingly perceive a need to organize against the group strategy. The result is a fascinating historical dynamic in which the individualistic tendencies of prototypical Western societies have been punctuated in critical historical eras by the development of highly collectivist Western societies with powerful overtones of anti-Semitism (late Roman and medieval Western Christianity, Nazism). However, these issues lead well beyond the present chapter.

Whither Judaism and the West ?

What follows is the Conclusion of the last book ("The Culture of Critique: An Evolutionary Analysis of Jewish Involvement in Twentieth-Century Intellectual and Political Movements") of the three-volume "Judaism as a Group Evolutionary Strategy" series, by Kevin MacDonald.

Conclusion: Whither Judaism and the West?

One conclusion of this volume is that Jews have played a decisive role in developing highly influential intellectual and political movements that serve their interests in contemporary Western societies. These movements are only part of the story however. There has been an enormous growth in Jewish power and influence in Western societies generally, particularly the United States. Ginsberg (1993) notes that Jewish economic status and cultural influence have increased dramatically in the United States since 1960. Shapiro (1992, 116) shows that Jews are over-represented by at least a factor of nine on indexes of wealth, but that this is a conservative estimate, because much Jewish wealth is in real estate, which is difficult to determine and easy to hide. While constituting approximately 2.4 percent of the population of the United States, Jews represented half of the top one hundred Wall Street executives and about 40 percent of admissions to Ivy League colleges. Lipset and Raab (1995) note that Jews contribute between one-quarter and one-third of all political contributions in the United States, including one-half of Democratic Party contributions and one-fourth of Republican contributions. The general message of Goldberg's (1996) book *Jewish Power: Inside the American Jewish Establishment*, is that American Judaism is well organized and lavishly funded. It has achieved a great deal of power, and it has been successful in achieving its interests. There is a great deal of consensus on broad Jewish issues, particularly in the areas of Israel and the welfare of other foreign Jewries, immigration and refugee policy, church-state separation, abortion rights, and civil liberties (p. 5). Indeed, the consensus on these issues among Jewish activist organizations and the Jewish intellectual movements reviewed here despite a great deal of disagreement on other issues is striking. Massive changes in public policy on these issues beginning with the counter-cultural revolution of the 1960s coincide with the period of increasing Jewish power and influence in the United States. Since the 1950s empirical studies of ethnic hierarchy in the United States have tracked changes in ethnic group resources, including elite representation (e.g., Alba & Moore 1982; Lemer, Nagai & Rothman 1996). These studies have often emphasized the overrepresentation of Protestant whites in corporate hierarchies and the military, but have failed to take into consideration group differences in commitment and organization. Salter (1998b) provides a theoretically based assessment of Jewish influence relative to African Americans and gentile European Americans based on Blalock's (1967, 1989) model of group power as a function of resources multiplied by mobilization. Jews are far more mobilized than these other ethnic populations (one hesitates calling gentile European Americans a "group"). For example,

while specifically ethnic organizations devoted to the ethnic interests of gentile European Americans are essentially political fringe groups with meager funding and little influence on the mainstream political process, Salter notes that the America-Israel Public Affairs Committee ranked second out of the 120 most powerful lobbies as rated by members of Congress and professional lobbyists, with no other ethnic organization rated in the top 25. Furthermore, AIPAC is one of the few lobbies that relies heavily on campaign contributions to win allies. As indicated above, Jews contribute between one-third and one-half of all campaign money in federal elections, the donations motivated by "Israel and the broader Jewish agenda" (Goldberg 1996, 275). Jews are thus over-represented in campaign contributions by a factor of at least 13 based on their percentage of the population and are overrepresented by a factor of approximately 6.5 if adjustment is made for their higher average income. In overseas donations, the Jewish lead is even greater. For example, in the 1920s, before the post -- World War II explosion of Jewish giving to Israel, Jewish Americans may have given as much as 24 times more per capita to assist overseas Jews than did Irish Americans to assist Ireland in its struggle for independence from Great Britain. Yet this was the period of peak Irish ethnic philanthropy (Carroll 1978). The disparity has become much greater since World War II. Salter has adopted a preliminary conservative estimate of Jewish ethnic mobilization as four times that of white gentiles, based on comparison of per capita donations to non-religious ethnic causes. In the Blalock equation influence is affected not only by mobilization but also by the resources held by the group. Salter estimates that Jews control approximately 26 percent of the "cybernetic resources" of the United States (i.e., resources as measured by representation in key areas such as government, media, finance, academia, corporations, and entertainment). This average level of resource control reflects both areas of high (> 40 percent) Jewish representation (e.g., mass media, high finance, the legal profession, the intellectual elite, entertainment) and low (< 10 percent) Jewish representation (e.g., corporate elite, military leaders, religious leaders, legislators). The overall estimate is comparable to that made by Lerner et al. (1996, 20) based on data gathered in the 1970s and 1980s. Lerner et al. arrive at a 23 percent overall Jewish representation in American elites. The results also parallel levels of Jewish overrepresentation in other societies, as in early twentieth-century Germany where Jews constituting approximately one percent of the population controlled approximately 20 percent of the economy (Mosse 1987, 1989) and also had a dominating influence on the media and the production of culture (Deak 1968, 28; Laqueur 1974, 73). Substitution of these resource and mobilization values into the Blalock equation yields an estimate that Jewish influence on ethnic policy (immigration, race policy, foreign policy) is approximately three times the influence of gentile European Americans. The results are highly robust for different weightings of resources. Only an "extreme neo-Marxist" weighting of resources (i.e., one that weights only the corporate elite, the legislative branch of government, the military elite, foundations, and total group income) brings Jewish influence down to approximate parity of influence with gentile European Americans. As indicated above, there is a broad Jewish consensus on such issues as Israel and the welfare of other foreign Jewries, immigration and refugee policy, church-state separation, abortion rights, and civil liberties. This implies that Jewish influence and Jewish interests dominate these issues--a result that is highly compatible with the discussion of Jewish influence on immigration policy discussed Chapter 7 as well as the fact that all of these areas have seen enormous swings in

public policy in accordance with Jewish interests that coincide with the rise of Jewish influence in the United States. Salter's estimate that Jewish mobilization may be conceptualized as several times greater than that of gentile European Americans is well illustrated by the history of Jewish involvement in immigration policy: All of the major Jewish organizations were intensively involved in the battle over restrictive immigration for a period lasting an entire century despite what must have seemed devastating setbacks. This effort continues into the contemporary era. As discussed in Chapter 7, opposition to large-scale immigration of all racial and ethnic groups by large majorities of the European-derived population as well as the relative apathy of other groups--even groups such as Italian Americans and Polish Americans that might be expected to support the immigration of their own peoples--were prominent features of the history of immigration policy. This "rise of the Jews"--to use Albert Lindemann's (1997) phrase--has undoubtedly had important effects on contemporary Western societies. A major theme of the previous chapter is that high levels of immigration into Western societies conforms to a perceived Jewish interest in developing nonhomogeneous, culturally and ethnically pluralistic societies. It is of interest to consider the possible consequences of such a policy in the long term. In recent years there has been an increasing rejection among intellectuals and minority ethnic activists of the idea of creating a melting pot society based on assimilation among ethnic groups (see, e.g., Schlesinger 1992). Cultural and ethnic differences are emphasized in these writings, and ethnic assimilation and homogenization are viewed in negative terms. The tone of these writings is reminiscent of the views of many late-nineteenth- and early -twentieth-century Jewish intellectuals who rejected the assimilationist effects of Reform Judaism in favor of Zionism or a return to a more extreme form of cultural separatism such as Conservative or Orthodox Judaism. The movement toward ethnic separatism is of considerable interest from an evolutionary point of view. Between-group competition and monitoring of outgroups have been a characteristic of Jewish-gentile interactions not only in the West but also in Muslim societies, and there are examples of between-group competition and conflict too numerous to mention in other parts of the world. Historically, ethnic separatism, as seen in the history of Judaism, has been a divisive force within societies. It has on several occasions unleashed enormous intrasocietal hatred and distrust, ethnically based warfare, expulsions, pogroms, and attempts at genocide. Moreover, there is little reason to suppose that the future will be much different. At the present time there are ethnically based conflicts on every continent, and clearly the establishment of Israel has not ended ethnically based conflict for Jews returning from the diaspora. Indeed, my review of the research on contact between more or less impermeable groups in historical societies strongly suggests a general rule that between-group competition and monitoring of ingroup and outgroup success are the norm. These results are highly consistent with psychological research on social identity processes reviewed in SAID (Ch. 1). From an evolutionary perspective, these results confirm the expectation that ethnic self-interest is indeed important in human affairs, and obviously ethnicity remains a common source of group identity in the contemporary world. People appear to be aware of group membership and have a general tendency to devalue and compete with outgroups. Individuals are also keenly aware of the relative standing of their own group in terms of resource control and relative reproductive success. They are also willing to take extraordinary steps to achieve and retain economic and political power in defense of these group imperatives. Given the assumption of

ethnic separatism, it is instructive to think of the circumstances that would, from an evolutionary perspective, minimize group conflict. Theorists of cultural pluralism such as Horace Kallen (1924) envision a scenario in which different ethnic groups retain their distinctive identity in the context of complete political equality and economic opportunity. The difficulty with this scenario from an evolutionary perspective (or even a common sense perspective) is that no provision is made for the results of competition for resources and reproductive success within the society. Indeed, the results of ethnic strife were apparent in Kallen's day, but "Kallen lifted his eyes above the strife that swirled around him to an ideal realm where diversity and harmony coexist" (Higham 1984, 209). In the best of circumstances one might suppose that separated ethnic groups would engage in absolute reciprocity with each other, so that there would be no differences in terms of economic exploitation of one ethnic group by the other. Moreover, there would be no differences on any measure of success in society, including social class membership, economic role (e.g., producer versus consumer; creditor versus debtor; manager versus worker), or fertility between the separated ethnic groups. All groups would have approximately equal numbers and equal political power; or if there were different numbers, provisions would exist to ensure that minorities would retain equitable representation in terms of the markers of social and reproductive success. Such conditions would minimize hostility between the groups because attributing one's status to the actions of the other groups would be difficult. Given the existence of ethnic separatism, however, it would still be in the interests of each group to advance its own interests at the expense of the other groups. All things being equal, a given ethnic group would be better off if it ensured that the other groups had fewer resources, lower social status, lower fertility, and proportionately less political power than itself. The hypothesized steady state of equality therefore implies a set of balance-of-power relationships--each side constantly checking to make sure that the other is not cheating; each side constantly looking for ways to dominate and exploit by any means possible; each side willing to compromise only because of the other sides's threat of retaliation; each side willing to cooperate at cost only if forced to do so by, for example, the presence of external threat. Clearly, any type of cooperation that involves true altruism toward the other group could not be expected. Thus the ideal situation of absolute equality in resource control and reproductive success would certainly require a great deal of monitoring and undoubtedly be characterized by a great deal of mutual suspicion. In the real world, however, even this rather grim ideal is highly unlikely. In the real world, ethnic groups differ in their talents and abilities; they differ in their numbers, fertility, and the extent to which they encourage parenting practices conducive to resource acquisition; they also differ in the resources held at any point in time and in their political power. Equality or proportionate equity would be extremely difficult to attain or to maintain after it has been achieved without extraordinary levels of monitoring and without extremely intense social controls to enforce ethnic quotas on the accumulation of wealth, admission to universities, access to high status jobs, and so on. Because ethnic groups have differing talents and abilities and differing parenting styles, variable criteria for qualifying and retaining jobs would be required depending on ethnic group membership. Moreover, achieving parity between Jews and other ethnic groups would entail a high level of discrimination against individual Jews for admission to universities or access to employment opportunities and even entail a large taxation on Jews to counter the Jewish advantage in the possession of wealth, since at present

Jews are vastly over-represented among the wealthy and the successful in the United States. This would especially be the case if Jews were distinguished as a separate ethnic group from gentile European Americans. Indeed, the final evolution of many of the New York Intellectuals from Stalinism was to become neoconservatives who have been eloquent opponents of affirmative action and quota mechanisms for distributing resources. (Sachar [1992, 818ff] mentions Daniel Bell, Sidney Hook, Irving Howe, Irving Kristol, Nathan Glazer, Charles Krauthammer, Norman Podhoretz, and Earl Raab as opposed to affirmative action.) Jewish organizations (including the ADL, the AJCommittee, and the AJCongress) have taken similar positions Sachar (1992, 818ff). In the real world, therefore, extraordinary efforts would have to be made to attain this steady state of ethnic balance of power and resources. Interestingly, the ideology of Jewish-gentile coexistence has sometimes included the idea that the different ethnic groups develop a similar occupational profile and implicitly control resources in proportion to their numbers. In medieval France, for example, Louis IX's ordinance of 1254 prohibited Jews from engaging in money-lending at interest and encouraged them to live by manual labor or trade (see Richard 1992, 162). The dream of German assimilationists during the nineteenth century was that the occupational profile of Jews after emancipation would mirror that of the gentiles--a "utopian expectation . . . shared by many, Jews and non-Jews alike" (Katz 1986, 67). Efforts were made to decrease the percentage of Jews involved in trade and increase the percentages involved in agriculture and artisanry. In the event, however, the result of emancipation was that Jews were vastly over-represented among the economic and cultural elite, and this overrepresentation was a critical feature of German anti-Semitism from 1870 to 1933 (see SAID, Ch. 5). Similarly, during the 1920s when the United States was attempting to come to grips with Jewish competition at prestigious private universities, plans were proposed in which each ethnic group received a percentage of placements at Harvard reflecting the percentage of racial and national groups in the United States (Sachar 1992, 329). Similar policies--uniformly denounced by Jewish organizations--developed during the same period throughout Central Europe (Hagen 1996). Such policies certainly reflect the importance of ethnicity in human affairs, but levels of social tension are bound to be chronically high. Moreover, there is a considerable chance of ethnic warfare even were precise parity achieved through intensive social controls: As indicated above, it is always in the interests of any ethnic group to obtain hegemony over the others. If one adopts a cultural pluralism model involving free competition for resources and reproductive success, differences between ethnic groups are inevitable; from an evolutionary perspective, there is the very strong prediction that such differences will result in animosity from the losing groups. After emancipation there was a powerful tendency for upward mobility among Jews in Western societies, including a large overrepresentation in the professions as well as in business, politics, and the production of culture. Concomitantly there were outbreaks of anti-Semitism originating often among groups that felt left behind in this resource competition or who felt that the culture being left behind in this resource competition or who felt that the culture being created did not meet their interests. If the history of Judaism tells us anything, it is that self-imposed ethnic separatism tends to lead to resource competition based on group membership, and consequent hatred, expulsions, and persecutions. Assuming that ethnic differences in talents and abilities exist, the supposition that ethnic separatism could be a stable situation without ethnic animosity requires either a balance

of power situation maintained with intense social controls, as described above, or it requires that at least some ethnic groups be unconcerned that they are losing in the competition. I regard this last possibility as unlikely in the long run. That an ethnic group would be unconcerned with its own eclipse and domination is certainly not expected by an evolutionist or, indeed, by advocates of social justice whatever their ideology. Nevertheless, this is in fact the implicit morality of the criticism by several historians of the behavior of the Spanish toward the Jews and Marranos during the Inquisition and the Expulsion, as, for example, in the writings of Benzion Netanyahu (1995), who at times seems openly contemptuous of the inability of the Spaniards to compete with the New Christians without resorting to the violence of the Inquisition. From this perspective, the Spaniards should have realized their inferiority and acquiesced in being economically, socially, and politically dominated by another ethnic group. Such a "morality" is unlikely to appeal to the group losing the competition, and from an evolutionary perspective, this is not in the least surprising. Goldwin Smith (1894/1972, 261) made a similar point a century ago: "A community has a right to defend its territory and its national integrity against an invader whether his weapon be the sword or foreclosure. In the territories of the Italian Republics the Jews might so far as we see, have bought land and taken to farming had they pleased. But before this they had thoroughly taken to trade. Under the falling Empire they were the great slave-traders, buying captives from barbarian invaders and probably acting as general brokers of spoils at the same time. They entered England in the train of the Norman conqueror. There was, no doubt, a perpetual struggle between their craft and the brute force of the feudal populations. But what moral prerogative has craft over force? Mr. Arnold White tells the Russians that, if they would let Jewish intelligence have free course, Jews would soon fill all high employments and places of power to the exclusion of the natives, who now hold them. Russians are bidden to acquiesce and rather to rejoice in this by philosophers, who would perhaps not relish the cup if it were commended to their own lips. The law of evolution, it is said, prescribes the survival of the fittest. To which the Russian boor may reply, that if his force beats the fine intelligence of the Jew the fittest will survive and the law of evolution will be fulfilled. It was force rather than fine intelligence which decided on the field of Zama that the Latin, not the Semite, should rule the ancient and mould the modern world." Ironically, many intellectuals who absolutely reject evolutionary thinking and any imputation that genetic self-interest might be important in human affairs also favor policies that are rather obviously self-interestedly ethnocentric, and they often condemn the self-interested ethnocentric behavior of other groups, particularly any indication that the European-derived majority in the United States is developing a cohesive group strategy and high levels of ethnocentrism in reaction to the group strategies of others. The ideology of minority group ethnic separatism and the implicit legitimization of group competition for resources, as well as the more modern idea that ethnic group membership should be a criterion for resource acquisition, must be seen for what they are: blueprints for group evolutionary strategies. The history of the Jews must be seen as a rather tragic commentary on the results of such group strategies. The importance of group-based competition cannot be overstated. I believe it is highly unlikely that Western societies based on individualism and democracy can long survive the legitimization of competition between impermeable groups in which group membership is determined by ethnicity. The discussion in SAID (Chs. 3-5) strongly suggests that ultimately group strategies are met by group strategies,

and that societies become organized around cohesive, mutually exclusionary groups. Indeed, the recent multicultural movement may be viewed as tending toward a profoundly non-Western form of social organization that has historically been much more typical of Middle Eastern segmentary societies centered around discrete homogeneous groups. However, unlike in the multicultural ideal, in these societies there are pronounced relations of dominance and subordination. Whereas democracy appears to be quite foreign to such segmentary societies, Western societies, uniquely among the stratified societies of the world, have developed individualistic democratic and republican political institutions. Moreover, major examples of Western collectivism, including German National Socialism and Iberian Catholicism during the period of the Inquisition, have been characterized by intense anti-Semitism. There is thus a significant possibility that individualistic societies are unlikely to survive the intra-societal group-based competition that has become increasingly common and intellectually respectable in the United States. I believe that in the United States we are presently heading down a volatile path--a path that leads to ethnic warfare and to the development of collectivist, authoritarian, and racist enclaves. Although ethnocentric beliefs and behavior are viewed as morally and intellectually legitimate only among ethnic minorities in the United States, the theory and the data presented in SAID indicate that the development of greater ethnocentrism among European-derived peoples is a likely result of present trends. One way of analyzing the Frankfurt School and psychoanalysis is that they have attempted with some success to erect, in the terminology of Paul Gottfried (1998) and Christopher Lasch (1991), a "therapeutic state" that pathologizes the ethnocentrism of European-derived peoples as well as their attempts to retain cultural and demographic dominance. However, ethnocentrism on the part of the European-derived majority in the United States is a likely outcome of the increasingly group-structured contemporary social and political landscape--likely because evolved psychological mechanisms in humans appear to function by making ingroup and outgroup membership more salient in situations of group-based resource competition (see SAID, Ch. 1). The effort to overcome these inclinations thus necessitates applying to Western societies a massive "therapeutic" intervention in which manifestations of majoritarian ethnocentrism are combated at several levels, but first and foremost by promoting the ideology that such manifestations are an indication of psychopathology and a cause for ostracism, shame, psychiatric intervention, and counseling. One may expect that as ethnic conflict continues to escalate in the United States, increasingly desperate attempts will be made to prop up the ideology of multiculturalism with sophisticated theories of the psychopathology of majority group ethnocentrism, as well as with the erection of police state controls on nonconforming thought and behavior. I suppose that a major reason some non-Jewish racial and ethnic groups adopt multiculturalism is that they are not able to compete successfully in an individualistic economic and cultural arena. As a result, multiculturalism has quickly become identified with the idea that each group ought to receive a proportional measure of economic and cultural success. As indicated above, the resulting situation may oppose Jewish interests. Because of their high intelligence and resource-acquisition ability, Jews do not benefit from affirmative action policies and other group-based entitlements commonly advocated by minority groups with low social status. Jews thus come into conflict with other ethnically identified minority groups who use multiculturalism for their own purposes. (Nevertheless, because of their competitive advantage within the white, European-

derived group with which they are currently classified, Jews may perceive themselves as benefiting from policies designed to dilute the power of the European-derived group as a whole on the assumption that they would not suffer any appreciable effect. Indeed, despite the official opposition to group-based preferences among Jewish organizations, Jews voted for an anti-affirmative action ballot measure in California in markedly lower percentages than did other European-derived groups.) Although multiculturalist ideology was invented by Jewish intellectuals to rationalize the continuation of separatism and minority-group ethnocentrism in a modern Western state, several of the recent instantiations of multiculturalism may eventually produce a monster with negative consequences for Judaism. Irving Louis Horowitz (1993, 89) notes the emergence of anti-Semitism in academic sociology as these departments are increasingly staffed by individuals who are committed to ethnic political agendas and who view Jewish domination of sociology in negative terms. There is a strong strain of anti-Semitism emanating from some multiculturalist ideologues, especially from Afrocentric ideologues (Alexander 1992), and Cohen (1998, 45) finds that "multiculturalism is often identified nowadays with a segment of the left that has, to put it bluntly, a Jewish problem." Recently the Nation of Islam, led by Louis Farrakhan, has adopted an overt anti-Semitic rhetoric. Afrocentrism is often associated with racialist ideologies, such as those of Molefi Asante (1987), in which ethnicity is viewed as the morally proper basis of self-identity and self-esteem and in which a close connection exists between ethnicity and culture. Western ideals of objectivity, universalism, individualism, rationality, and the scientific method are rejected because of their ethnic origins. Asante accepts a naive racialist theory in which Africans (the "sun people") are viewed as superior to Europeans (the "ice people"). Such movements mirror similar Jewish ideologies that rationalize a powerful concern with Jewish ethnicity and attempt to produce feelings of ethnic superiority within the group. These ideologies have been common throughout Jewish intellectual history, the most enduring embodied in the idea of chosenness and the "light of the nations" concept. SAID (Ch. 7) reviewed evidence indicating that Jewish historians and intellectuals, beginning in the ancient world, have often attempted to show that gentile cultural influences have had specifically Jewish precedents or even that various gentile philosophers and artists were actually Jews. This tradition has been carried on recently by two Sephardic Jews, Martin Bernal (1987) in his *Black Athena* and Jose Faur (1992) in his *In the Shadow of History: Jews and Conversos at the Dawn of Modernity*. Indeed, there may well be a general trend since the Enlightenment in which Jewish intellectuals have been at the vanguard of secular political movements, such as the movement for cultural pluralism, intended to serve Jewish interests as well as appeal to segments of the gentile population. Also apparent is a trend such that eventually these movements fractionate, the result of anti-Semitism within the very segment of the gentile population to which the ideology attempts to appeal, and Jews abandon these movements and seek to pursue their interests by other means. Thus it has been noted here that Jews have played a prominent role in the political left in this century. We have also seen that as a result of anti-Semitism among gentiles on the left and on the part of Communist governments, eventually Jews either abandoned the left or they developed their own brand of leftism in which leftist universalism was compatible with the primacy of Jewish identity and interests.' Gore Vidal (1986) is a prominent example of a gentile leftist intellectual who has been highly critical of the role of neoconservative Jews in facilitating the U.S. military buildup of the 1980s and

allying themselves with conservative political forces to aid Israel--charges interpreted as implying anti-Semitism because of the implication that American Jews place the interests of Israel above American interests (Podhoretz 1986). Vidal also suggests that neoconservatism is motivated by the desire of Jews to make an alliance with gentile elites as a defense against possible anti-Semitic movements emerging during times of economic crisis. Indeed, fear of anti-Semitism on the left has been the major impetus for founding the neoconservative movement (see Gottfried 1993, 80)--the final resting point of many of the New York Intellectuals whose intellectual and cumulative effect of neoconservatism and its current hegemony over the conservative political movement in the United States (achieved partly by its large influence on the media and among foundations) has been to shift the conservative movement toward the center and, in effect, to define the limits of conservative legitimacy. Clearly, these limits of conservative legitimacy are defined by whether they conflict with specifically Jewish group interests in a minimally restrictive immigration policy, support for Israel, global democracy, opposition to quotas and affirmative action, and so on. As indicated in William F. Buckley's (1992) *In Search of Anti-Semitism*, however, the alliance between gentile paleoconservatives and Jewish neoconservatives in the United States is fragile, with several accusations of anti-Semitism among the paleoconservatives. Much of the difficulty derives from the tension between the nationalist tendencies of an important segment of U.S. conservatism and the perceptions of at least some gentile conservatives that Jewish neoconservatism is essentially a device for pursuing narrow Jewish sectarian interests, particularly with regard to Israel, church-state separation, and affirmative action. Moreover, the neoconservative commitment to many aspects of the conservative social agenda is half-hearted at best (Gottfried 1993). Most importantly, neoconservatives pursue what is essentially an ethnic agenda regarding immigration while opposing the ethnocentric interests of the paleoconservatives in retaining their ethnic hegemony. The ethnic agenda of neoconservatism can also be seen in their promotion of the idea that the United States should pursue a highly interventionist foreign policy aimed at global democracy and the interests of Israel rather than aimed at the specific national interests of the United States (Gottfried 1993). Neoconservatism has also provided a Jewish influence on the American conservative movement to counterbalance the strong tendency for Jews to support liberal and leftist political candidates. Jewish ethnic interests are best served by influencing both major parties toward a consensus on Jewish issues, and, as indicated above, neoconservatism has served to define the limits of conservative legitimacy in a manner that conforms to Jewish interests. As anti-Semitism develops, Jews begin to abandon the very movements for which they originally provided the intellectual impetus. This phenomenon may also occur in the case of multiculturalism. Indeed, many of the most prominent opponents of multiculturalism are Jewish neoconservatives, as well as organizations such as the National Association of Scholars (NAS), which have a large Jewish membership. (The NAS is an organization of academics opposed to some of the more egregious excesses of feminism and multiculturalism in the university.) It may well be the case, therefore, that the Jewish attempt to link up with secular political ideologies that appeal to gentiles is doomed in the long run. Ginsberg (1993, 224ff) essentially makes this point when he notes that there is increasing evidence for anti-Semitism among American liberals, conservatives, and populist radicals. The case of multiculturalism is particularly problematic as a Jewish strategy. In this case one might

say that Jews want to have their cake and eat it too. "Jews are often caught between fervent affirmation of the Enlightenment and criticism of it. Many Jews believe that the replacement of the Enlightenment ideal of universalism with a politics of difference and a fragmented 'multiculture' would constitute a threat to Jewish achievement. At the same time, they recognize the dangers of a homogeneous 'monoculture' for Jewish particularity... [Jews] seek to rescue the virtues of the Enlightenment from the shards of its failures and salvage an inclusive vision from multiculturalism, where fragmentation and divisiveness now reign" (Biale, Galchinsky, & Heschel 1998, 7). Multicultural societies with their consequent fragmentation and chronic ethnic tension are unlikely to meet Jewish needs in the long run even if they do ultimately subvert the demographic and cultural dominance of the peoples of European origin in lands where they have been dominant. This in turn suggests a fundamental and irresolvable friction between Judaism and prototypical Western political and social structure. Certainly the very long history of anti-Semitism in Western societies and its recurrence time and again after periods of latency suggests such a view. The incompatibility of Judaism and Western culture can also be seen in the tendency for individualistic Western cultures to break down Jewish group cohesiveness. As Arthur Ruppin (1934, 339) noted earlier in the century, all modern manifestations of Judaism, from neo-Orthodoxy to Zionism, are responses to the Enlightenment's corrosive effects on Judaism--a set of defensive structures erected against "the destructive influence of European civilization." And at a theoretical level, there is a very clear rationale for supposing that Western individualism is incompatible with group-based resource conflict that has been the consistent consequence of the emergence of a powerful Judaism in Western societies (see SAID, Chs. 3--5). One aspect of this friction is well articulated in Alan Ryan's (1994, 11) discussion of the "latent contradiction" in the politics of Richard J. Herrnstein and Charles Murray, the authors of the highly controversial volume *The Bell Curve: Intelligence and Class Structure in American Life*. Ryan states, "Herrnstein essentially wants the world in which clever Jewish kids or their equivalent make their way out of their humble backgrounds and end up running Goldman Sachs or the Harvard physics department, while Murray wants the Midwest in which he grew up--a world in which the local mechanic didn't care two cents whether he was or wasn't brighter than the local math teacher. The trouble is that the first world subverts the second, while the second feels claustrophobic to the beneficiaries of the first." The social structure whose acceptance is here attributed to Murray envisions a moderately individualistic society, a society that is meritocratic and hierarchical but also cohesive and culturally and ethnically homogeneous. It is a society with harmony among the social classes and with social controls on extreme individualism among the elite. There has been a powerful Western tendency to develop such societies, beginning at least in the Middle Ages, but also present, I believe, in the classical Roman civilization of the Republic. The ideal of hierarchic harmony is central to the social program of the Catholic Church beginning during the late Roman Empire and reaching its pinnacle during the High Middle Ages (MacDonald 1995c; SAID, Ch. 5). This ideal is apparent also in a powerful strand of German intellectual history beginning with Herder in the eighteenth century. A very central feature of this prototypical Western hierarchical harmony has been the social imposition of monogamy as a form of reproductive leveling that dampens the association between wealth and reproductive success. From an evolutionary perspective, Western societies achieve their cohesion because hierarchical social relationships are significantly divorced from

reproductive consequences. Such a world is threatened from above by the domination of an individualistic elite without commitment to responsible lower-status individuals who may have lesser intellectual ability, talent, or financial resources. It is threatened from within by the development of a society constituted by a set of ethnically divided, chronically competing, highly impermeable groups as represented historically by Judaism and currently envisioned as the model for society by the proponents of multiculturalism. And it is threatened from below by an increasing underclass of people with the attributes described by Herrnstein and Murray: intellectually incompetent and insufficiently conscientious to hold most kinds of job; irresponsible and incompetent as parents; prone to requiring public assistance; prone to criminal behavior, psychiatric disorders, and substance abuse; and prone to rapid demographic increase. Such people are incapable of contributing economically, socially, or culturally to a late-twentieth-century society or, indeed, to any human civilization characterized by a substantial degree of reciprocity, voluntarism and democracy. Given that the continued existence of Judaism implies that the society will be composed of competing, more or less impermeable groups, the neoconservative condemnation of multiculturalism must be viewed as lacking in intellectual consistency. The neoconservative prescription for society embraces a particular brand of multiculturalism in which the society as a whole will be culturally fragmented and socially atomistic. These social attributes not only allow Jewish upward mobility, but also are incompatible with the development of highly cohesive, anti-Semitic groups of gentiles; they are also incompatible with group-based entitlements and affirmative action programs that would necessarily discriminate against Jews. As Horowitz (1993, 86) notes, "High levels of cultural fragmentation coupled with religious options are likely to find relatively benign forms of anti-Semitism coupled with a stable Jewish condition. Presumed Jewish cleverness or brilliance readily emerges under such pluralistic conditions, and such cleverness readily dissolves with equal suddenness under politically monistic or totalitarian conditions." Jewish neoconservatives readily accept a radically individualistic society in which Jews would be expected to become economically, politically, and culturally dominant while having minimal allegiance to the lower (disproportionately gentile) social classes. Such a society is likely to result in extreme social pressures as the responsible lower middle classes are placed in an increasingly precarious economic and political situation. As in the case of the intellectual activity of the Frankfurt School, the Jewish neoconservative prescription for the society as a whole is radically opposed to the strategy for the ingroup. Traditional Judaism, and to a considerable extent contemporary Judaism, obtained its strength not only from its intellectual and entrepreneurial elite but also from the unshakable allegiance of responsible, hardworking, lower-status Jews of lesser talent whom they patronized. And it must be stressed here that historically, the popular movements that have attempted to restore this prototypical Western state of hierarchic harmony, in opposition to the exploitation of individualistic elites and the divisiveness of intergroup conflict, have often had intensely anti-Semitic overtones. Moreover, to a considerable extent the font et origo of the social policies and cultural shifts that have resulted in the dangerous situation now rapidly developing in the United States has been the Jewish-dominated intellectual and political movements described in this volume. I have attempted to document the role of those movements, particularly the 1960s leftist political and intellectual movement, in subjecting Western culture to radical criticism; it is the legacy of this cultural movement that has taken the

lead in providing the intellectual basis of the multiculturalist movement and in rationalizing social policies that expand the underclass and expand the demographic and cultural presence of non-European peoples in Western societies. From the standpoint of these leftist critics, the Western ideal of hierarchic harmony and assimilation is perceived as an irrational, romantic, and mystical ideal. Western civility is nothing more than a thin veneer masking a reality of exploitation and conflict---"a vast ecclesia super cloacum" (Cuddihy 1974, 142). It is interesting in this regard that a basic strand of sociological theory beginning with Marx has been to emphasize conflict between social classes rather than social harmony. For example, Irving Louis Horowitz (1993, 75) notes that one result of the massive influence of Jewish intellectuals on American sociology beginning in the 1930s was that--"the sense of America as a consensual experience gave way to a sense of America as a series of conflicting definitions," including a heightened concern with ethnicity in general. Historically, this conflict conception of social structure has typically been combined with the idea that the inevitable struggle between social classes can be remedied only by the complete leveling of economic and social outcomes. This latter ideal can then be attained only by adopting a radical environmentalist perspective on the origins of individual differences in economic success and other cultural attainments and by blaming any individual shortcomings on unequal environments. Because this radical environmentalism is scientifically unfounded, the social policies based on this ideology tend to result in high levels of social conflict as well as an increase in the prevalence of intellectual incompetence and social pathology. From an evolutionary perspective, the prototypical Western social organization of hierarchic harmony and muted individualism is inherently unstable, a situation that undoubtedly contributes to the intensely dynamic nature of Western history. It has often been remarked that in the history of China nothing ever really changed. Dynasties characterized by intensive polygyny and moderate to extreme political despotism came and went, but there were no fundamental social changes over a very long period of historical time. The data reviewed by Betzig (1986) indicate that much the same can be said about the history of political organization in other stratified human societies. In the West, however, the prototypical state of social harmony described above is chronically unstable. The unique initiating conditions involving a significant degree of reproductive leveling have resulted in a highly dynamic historical record (see MacDonald 1995c). The most common threat to hierarchic harmony has been the individualistic behavior of elites--a tendency that hardly surprises an evolutionist. Thus the early phases of industrialization were characterized by the unraveling of the social fabric and high levels of exploitation and conflict among the social classes. As another example, the slavery of Africans was a short-term benefit to an individualistic elite of southern aristocrats in the United States, but it also resulted in exploitation of the slaves and has been a long-term calamity for the society as a whole. We have also seen that Western elites in traditional societies have often actively encouraged Jewish economic interests to the detriment of other sectors of the native population, and in several historical eras Jews have been the instruments of individualistic behavior among gentile elites thus facilitating such individualistic behavior. Of considerable importance to the history of U.S. immigration policy has been the collaboration between Jewish activists and elite gentile industrialists interested in cheap labor, at least in the period prior to 1924. Recently, writers such as Peter Brimelow (1995, 229--232) and Paul Gottfried (1998) have called attention to an elite 'New Class' of internationalists who are

opposed to the nation-state based on ethnic ties and highly favorable to immigration that decreases the ethnic homogeneity of traditional societies. The self-interest of this group is to cooperate with similar individuals in other countries rather than to identify with the lower levels of their own society. Although this type of internationalism is highly congruent with a Jewish ethnic agenda--and Jews are undoubtedly disproportionately represented among this group, gentile members of the New Class must be seen as pursuing a narrowly individualistic agenda. The individualism of elites has not been the only threat to Western hierarchic harmony, however. As recounted in SAID, this ideal has been shattered in critical historical eras by intense group conflict between Judaism and segments of gentile society. In the present age, perhaps for the first time in history, this hierarchic harmony is threatened by the development of an underclass whose membership consists disproportionately of racial and ethnic minority members and which has also resulted in intense group-based conflict. In particular, it is the large disproportion of African Americans in the American underclass that makes any political solution to this threat to hierarchic harmony problematic. I have suggested that there is a fundamental and irresolvable friction between Judaism and prototypical Western political and social structure. The present political situation in the United States (and several other Western countries) is so dangerous because of the very real possibility that the Western European tendency toward hierarchic harmony has a biological basis. The greatest mistake of the Jewish-dominated intellectual movements described in this volume is that they have attempted to establish the moral superiority of societies that embody a preconceived moral ideal (compatible with the continuation of Judaism as a group evolutionary strategy) rather than advocate social structures based on the ethical possibilities of naturally occurring types. In the twentieth century many millions of people have been killed in the attempt to establish Marxist societies based on the ideal of complete economic and social leveling, and many more millions of people have been killed as a result of the failure of Jewish assimilation into European societies. Although many intellectuals continue to attempt to alter fundamental Western tendencies toward assimilation, muted individualism, and hierarchic harmony, there is a real possibility that these Western ideals are not only more achievable but also profoundly ethical. Uniquely among all stratified cultures of the world, prototypical Western societies have provided the combination of a genuine sense of belonging, a large measure of access to reproductive opportunities, and the political participation of all social classes combined with the possibilities of meritocratic upward social mobility. As an evolutionist, one must ask what the likely genetic consequences of this sea change in American culture are likely to be. An important consequence--and one likely to have been an underlying motivating factor in the countercultural revolution--may well be to facilitate the continued genetic distinctiveness of the Jewish gene pool in the United States. The ideology of multiculturalism may be expected to increasingly compartmentalize groups in American society, with long-term beneficial consequences on continuation of the essential features of traditional Judaism as a group evolutionary strategy. There is increasing consensus among Jewish activists that traditional forms of Judaism are far more effective in ensuring long-term group continuity than semi-assimilationist, semi-cryptic strategies such as Reform Judaism or secular Judaism. Reform Judaism is becoming steadily more conservative, and there is a major effort within all segments of the Jewish community to prevent intermarriage (e.g., Abrams 1997; Dershowitz 1997; see pp. 244-245). Moreover, as discussed in several parts of

this book, Jews typically perceive themselves to benefit from a nonhomogeneous culture in which they appear as only one among many ethnic groups where there is no possibility of the development of a homogeneous national culture that might exclude Jews. In addition, there may well be negative genetic consequences for the European-derived peoples of the United States and especially for the "common people of the South and West" (Higham I 984, 49)--that is, for lower-middle-class Caucasians derived from Northern and Western Europe--whose representatives fought a desperate and prolonged political battle against the present immigration policy. Indeed, we have seen that a prominent theme of the New York Intellectuals as well as the Authoritarian Personality studies was the intellectual and moral inferiority of traditional American culture, particularly rural American culture. James Webb (1995) notes that it is the descendants of the WASPS who settled the West and South who "by and large did the most to lay out the infrastructure of this country, quite often suffering educational and professional regression as they tamed the wilderness, built the towns, roads and schools, and initiated a democratic way of life that later white cultures were able to take advantage of without paying the price of pioneering. Today they have the least, socioeconomically, to show for these contributions. And if one would care to check a map, they are from the areas now evincing the greatest resistance to government practices." The war goes on, but it is easy to see who is losing. The demographic rise of the underclass resulting from the triumph of the 1960s counter-cultural revolution implies that European-derived genes and gene frequencies will become less common compared to those derived from the African and the Latin American gene pools. On the other end of the IQ--reproductive strategy distribution, immigrants from East Asian countries are out-competing whites, especially of the lower-middle and working classes, in gaining admission to universities and in prestigious, high-income jobs. The long term result will be that the entire white population (not including Jews) is likely to suffer a social status decline as these new immigrants become more numerous. (Jews are unlikely to suffer a decline in social status not only because their mean IQ is well above that of the East Asians but, more importantly, also because Jewish IQ is highly skewed toward excelling in verbal skills. The high IQ of East Asians is skewed toward performance IQ, which makes them powerful competitors in engineering and technology. See PTSDA, [Ch. 7] and Lynn [1987]. Jews and East Asians are thus likely to occupy different ecological niches in contemporary societies.) Lower-middle-class Caucasians, more than any other group, are expected to lose out. If present trends continue, in the long run the United States will be dominated by an Asian technocratic elite and a Jewish business, professional, and media elite. Moreover, the shift to multiculturalism has coincided with an enormous growth of immigration from non-European-derived peoples beginning with the Immigration Act of 1965, which favored immigrants from non-European countries (see Auster 1990; Brimelow 1995). Many of these immigrants come from non-Western countries where cultural and genetic segregation are the norm, and within the context of multicultural America, they are encouraged to retain their own languages and religions and encouraged to marry within the group. As indicated above, the expected result will be between-group resource and reproductive competition and increased vulnerability of democratic and republican political institutions in a context in which longterm projections indicate that European-derived peoples will no longer be a majority of the United States by the middle of the next century. Indeed, one might note that, while the Western Enlightenment has presented Judaism with its greatest

challenge in all of its long history, contemporary multiculturalism in the context of high levels of immigration of peoples of all racial and ethnic groups presents the greatest challenge to Western universalism in its history. The historical record indicates that ethnic separatism among Caucasian-derived groups has a tendency to collapse within modern Western societies unless active attempts at ethnic and cultural segregation are undertaken, as has occurred among Jews. As expected from a resource-reciprocity point of view (MacDonald 1991, 1995b,c), in the absence of rigid ethnic barriers, marriage in Western individualist societies tends to be importantly influenced by a wide range of phenotypic features of the prospective spouse, including not only genetic commonality but also social status, personality, common interests, and other points of similarity. This individualist pattern of marriage decisions has characterized Western Europe at least since the Middle Ages (e.g., MacFarlane 1986; see PTSDA , Ch. 8). The result has been a remarkable degree of ethnic assimilation in the United States among those whose ancestry derives from Europe (Alba 1985). This is particularly noteworthy because ethnic conflict and violence are on the rise in Eastern Europe, yet European-derived groups in the United States have an overwhelming sense of commonality. The long-term result of such processes is genetic homogenization, a sense of common interest, and the absence of a powerful source of intrasocietal division. To suppose that the conflict over immigration has been merely a conflict over the universalist tendencies of Western culture would, however, be disingenuous. To a great extent the immigration debate in the United States has always had powerful ethnic overtones and continues to do so even after the European-derived peoples of the United States have become assimilated into a Western universalist culture. The present immigration policy essentially places the United States and other Western societies "in play" in an evolutionary sense which does not apply to other nations of the world, where the implicit assumption is that territory is held by its historically dominant people: Each racial and ethnic group in the world has an interest in expanding its demographic and political presence in Western societies and can be expected to do so if given the opportunity. Notice that American Jews have had no interest in proposing that immigration to Israel should be similarly multiethnic, or that Israel should have an immigration policy that would threaten the hegemony of Jews. I rather doubt that Oscar Handlin (1952, 7) would extend his statement advocating immigration from all ethnic groups into the United States by affirming the principle that all men, being brothers, are equally capable of being Israelis. I also doubt that the Synagogue Council of America would characterize Israeli immigration law as "a gratuitous affront to the peoples of many regions of the world" (PCN 1953, 117). Indeed, the ethnic conflict within Israel indicates a failure to develop a universalist Western culture. Consider the disparities between Jewish attitudes regarding multiculturalism in Israel versus the United States. "From a Jewish viewpoint, rejection of Zionism as an ideology and a force shaping the state [of Israel] is like rejecting the state itself. The refined distinction between the state and its character, and that between its Jewishness and Zionism, are neither understood nor condoned by the Jews. They are not interested in having Israel as a state, but rather as a Jewish-Zionist state. . . . While it is legal, but not legitimate, in Israel to reject publicly or act against Zionism, according to the 1985 amendment of the election law, one may not run for the Knesset on an election slate which denies Israel as the state of the Jewish people. (Smooha 1990, 397)" "A substantial digression from [the principle of equality] is caused by the special legal status accorded to the Jewish Agency and Jewish National Fund. They perform

quasi-governmental functions such as planning and funding of new rural localities, support for cultural enterprises, provision of assistance to the elderly and other disadvantaged groups, and development and leasing of lands. Yet by their own constitution, these powerful institutions are obliged to serve Jews only. . . . Discrimination is also embedded in the Jewish Religious Services Law which provides for publicly funded religious services to Jews only. Most of the discrimination is, however, rather covert.(Smootha 1990, 401)" Smootha (1990, 403) also notes that in a 1988 survey, 74 percent of Israeli Jews said that the state should prefer Jews to Arabs, and 43 percent favored the denial of the right to vote to Israeli Arab citizens. Whereas American Jews have been in the forefront of efforts to ensure ethnic diversity in the United States and other Western societies, 40 percent of the Jewish respondents agreed that Israel should encourage Israeli Arabs to leave the country, 37 percent had reservations, and only 23 percent objected to such a policy. Almost three quarters of Israeli Jews did not want to have an Arab as a superior in a job. Moreover, immigration to Israel is officially restricted to Jews. It is also noteworthy that whereas Jews have been on the forefront of movements to separate church and state in the United States and often protested lack of religious freedom in the Soviet Union, the Orthodox rabbinical control of religious affairs in Israel has received only belated and half-hearted opposition by American Jewish organizations (Cohen 1972, 317) and has not prevented the all-out support of Israel by American Jews, despite the fact that Israel's policy is opposite to the policies that Jewish organizations have successfully pursued in Western democracies. This phenomenon is an excellent example of the incompatibility of Judaism with Western forms of social organization, which results in a recurrent gap between Jewish behavior vis-a-vis its own group strategy and Jewish attempts to manipulate Western societies to conform to Jewish group interests. At present the interests of non-European-derived peoples to expand demographically and politically in the United States are widely perceived as a moral imperative, whereas the attempts of the European-derived peoples to retain demographic, political, and cultural control is represented as "racist," immoral, and an indication of psychiatric disorder. From the perspective of these European-derived peoples, the prevailing ethnic morality is altruistic and self-sacrificial. It is unlikely to be viable in the long run, even in an individualistic society. As we have seen, the viability of a morality of self-sacrifice is especially problematic in the context of a multicultural society in which everyone is conscious of group membership and there is between-group competition for resources. Consider from an evolutionary perspective the status of the argument that all peoples should be allowed to immigrate to the United States. One might assert that any opposition to such a principle should not interest an evolutionist because human group genetic differences are trivial, so any psychological adaptations that make one resist such a principle are anachronisms without function in the contemporary world (much like one's appendix). A Jew maintaining this argument should, to retain intellectual consistency, agree that the traditional Jewish concern with endogamy and consanguinity has been irrational. Moreover, such a person should also believe that Jews ought not attempt to retain political power in Israel because there is no rational reason to suppose that any particular group should have power anywhere. Nor should Jews attempt to influence the political process in the United States in such a manner as to disadvantage another group or benefit their own. And to be logically consistent, one should also apply this argument to all those who promote immigration of their own ethnic groups, the mirror image of group-based opposition to such immigration. Indeed, if

this chain of logic is pursued to its conclusion, it is irrational for anyone to claim any group interests at all. And if one also rejects the notion of individual genetic differences, it is also irrational to attempt to further individual interests, for example, by seeking to immigrate as an individual. Indeed, if one accepts these assumptions, the notion of genetic consequences and thus of the possibility of human evolution past and present becomes irrational; the idea that it is rational is merely an illusion produced perhaps by psychological adaptations that are without any meaningful evolutionary function in the contemporary world. One might note that this ideology is the final conclusion of the anti-evolutionary ideologies reviewed in this volume. These intellectual movements have asserted that scientific research shows that any important ethnic differences or individual differences are the result of environmental variation, and that genetic differences are trivial. But there is an enormous irony in all of this: If life is truly without any evolutionary meaning, why have advocates propagated these ideologies so intensely and with such self-consciously political methods? Why have many of these same people strongly identified with their own ethnic group and its interests, and why have many of them insisted on cultural pluralism and its validation of minority group ethnocentrism as moral absolutes? By their own assumptions, it is just a meaningless game. Nobody should care who wins or loses. Of course, deception and self-deception may be involved. I have noted (p. 195) that a fundamental agenda has been to make the European-derived peoples of the United States view concern about their own demographic and cultural eclipse as irrational and as an indication of psychopathology. If one accepts that both within-group and between-group genetic variation remains and is non-trivial (i.e., if evolution is an ongoing process), then the principle of relatively unrestricted immigration, at least under the conditions obtaining in late twentieth-century Western societies, clearly involves altruism by some individuals and established groups. Nevertheless, although the success of the intellectual movements reviewed in this volume is an indication that people can be induced to be altruistic toward other groups, I rather doubt such altruism will continue if there are obvious signs that the status and political power of European-derived groups is decreasing while the power of other groups increases. The prediction, both on theoretical grounds and on the basis of social identity research, is that as other groups become increasingly powerful and salient in a multicultural society, the European-derived peoples of the United States will become increasingly unified; among these peoples, contemporary divisive influences, such as issues related to gender and sexual orientation, social class differences, or religious differences, will be increasingly perceived as unimportant. Eventually these groups will develop a united front and a collectivist political orientation vis-a-vis the other ethnic groups. Other groups will be expelled if possible or partitions will be created, and Western societies will undergo another period of medievalism. Jewish interests in immigration policy are an example of conflicts of interest between Jews and gentiles over the construction of culture. This conflict of interests extends well beyond immigration policy. There is a growing realization that the counter-cultural revolution of the 1960s is a watershed event in the history of the United States. Such a conceptualization is compatible with the work of Roger Smith (1988), who shows that until the triumph of the cultural pluralist model with the counter-cultural revolution of the 1960s, there were three competing models of American identity: the "liberal" individualist legacy of the Enlightenment based on "natural rights"; the "republican" ideal of a cohesive, socially homogeneous society (what I have identified as the prototypical Western social

organization of hierarchic harmony); the "ethnocultural" strand emphasizing the importance of Anglo-Saxon ethnicity in the development and preservation of American cultural forms. . From the present perspective no fundamental conflict exists between the latter two sources of American identity; social homogeneity and hierarchic harmony may well be best and most easily achieved with an ethnically homogeneous society of peoples derived from the European cultural area. Indeed, in upholding Chinese exclusion in the nineteenth century, Justice Stephen A. Field noted that the Chinese were unassimilable and would destroy the republican ideal of social homogeneity. As indicated above, the incorporation of non-European peoples, and especially peoples derived from Africa, into peculiarly Western cultural forms is profoundly problematic. As discussed at several points in this volume, the radical individualism embodied in the Enlightenment ideal of individual rights is especially problematic as a source of long-term stability in a Western society because of the danger of invasion and domination by group strategies such as Judaism and the possibility of the defection of gentile elites from the ideals represented in the other two models of social organization. These latter two events are particularly likely to destroy the social cohesiveness so central to Western forms of social organization. As Smith notes, the transformations of American society in the post--Civil War era resulted from the "liberal" cultural ideal "that opposed slavery, favored immigration, and encouraged enterprise while protecting property rights" and that posed a severe threat to the collective life at the center of American civilization. It is this liberal legacy of American civilization that the Jewish intellectual movements reviewed in this volume have exploited in rationalizing unrestricted immigration and the loss of social homogeneity represented by the unifying force of the Christian religion. As Israel Zangwill said in advocating a Jewish strategy for unrestricted immigration, "tell them they are destroying American ideals" (see p. 267). The effect has been to create a new American ideal that is entirely at odds with the historic sources of American identity: "This ideal carries on the cosmopolitanism, tolerance, and respect for human liberty of the older liberal tradition, and so it can properly be termed a modern version of the liberal ideal. It is novel, however, in its rejection of Lockean liberalism's absolutist natural law elements in favor of modern philosophic pragmatism and cultural relativism. And one of its chief theoretical architects, philosopher Horace Kallen, argued that cultural pluralism better recognizes human sociality, our constitutive attachments to distinctive ethnic, religious, and cultural groups. It therefore envisions America as a "democracy of nationalities, cooperating voluntarily and autonomously through common institutions in the enterprise of self-realization through the perfection of men according to their kind" (Kallen 1924, 124). Since all groups and individuals should be guaranteed equal opportunities to pursue their own destinies, the nation's legacy of legal, racial, ethnic and gender discriminations is unacceptable according to the cultural pluralist ideal. At the same time, there must be no effort to transform equality into uniformity, to insist that all fit into a standard Americanized mold. The ideal of democratic cultural pluralism finally came to predominance in American public law in the 1950s and especially the 1960s, finding expression in the 1964 Civil Rights Act, the liberalizing 1965 Immigration and Naturalization Act, the 1965 Voting Rights Act, in new programs to provide educational curricula more attuned to the nation's diverse cultural heritage, in bilingual ballots and governmental publications, and in affirmative action measures. (Smith 1988, 246)" Within this perspective, there is tolerance for different groups but the result is a tendency to "deprecate

the importance or even the existence of a common national identity" (Kallen 1924, 59). Kallen, of course, was a very strongly identified Jew and a Zionist, and it is not at all surprising that his cultural ideal for the United States represents a non-Western form of social organization that conforms to Jewish interests and compromises the interests of the European-derived peoples of the United States. It is a social form that guarantees the continued existence of Judaism as a social category and as a cohesive ethnic group while at the same time, given the characteristics of Jews, guarantees Jews economic and cultural pre-eminence. Public policy based on this conceptualization is having the predictable long-term effect of marginalizing both culturally and demographically the European-derived peoples of the United States. Because the European-derived groups are less organized and less cohesive than Jews and because a therapeutic state has been erected to counter expressions of European-American ethnocentrism, it raises the distinct possibility that in the long run European Americans will be fragmented, politically powerless, and without an effective group identity at all. The conflict of interest between Jews and gentiles in the construction of culture goes well beyond advocacy of the multicultural ideal. Because they are much more genetically inclined to a high-investment reproductive strategy than are gentiles, Jews are able to maintain their high-investment reproductive strategy even in the absence of traditional Western cultural supports for high-investment parenting (Ch. 4). Compared to gentiles, Jews are therefore much better able to expand their economic and cultural success without these traditional Western cultural supports. As Higham (1984, 173) notes, the cultural idealization of an essentially Jewish personal ethic of hedonism, anxiety, and intellectuality came at the expense of the older rural ethic of asceticism and sexual restraint. Moreover, traditional Western supports for high-investment parenting were embedded in religious ideology and, I suppose, are difficult to achieve in a postreligious environment. Nevertheless, as Podhoretz (1995, 30) notes, it is in fact the case that Jewish intellectuals, Jewish organizations like the AJCongress, and Jewish-dominated organizations such as the ACLU have ridiculed Christian religious beliefs, attempted to undermine the public strength of Christianity, or have led the fight for lifting restrictions on pornography. Further, we have seen that psychoanalysis as a Jewish-dominated intellectual movement has been a central component of this war on gentile cultural supports for high-investment parenting. Whereas Jews, because of their powerful genetically influenced propensities for intelligence and high-investment parenting, have been able to thrive within this cultural milieu, other sectors of the society have not; the result has been a widening gulf between the cultural success of Jews and gentiles and a disaster for society as a whole. The countercultural revolution of the 1960s may well be incompatible with traditional American freedoms. Traditional American freedoms such as the First Amendment freedom of speech (deriving from the Enlightenment liberal strand of American identity) have clearly facilitated specifically Jewish interests in the construction of culture, interests that conflict with the possibility of constructing a cohesive society built around high-investment parenting. Given that the popular media and the current intellectual environment of universities thrive on the freedom of elites to produce socially destructive messages, the political movements attempting to restore the traditional Western cultural supports for high-investment parenting will undoubtedly be forced to restrict some traditional American freedoms (see, e.g., Bork 1996). Cultural supports for high-investment parenting act as external forces of social control that maximize high-investment parenting among all segments

of the population, even those who for genetic or environmental reasons are relatively disinclined to engage in such practices (MacDonald 1997, 1998b). Without such cultural controls, it is absolutely predictable that social disorganization will increase and the society as a whole will continue to decline. Nevertheless, the continuity of peculiarly Western forms of social organization will remain a salient concern even if one ignores issues of ethnic competition entirely. I have emphasized that there is an inherent conflict between multiculturalism and Western universalism and individualism. Even were Western universalism to regain its moral imperative, whether all of humanity is willing or able to participate in this type of culture remains an open question. Universalism is a European creation, and it is unknown whether such a culture can be continued over a long period of time in a society that is not predominantly ethnically European. When not explicitly advocating multiculturalism, the rhetoric in favor of immigration has typically assumed a radical environmentalism in which all humans are portrayed as having the same potentials and as being equally moldable into functioning members of Western universalist and individualist societies. This premise is highly questionable. Indeed, one might say that the present volume in conjunction with PTSDA and SAID is testimony to the extremely ingrained anti-Western tendencies that occur among human groups. Given that a great many human cultures bear a strong resemblance to the collectivist, anti-assimilatory tendencies present in Jewish culture, it is highly likely that many of our present immigrants are similarly unable or unwilling to accept the fundamental premises of a universalistic, culturally homogeneous, individualistic society. Indeed, there is considerable reason to suppose that Western tendencies toward individualism are unique and based on evolved psychological adaptations (see PTSDA, Ch. 8). This genetic perspective proposes that individualism, like many other phenotypes of interest to evolutionists (MacDonald 1991), shows genetic variation. In PTSDA (Ch. 8) I speculated that the progenitors of Western populations evolved in isolated groups with low population density. Such groups would have been common in northern areas characterized by harsh ecological conditions, such as those that occurred during the ice age (see Lenz 1931, 657). Under ecologically adverse circumstances, adaptations are directed more at coping with the physical environment than at competition with other groups (Southwood 1977, 1981). Such an environment implies less selection pressure for collectivist, ethnocentric groups as embodied by historical Judaism. Evolutionary conceptualizations of ethnocentrism emphasize the utility of ethnocentrism in group competition. Ethnocentrism would be of no importance in combating the physical environment, and such an environment would not support large groups. We have seen that Western individualism is intimately entwined with scientific thinking and social structures based on hierarchic harmony, sexual egalitarianism, and democratic and republican forms of government. These uniquely Western tendencies suggest that reciprocity is a deeply ingrained Western tendency. Western political forms from the democratic and republican traditions of ancient Greece and Rome to the hierarchic harmony of the Western Middle Ages and to modern democratic and republican governments assume the legitimacy of a pluralism of individual interests. Within these social forms is a tendency to assume the legitimacy of others' interests and perspectives in a manner that is foreign to collectivist, despotic social structures characteristic of much of the rest of the world. Another critical component of the evolutionary basis of individualism is the elaboration of the human affectional system as an individualistic pair-bonding system, the system that

seemed so strange that it was theorized to be a thin veneer overlaying a deep psychopathology to a generation of Jewish intellectuals emerging from the ghetto (Cuddihy 1974, 71). This system is individualistic in the sense that it is based not on external, group-based social controls or familial dictate but, rather, on the intrinsically motivated role of romantic love in cementing reproductive relationships (see pp. 136--139). The issue is important because Western cultures are typically characterized as relatively individualistic compared to other societies (Triandis 1995), and there is reason to suppose that the affectional system is conceptually linked to individualism; that is, it is a system that tends toward nuclear rather than extended family organization. Triandis (1990) finds that individualistic societies emphasize romantic love to a greater extent than do collectivist societies, and Western cultures have indeed emphasized romantic love more than other cultures (see PTSDA, 236-245; MacDonald 1995b,c; Money 1980). This system is highly elaborated in Western cultures in both men and women, and it is psychometrically linked with empathy, altruism, and nurturance. Individuals who are very high on this system--predominantly females--are pathologically prone to altruistic, nurturant and dependent behavior (see MacDonald 1995a). On an evolutionary account, the relatively greater elaboration of this system in females is to be expected, given the greater female role in nurturance and as a discriminating mechanism in relationships of pair bonding. Such a perspective also accounts for the much-commented-on gender gap in political behavior in which females are more prone to voting for political candidates favoring liberal positions on social issues. Women more than men also endorse political stances that equalize rather than accentuate differences between individuals and groups (Pratto, Stallworth & Sidanius 1997). In ancestral environments this system was highly adaptive, resulting in a tendency toward pair bonding and high-investment parenting, as well as intrinsically motivated relationships of close friendship and trust. This system continues to be adaptive in the modern world in its role in underlying high-investment parenting, but it is easy to see that the relative hypertrophy of this system may result in maladaptive behavior if a system designed for empathy, altruism, and nurturance of family members and others in a closely related group becomes directed to the world outside the family. The implication is that Western societies are subject to invasion by non-Western cultures able to manipulate Western tendencies toward reciprocity, egalitarianism, and close affectional relationships in a manner that results in maladaptive behavior for the European-derived peoples who remain at the core of all Western societies. Because others' interests and perspectives are viewed as legitimate, Western societies have uniquely developed a highly principled moral and religious discourse, as in the arguments against slavery characteristic of the nineteenth-century abolitionists and in the contemporary discourse on animal rights. Such discourse is directed toward universal moral principles--that is, principles that would be viewed as fair for any rational, disinterested observer. Thus in his highly influential volume, *Theory of Justice*, John Rawls (1971) argues that justice as objective morality can only occur behind a "veil of ignorance" in which the ethnic status of the contending parties is irrelevant to considerations of justice or morality. It is this intellectual tradition that has been effectively manipulated by Jewish intellectual activists, such as Israel Zangwill and Oscar Handlin, who have emphasized that in developing immigration policy Western principles of morality and fair play make it impossible to discriminate against any ethnic group or any individual. Viewed from the perspective of, say, an African native of Kenya, any policy that discriminates in favor of

Northwestern Europe cannot withstand the principle that the policy be acceptable to a rational, disinterested observer. Because Zangwill and Handlin are not constrained by Western universalism in their attitudes toward their own group, however, they are able to ignore the implications of universalistic thinking for Zionism and other expressions of Jewish particularism. Because of its official policy regarding the genetic and cultural background of prospective immigrants, Israel would not be similarly subject to invasion by a foreign group strategy. Indeed, one might note that despite the fact that a prominent theme of anti-Semitism has been to stress negative personality traits of Jews and their willingness to exploit gentiles (SAID, Ch. 2), a consistent theme of Jewish intellectual activity since the Enlightenment has been to cast Jewish ethnic interests and Judaism itself as embodying a unique and irreplaceable moral vision (SAID, Chs. 6-8)--terms that emphasize the unique appeal of the rhetoric of the morality of the disinterested observer among Western audiences. The result is that whether Western individualistic societies are able to defend the legitimate interests of the European-derived peoples remains questionable. A prominent theme appearing in several places in this volume and in PTSDA (Ch. 8) and SAID (Chs. 3--5) is that individualistic societies are uniquely vulnerable to invasion by cohesive groups such as has been historically represented by Judaism. Significantly, the problem of immigration of non-European peoples is not at all confined to the United States but represents a severe and increasingly contentious problem in the entire Western world and nowhere else: Only European-derived peoples have opened their doors to the other peoples of the world and now stand in danger of losing control of territory occupied for hundreds of years. Western societies have traditions of individualistic humanism, which make immigration restriction difficult. In the nineteenth century, for example, the Supreme Court twice turned down Chinese exclusion acts on the basis that they legislated against a group, not an individual (Petersen 1955, 78). The effort to develop an intellectual basis for immigration restriction was tortuous; by 1920 it was based on the legitimacy of the ethnic interests of Northwestern Europeans and had undertones of racist thinking. Both these ideas were difficult to reconcile with the stated political and humanitarian ideology of a republican and democratic society in which, as Jewish pro-immigration activists such as Israel Zangwill emphasized, racial or ethnic group membership had no official intellectual sanction. The replacement of these assertions of ethnic self-interest with an ideology of "assimilability" in the debate over the McCarran-Walter act was perceived by its opponents as little more than a smokescreen for "racism." At the end, this intellectual tradition collapsed largely as a result of the onslaught of the intellectual movements reviewed in this volume, and so collapsed a central pillar of the defense of the ethnic interests of European-derived peoples. The present tendencies lead one to predict that unless the ideology of individualism is abandoned not only by the multicultural minorities (who have been encouraged to pursue their group interests by a generation of American intellectuals) but also by the European-derived peoples of Europe, North America, New Zealand, and Australia, the end result will be a substantial diminution of the genetic, political, and cultural influence of these peoples. It would be an unprecedented unilateral abdication of such power and certainly an evolutionist would expect no such abdication without at least a phase of resistance by a significant segment of the population. As indicated above, European-derived peoples are expected to ultimately exhibit some of the great flexibility that Jews have shown throughout the ages in advocating particular political forms that best suit their

current interests. The prediction is that segments of the European-derived peoples of the world will eventually realize that they have been ill-served and are being ill-served both by the ideology of multiculturalism and by the ideology of deethnicized individualism. If the analysis of anti-Semitism presented in SAID is correct, the expected reaction will emulate aspects of Judaism by adopting group-serving, collectivist ideologies and social organizations. The theoretically underdetermined nature of human group processes (PTSDA, Ch. 1; MacDonald 1995b) disallows detailed prediction of whether the reactive strategy will be sufficient to stabilize or reverse the present decline of European peoples in the New World and, indeed, in their ancestral homelands; whether the process will degenerate into a selfdestructive reactionary movement as occurred with the Spanish Inquisition; or whether it will initiate a moderate and permanent turning away from radical individualism toward a sustainable group strategy. What is certain is that the ancient dialectic between Judaism and the West will continue into the foreseeable future. It will be ironic that, whatever anti-Semitic rhetoric may be adopted by the leaders of these defensive movements, they will be constrained to emulate key elements of Judaism as a group evolutionary strategy. Such strategic mimicry will, once again, lead to a "Judaization" of Western societies not only in the sense that their social organization will become more group-oriented but also in the sense that they will be more aware of themselves as a positively evaluated ingroup and more aware of other human groups as competing, negatively evaluated outgroups. In this sense, whether the decline of the European peoples continues unabated or is arrested, it will constitute a profound impact of Judaism as a group evolutionary strategy on the development of Western societies. This book is the final volume in the series on Judaism as a group evolutionary strategy. A future comparative book, tentatively titled *Diaspora Peoples*, extends the focus to groups other than Jews and European peoples--the Romany, Assyrians, overseas Chinese, Parsis, and Sikhs, among others. It will test the extent to which the concepts and analyses employed in this series expand our understanding of group interaction, cooperation, and competition, and therefore human evolution in general.

Racial differences in Intelligence - What Mainstream Science says

This public statement, signed by 52 internationally known scholars, was active on the information highway early in 1995 following several rather heated and negative responses to Herrnstein & Murray's *The Bell Curve*. It was first published in *The Wall Street Journal*, Tuesday, December 13, 1994. An alphabetical listing of the scholars and their home institutions are given at the end of the statement.

- * Prologue
- * The Meaning and Measurement of Intelligence
- * Group Differences
- * Practical Importance
- * Source and Stability of Within-Group Differences
- * Source and Stability of Between-Group Differences
- * Implications for Social Policy

Prologue

Since the publication of "*The BELL CURVE*," many commentators have offered opinions about human intelligence that misstate current scientific evidence. Some conclusions dismissed in the media as discredited are actually firmly supported.

This statement outlines conclusions regarded as mainstream among researchers on intelligence, in particular, on the nature, origins, and practical consequences of individual and group differences in intelligence. Its aim is to promote more reasoned discussion of the vexing phenomenon that the research has revealed in recent decades. The following conclusions are fully described in the major textbooks, professional journals and encyclopedias in intelligence.

The Meaning and Measurement of Intelligence

1. Intelligence is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking

smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings -- "catching on," "making sense" of things, or "figuring out" what to do.

2. Intelligence, so defined, can be measured, and intelligence tests measure it well. They are among the most accurate (in technical terms, reliable and valid) of all psychological tests and assessments. They do not measure creativity, character, personality, or other important differences among individuals, nor are they intended to.

3. While there are different types of intelligence tests, they all measure the same intelligence. Some use words or numbers and require specific cultural knowledge (like vocabulary). Others do not, and instead use shapes or designs and require knowledge of only simple, universal concepts (many/few, open/closed, up/down).

4. The spread of people along the IQ continuum, from low to high, can be represented well by the BELL CURVE (in statistical jargon, the "normal CURVE"). Most people cluster around the average (IQ 100). Few are either very bright or very dull: About 3% of Americans score above IQ 130 (often considered the threshold for "giftedness"), with about the same percentage below IQ 70 (IQ 70-75 often being considered the threshold for mental retardation).

5. Intelligence tests are not culturally biased against American blacks or other native-born, English-speaking peoples in the U.S. Rather, IQ scores predict equally accurately for all such Americans, regardless of race and social class. Individuals who do not understand English well can be given either a nonverbal test or one in their native language.

6. The brain processes underlying intelligence are still little understood. Current research looks, for example, at speed of neural transmission, glucose (energy) uptake, and electrical activity of the brain.

Group Differences

1. Members of all racial-ethnic groups can be found at every IQ level. The BELL CURVES of different groups overlap considerably, but groups often differ in where their members tend to cluster along the IQ line. The BELL CURVES for some groups (Jews and East Asians) are centered somewhat higher than for whites in general. Other groups (blacks and Hispanics) are centered somewhat lower than non-Hispanic whites.

2. The BELL CURVE for whites is centered roughly around IQ 100; the BELL CURVE for American blacks roughly around 85; and those for different subgroups of Hispanics roughly midway between those for whites and blacks. The evidence is less definitive for exactly where above IQ 100 the BELL CURVES for Jews and Asians are centered.

Practical Importance

1. IQ is strongly related, probably more so than any other single measurable human trait, to many important educational, occupational, economic, and social outcomes. Its relation to the welfare and performance of individuals is very strong in some arenas in life (education, military training), moderate but robust in others (social competence), and modest but consistent in others (law-abidingness). Whatever IQ tests measure, it is of great practical and social importance.
2. A high IQ is an advantage in life because virtually all activities require some reasoning and decision-making. Conversely, a low IQ is often a disadvantage, especially in disorganized environments. Of course, a high IQ no more guarantees success than a low IQ guarantees failure in life. There are many exceptions, but the odds for success in our society greatly favor individuals with higher IQs.
3. The practical advantages of having a higher IQ increase as life settings become more complex (novel, ambiguous, changing, unpredictable, or multi-faceted). For example, a high IQ is generally necessary to perform well in highly complex or fluid jobs (the professions, management); it is a considerable advantage in moderately complex jobs (crafts, clerical and police work); but it provides less advantage in settings that require only routine decision making or simple problem solving (unskilled work).
4. Differences in intelligence certainly are not the only factor affecting performance in education, training, and highly complex jobs (no one claims they are), but intelligence is often the most important. When individuals have already been selected for high (or low) intelligence and so do not differ as much in IQ, as in graduate school (or special education), other influences on performance loom larger in comparison.
5. Certain personality traits, special talents, aptitudes, physical capabilities, experience, and the like are important (sometimes essential) for successful performance in many jobs, but they have narrower (or unknown) applicability or "transferability" across tasks and settings compared with general intelligence. Some scholars choose to refer to these other human traits as other "intelligences."

Source and Stability of Within-Group Differences

1. Individuals differ in intelligence due to differences in both their environments and genetic heritage. Heritability estimates range from 0.4 to 0.8 (on a scale from 0 to 1), most thereby indicating that genetics plays a bigger role than does environment in creating IQ differences among individuals. (Heritability is the squared correlation of phenotype with genotype.) If all environments were to become equal for everyone, heritability would rise to 100% because all remaining differences in IQ would necessarily be genetic in origin.

2. Members of the same family also tend to differ substantially in intelligence (by an average of about 12 IQ points) for both genetic and environmental reasons. They differ genetically because biological brothers and sisters share exactly half their genes with each parent and, on the average, only half with each other. They also differ in IQ because they experience different environments within the same family.

3. That IQ may be highly heritable does not mean that it is not affected by the environment. Individuals are not born with fixed, unchangeable levels of intelligence (no one claims they are). IQs do gradually stabilize during childhood, however, and generally change little thereafter.

4. Although the environment is important in creating IQ differences, we do not know yet how to manipulate it to raise low IQs permanently. Whether recent attempts show promise is still a matter of considerable scientific debate.

5. Genetically caused differences are not necessarily irremediable (consider diabetes, poor vision, and phenylketonuria), nor are environmentally caused ones necessarily remediable (consider injuries, poisons, severe neglect, and some diseases). Both may be preventable to some extent.

Source and Stability of Between-Group Differences

1. There is no persuasive evidence that the IQ BELL CURVES for different racial-ethnic groups are converging. Surveys in some years show that gaps in academic achievement have narrowed a bit for some races, ages, school subjects and skill levels, but this picture seems too mixed to reflect a general shift in IQ levels themselves.

2. Racial-ethnic differences in IQ BELL CURVES are essentially the same when youngsters leave high school as when they enter first grade. However, because bright youngsters learn faster than slow learners, these same IQ differences lead to growing disparities in amount learned as youngsters progress from grades one to 12. As large national surveys continue to show, black 17-year-olds perform, on the average, more like white 13-year-olds in reading, math, and science, with Hispanics in between.

3. The reasons that blacks differ among themselves in intelligence appear to be basically the same as those for why whites (or Asians or Hispanics) differ among themselves. Both environment and genetic heredity are involved.

4. There is no definitive answer to why IQ bell curves differ across racial-ethnic groups. The reasons for these IQ differences between groups may be markedly different from the reasons for why individuals differ among themselves within any particular group (whites or blacks or Asians). In fact, it is wrong to assume, as many do, that the reason why some individuals in a population have high IQs but others have low IQs must be the same reason why some

populations contain more such high (or low) IQ individuals than others. Most experts believe that environment is important in pushing the bell curves apart, but that genetics could be involved too.

5. Racial-ethnic differences are somewhat smaller but still substantial for individuals from the same socioeconomic backgrounds. To illustrate, black students from prosperous families tend to score higher in IQ than blacks from poor families, but they score no higher, on average, than whites from poor families.

6. Almost all Americans who identify themselves as black have white ancestors -- the white admixture is about 20%, on average -- and many self-designated whites, Hispanics, and others likewise have mixed ancestry. Because research on intelligence relies on self-classification into distinct racial categories, as does most other social-science research, its findings likewise relate to some unclear mixture of social and biological distinctions among groups (no one claims otherwise).

Implications for Social Policy

1. The research findings neither dictate nor preclude any particular social policy, because they can never determine our goals. They can, however, help us estimate the likely success and side-effects of pursuing those goals via different means.

The following professors — all experts in intelligence and allied fields — have signed this statement:

- * Richard D. Arvey, University of Minnesota
- * Thomas J. Bouchard, Jr., University of Minnesota
- * John B. Carroll, Un. of North Carolina at Chapel Hill
- * Raymond B. Cattell, University of Hawaii
- * David B. Cohen, University of Texas at Austin
- * Rene V. Dawis, University of Minnesota
- * Douglas K. Detterman, Case Western Reserve Un.

- * Marvin Dunnette, University of Minnesota
- * Hans Eysenck, University of London
- * Jack Feldman, Georgia Institute of Technology
- * Edwin A. Fleishman, George Mason University
- * Grover C. Gilmore, Case Western Reserve University
- * Robert A. Gordon, Johns Hopkins University
- * Linda S. Gottfredson, University of Delaware
- * Robert L. Greene, Case Western Reserve University
- * Richard J. Haier, University of California at Irvine
- * Garrett Hardin, University of California at Berkeley
- * Robert Hogan, University of Tulsa
- * Joseph M. Horn, University of Texas at Austin
- * Lloyd G. Humphreys, University of Illinois at Urbana-Champaign
- * John E. Hunter, Michigan State University
- * Seymour W. Itzkoff, Smith College
- * Douglas N. Jackson, Un. of Western Ontario
- * James J. Jenkins, University of South Florida
- * Arthur R. Jensen, University of California at Berkeley
- * Alan S. Kaufman, University of Alabama
- * Nadeen L. Kaufman, California School of Professional Psychology at San Diego

- * Timothy Z. Keith, Alfred University
- * Nadine Lambert, University of California at Berkeley
- * John C. Loehlin, University of Texas at Austin
- * David Lubinski, Iowa State University
- * David T. Lykken, University of Minnesota
- * Richard Lynn, University of Ulster at Coleraine
- * Paul E. Meehl, University of Minnesota
- * R. Travis Osborne, University of Georgia
- * Robert Perloff, University of Pittsburgh
- * Robert Plomin, Institute of Psychiatry, London
- * Cecil R. Reynolds, Texas A & M University
- * David C. Rowe, University of Arizona
- * J. Philippe Rushton, Un. of Western Ontario
- * Vincent Sarich, University of California at Berkeley
- * Sandra Scarr, University of Virginia
- * Frank L. Schmidt, University of Iowa
- * Lyle F. Schoenfeldt, Texas A & M University
- * James C. Sharf, George Washington University
- * Herman Spitz, former director E.R. Johnstone Training and Research Center, Bordentown, N.J.
- * Julian C. Stanley, Johns Hopkins University

- * Del Thiessen, University of Texas at Austin
- * Lee A. Thompson, Case Western Reserve University
- * Robert M. Thorndike, Western Washington Un.
- * Philip Anthony Vernon, Un. of Western Ontario
- * Lee Willerman, University of Texas at Austin

Conway Zirkle and the Persistence of "Marxian Biology" in the Western Social Sciences

J.W. JAMIESON

Institute for the Study of Man

In 1948 the Soviet Union stunned the world with its denunciation of the science of genetics and its searing criticism of Charles Darwin's theory of natural selection. To those who were familiar with the ideology of Karl Marx and Friedrich Engels, this was not entirely unexpected - the repudiation of genetics could be directly attributed to the incompatibility of its doctrines with those of Marx and Engels.

This twisting of science 'although subsequently discredited even in the Soviet Union with the disgrace of the Soviet pseudoscientist Trofim D. Lysenko, has nevertheless had a disastrous influence on sociological thought in the Western world. Western sociologists of the Lester Ward mold, who were already ideologically prejudiced against concepts of biological inequality among men - both as individuals and as groups - willingly allowed "Marxian biology" to permeate their thinking, and in consequence the erroneous concepts of Lysenko, while long since abandoned by geneticists throughout the world (including even those in the U.S.S.R.), still distort the context of many of the social science textbooks used in our contemporary universities.

The first Western schools to clearly identify the extent of Marxist pseudo-genetic infiltration into the social sciences was Conway Zirkle, a distinguished biologist who was a member of a number of university faculties in the course of his career, notably Virginia, Johns Hopkins, Harvard and Pennsylvania. A member of the editorial boards of *Isis*, *Botanical Review* and *The American Naturalist*, Conway Zirkle authored several books, but particularly pinpointed the nature of Marxian pseudo-genetics in his *Death of a Science in Russia*. (1) In this he showed how the Marxist dedication to the concept of equality had caused pseudo-scientific theories, rooted only in political dogma, to dominate the field of genetics in the Soviet Union, with the intention of downplaying the inherent genetic differences (i.e., inequalities) that distinguished all complex living organism from each other, by claiming to show that the genetic heritage of the individual organism could be modified by environmental forces.

But it was Zirkle's *Evolution, Marxian Biology and the Social Scene*(2) which first revealed the extent to which this pernicious biological cult had influenced Western social scientists. Marxian biology dates from the 1860s when Marx and Engels first read Darwin's *Origin of Species*. Although the founders of communism were Willing to accept the concept of evolution, they categorically rejected all parts of the theory which conflicted with the ideals of a socialistic society and extended their party line right through the science of biology.

As Conway Zirkle points out in this Study, it was the recrudescence of this line that enabled Lysenko to annihilate all traces of the science of genetics in the Communist world. But what is of even greater importance to us today is the influence of this "Marxian biology" on a number of the attitudes and beliefs of American scholars who are unaware of its permeating forces because of our modern intellectual specialization and consequent fragmentary knowledge.

In order to alleviate the heretofore unchallenged status of "Marxian biology" as present in the American culture, Dr. Zirkle cited examples of its pervasive influence on American literature and sociology. He showed how a "quackery has penetrated into our scholarly world," limiting our information and affecting our thinking. So that the reader who is not a professional biologist may make an informed judgment, the author also included a brief history of the theory of evolution - which has been distorted by the Marxians - from the time of Darwin to the present.

There can be no doubt that the influence of those who oppose the application of the findings of biological and genetic research to the understanding of human social behavior was greatly enhanced by the temporary fashion for "Social Darwinism" at the turn of the century, with its erroneous emphasis upon individual competition in evolution to the exclusion of group competition. Social Darwinists did not see that cooperation within the group enhanced the competitiveness of the group in its struggle for survival against other groups - and that altruism and loyalty were powerful forces for the survival of the group, race or lineage. The fact that altruism has survival value, when practiced in favor of members of the altruist's own gene pool, was not apparent to the Social Darwinists, who did not fully realize that from the evolutionary point of view it is the gene pool, the race or lineage which is important, not the individual per se. This defect in primitive Social Darwinists thinking made it easier for Marxian social philosophers to downplay the significance of biological forces to the human social system and to promote instead their own distorted concepts of direct genetic subordination to environmental forces. Darwin himself, of course was not a "Social Darwinist" in that he never meant anyone to assume that all competition took place strictly at the level of individuals. Indeed, the influence of marxian biologists has been such that we almost always hear his major work referred to simply as "The Origin of Species by Means of Natural Selection." Even Karl Marx looked with approval on Darwin's thought in so far as this short title is an imperfect representation of Darwin's own conception of the evolutionary process. Darwin's true comprehension of the evolutionary process, as involving group even more than individual competition at the higher levels of mammalian development, is revealed by the full title of his renowned book which is: "The Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life." Commenting on the impact of Marxian biology on Western thought, Conway Zirkle noted that:

Those who tried to advance Marxian biology consciously were not numerous, but their influence in shaping the ideals of our intelligentsia was tremendous. They actually set the fashion not only in letters but also in the popular up-to-date attitudes in morals and ethics. It is even possible that they furnished the dominant directives to the social sciences. This statement

is not as far-fetched as it might seem at first, for practically all social scientists are familiar with the works of the more progressive writers, but almost none of them is technically equipped to evaluate the new discoveries in biology.

Marxian biology has always had allies, and this has been one of the sources of its strength. On the other hand, scientific biology has had few friends. The moment it grew to the point where it applied to *Homo sapiens*, it acquired enemies. Indeed, for the last hundred and fifty years, the history of biology (outside of the history of its technical developments and discoveries) has been a history of conflict, and the conflict shows no signs of abating. For example, in 1925, a high school teacher in Tennessee was arrested for teaching evolution; and as late as 1948, five geneticists in Moscow were forced by the Communists to recant and forswear their knowledge of biology.

The proponents of Marxian biology appear in unexpected places. In the early disputes over evolution, the most effective aid to the Marxian line came from the humanitarian but conservative Christians, who not only rejected evolution on theological grounds, but who also looked with horror on the amoral viciousness of what they took to be natural selection. Marx himself had also objected to the competitive aspects of natural selection, so both his followers and the more conservative religious groups found themselves on the same side. In fact, the Marxian biologists of the last seventy-five years had their pathways made smooth by the Victorian fundamentalists. (3)

Penetration of Sociological Thought

Concerning sociology, Zirkle was even more critical: "The coexistence of our rapidly expanding sciences with stupid quack substitutes for science should surprise no one .. Marxian biology ... exists also in non-Communist countries - in countries where it is not protected by Marxian dictators. Moreover, it exists not merely as an intellectual lag among the unlearned, but as a carefully protected faith in disciplines whose members are equal in education - quantitatively at least - to the biologists themselves." (4)

Zirkle did not complain that contemporary Western sociologists ignored biology, but rather that they had become so deeply permeated by the propaganda of Marxian pseudobiology that: "The usual course is to treat the human species as if it were composed- of an amorphous, uniform and plastic raw material, as if it were a species which could be molded (conditioned is the usual word) to suit the heart's desire." (5) Most sociologists, he declares, are dedicated to the idea of "reform" along equalitarian lines, and find it easier to disapprove of biological variables and to accept Marxian pseudo-biology than to face the reality of biological complexity.

Admitting that there are some sociologists who have not fallen in this trap, Zirkle warns that "It is necessary, however, that we distinguish between sociology as it is understood by the cream of the professional sociologists and sociology as it is taught from elementary textbooks. Some

sociologists recognize the complexities of their subject and are fully aware of the tremendous difficulties which they will have to surmount before they can make the contributions which society needs. The more popular textbooks, however, give a very different picture of the field and this, of course, is very serious - even dangerous. If he knows anything at all, it is apt to be only what he learned in a single undergraduate course which was taught from an elementary textbook. It is textbook sociology which penetrates to our professional educators and which is included in the curricula of our teachers' colleges. It is textbook sociology which conditions the thinking of those who teach in the primary and secondary schools and thus, it is textbook sociology which influences, and which will continue to influence, the climate of opinion. It is textbook sociology which indoctrinates the run-of-the-mill college graduate and it is textbook sociology which orients our intelligentsia on social questions." (6)

Characteristics of Marxian Biology

The identifying characteristics of Marxist biology are numerous. Salient among these is the rejection of Malthusian doctrine. As Margaret Sanger admitted, "A remarkable feature of Marxian propaganda has been the almost complete unanimity with which the implications of the Malthusian doctrines have been derided, denounced, and repudiated. Any defense of the so-called 'Law of Population' was enough to stamp one, in the eyes of the orthodox Marxians, as a 'tool of the capitalistic class,' seeking to dampen the ardor of those who expressed the belief that men might create a better world for themselves. Malthus, they claimed, was actuated by selfish motives. He was not merely a hidebound aristocrat, but a pessimist who was trying to kill all hope of human progress. By Marx, Engels, Bebel, Kautsky and the celebrated leaders and interpreters of Marx's great 'Bible of the Working Class' ... birth control has been looked upon as a subtle Machiavelian sophistry created for the purpose of placing the blame for human misery elsewhere than at the door of the capitalistic class. Upon this point the orthodox Marxian mind has been universally and sternly uncompromising."(7)

Other key indicators of Marxist influence in the social science's attitude towards biological reality centers upon: 1) the refusal to recognize the role of population pressure in natural selection among contemporary human societies, 2) the insistence upon reintroducing Lysenkovian doctrines of the inheritance of acquired characteristics, 3) the insistence that evolution has ceased to play a significant role in human affairs 4) of the idea that all peoples are in any case made equal by culture.

Perhaps an equally important indicator of Marxian bias is the commitment of many Western sociologists to unwavering opposition to eugenics, "Negative eugenics, and indeed all kinds of eugenics, are anathema to Marxists of all types. In fact, eugenics impinges upon so many religious, political, and economic convictions that a great many individuals are unable to evaluate the subject honestly. Yet the questions involved are essentially simple. The program of negative eugenics is sound and based on valid research. Our knowledge of the machinery of heredity is now sufficient to enable us to foretell the outcome of the program and the outcome,

we know, would be beneficial ..."

"Negative eugenics, however, should not be scorned on the grounds that its benefits are biological rather than social. If the eugenics program is followed, the number of defectives will be decreased, fewer institutions would be needed for their care, and those institutions now in use would be less crowded. Uninstitutionalized defectives, those who now wander at large, would also be fewer and could be given better care with the present overall expenditure of energy, and the burden on society would be greatly lessened. Thus, the prescriptions of negative eugenics, if followed, should result in some real social gain. Opposition to all eugenics seems rather silly. The program prescribed is simple; all that is needed is for recognizable genetic defectives not to reproduce."(8)

Finally Marxist influence in the contemporary social sciences is perhaps most evident in the persistent attempts of many contemporary social "scientists" to keep alive the meaningless "nature versus nurture" controversy, debating the relative importance of heredity and environment. Zirkle summed up this last noted issue succinctly when he wrote, "The biology embedded in the social sciences approaches closest to the biology of Marx and Engels when it attempts to evaluate the relative roles of heredity and environment as these two variables interact to produce the human differences which we see in those about us. Here, the sociologists postulate biological principles which have long been disproven and which are so far removed from the ignored recent discoveries that at present sociological biology" has almost nothing in common with the biology of the biologists. In fact, the two disciplines are so far apart that the pertinent biological theories should be restated if we are to compare the two conflicting systems. ... Any contrast of heredity with environment which presents one as more important than the other is completely meaningless. What we are depends 100 per cent on our heredity and also 100 per cent on our environment; change either and we are changed. Any attempt to make one more important than the other is as silly as trying to determine which is the more important in deriving a product, the multiplicand or the multiplier."(9)

1. Conway Zirkle, *Death of a Science in R@ Philadelphia*, 1949.
2. Conway Zirkle, *Evolution, Marxian Biology, and the Social Scene*, Philadelphia: University of Pennsylvania Press, 1959.
3. *Ibid.*, p. 298.
4. *Ibid.*, p. 418.
5. *Ibid.*, P. 420.
6. [*ibid.*, p. 429. Also Margaret Sanger, *The Pivot of Civilization*. New York.

7. Ibid., p. 272.

8. Ibid., p. 444.

Paternal Provisioning versus Mate-Seeking in Human Populations

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Abstract

Paternal investment theory suggests that in cold climates males were selected for provisioning, rather than for mating success. In warm climates, where female gathering made male provisioning unessential, selection was for mating success. Male hunted meat was essential for female winter survival. Genes that encouraged mating success were selected for in warm (was cold) climates. Negroids (blacks) evolved in warm cold climates, while Caucasians (whites) and Mongoloids (Asians) evolved in colder climates. Mating is assisted by a strong sex drive, aggression, dominance, sociability, extraversion, impulsiveness, sensation seeking, and high testosterone. Provisioning is assisted by anxiety, altruism, empathy, behavioral restraint, gratification delay, and a long life span. Explanations are offered for racial differences in many personality characteristics, hormone levels, monamine oxidase levels, testosterone levels, lactase dehydrogenase metabolic paths, life spans, prostate cancer rates, hypertension, genital (penis and testes) size, vocal frequencies, liver size, muscle structure, mesomorphy, bone density, sports performance, crime rates, rape, child abuse, earnings, age at first sexual activity, AIDs, illegitimacy, divorce, marriage, and polygyny rates. Eye color correlations are discussed. Negro family structure in the Caribbean and the U.S. may reflect selection in Africa during hunter-gather times. Comparison is made with differential K theory and father absence theories.

Key words: race, climate, evolution, personality, polygyny, aggression, provisioning, mating, dominance seeking, paternal investment

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Rushton (1985, 1987, 1988, 1989b, in press) and Ellis (1987) have drawn attention to the existence of many racial differences, including behavioral ones, and shown that they were frequently arranged in the order Mongoloid, Caucasoid, Negroid (or Negroid, Caucasoid, Mongoloid, depending on the trait). The differences Rushton drew attention to include twinning rates, (Negroids first, Caucasoids second, Mongoloids third), intelligence (Mongoloids first, Caucasoids second, Negroids third), various differences in aggression, dominance seeking, impulsivity, extraversion, sexual behavior, genital size (Negroids first, Caucasoids second, Mongoloids last), extent of altruism, and behavioral restraint (Mongoloids first, Caucasoids second, and Negroids last), and timing of birth, menarche, birth of first child, and death (Negroids earliest, Caucasoids second, Mongoloids last).

Rushton explains his observations by a version of r versus K selection theory. The terms r and K come from population biology, where r is a population's maximum growth rate, and K is the environment's carrying capacity. K selected species have been selected for success at competition with conspecifics. Species selected for fast reproduction with low ability to compete are called r selected. Rushton extends the idea to human populations. He argues that Negroids are the least K selected among human populations, Mongoloids the most K selected, and Caucasoids in between. This idea has produced considerable scientific (J. Anderson, 1991;

Flynn, 1989; Leslie, 1990; Lynn, 1989; Roberts & Gabor, 1990; Silverman, 1990; Weizmann, Wiener, Wiesenthal, & Ziegler, 1990; Zuckerman, 1991; Miller, 1993) and popular controversy (Gross, 1990; Pearson, 1991, Chap. 5; Lerner, 1992, pp. 139-147), to which Rushton (1989a, 1990a, 1990b, Rushton & Ankney, 1993) has responded. Chisholm (1993) has also applied life cycle theory to humans, arguing that early experiences with the correlates of high death rates affects the allocation between mating and parenting.

This paper will propose an alternative explanation to differential K theory. Like differential K theory, it will be derived from a standard biological theory, parental investment theory. In some species, males devote more effort to seeking mating opportunities. In other species, they devote more effort to assisting their offspring. In each species, males evolve to use the strategy that most promotes their fitness. Which strategy most promotes their fitness depends on the effect of paternal investment on offspring survival and fitness, and on the opportunities for obtaining reproductively successful additional matings (Katz & Konner, 1981; Clutton-Brock, 1991). Likewise, within the same species different populations have been selected for different positions on the paternal investment versus mating effort continuum.

In humans, an especially important form of paternal investment is provisioning, bringing the mother and child food. Offspring's benefit from provisioning depends on climate. In warm climates, females typically can gather enough food for themselves and their children. In cold climates, hunting is required to survive winter, and females typically do not hunt (other than for easily captured small game). Hence, offspring survival requires male provisioning in cold climates. Thus, cold climate males were selected to devote more efforts to provisioning, and less to seeking matings. In warm climates, such male provisioning was not essential, even if desirable. Thus, warm climate males who devoted more efforts to seeking mating opportunities, and less to provisioning, left more offspring. This theory can explain many of the known racial differences.

Paternal investment theory's chief advantage is its specificity as to the traits populations should exhibit. It makes specific testable predictions (which are generally sustained) as to how cold-adapted populations and tropical populations should behave. In contrast, Rushton's and Ellis's differential K theories, after stating that Mongoloids are most K selected, and Negroids least, are very vague as to why this is. They fail to predict how other races (Malays, Australian aborigines, Polynesians, etc), or populations within the major races, should differ (J. Anderson, 1991; Miller, 1993).

To limit this paper's length, a detailed treatment of the evidence for the racial differences discussed will not be attempted. The reader can find relevant references in Ellis (1987, p. 159) and in Rushton's papers (especially 1987, p. 1019, 1989a, p. 9) and in Rushton's forthcoming book (in press). The author has checked most of these. Although many of the individual studies could be improved on, the racial differences do appear to be as Rushton and Ellis depict them. Strong evidence as to whether most racial differences in behavior are of environmental or

genetic origin is lacking. While cultural explanations have been proposed for many of the behavioral differences, (but not for the morphological, or biochemical ones), there is not space to discuss them here. Occasionally, when new evidence has appeared since Rushton and Ellis wrote, it will be noted.

This paper combines several generally accepted ideas from different disciplines. It accepts the evidence from human behavior genetics that most personality traits have an inherited component (for instance Eaves, Eysenck & Martin, 1989; or Bouchard, Lykken, McGue, Segal, & Tellegen, 1990, or Rushton, in press, chap. 4). From biology and population genetics, it takes natural selection. From physical anthropology, it takes the theory that humans have been separated into races long enough to have evolved somewhat different appearances, many of which can be traced to climatic differences. From sociobiology, it takes the idea that males differ in the extent to which they devote their efforts to mating versus parenting, and that basic human behavior traits evolved during the hunter-gatherer 99% of human history (Barash, 1977; E. Wilson, 1975). It extends this by arguing that cold weather hunter-gatherers evolved into Mongoloids and Caucasoids, and tropical African hunter-gatherers into Negroids, and that differences in morphological and behavioral gene frequencies can be explained by the climatic differences during hunter-gatherer times.

MALE COMPETITION FOR MATING OPPORTUNITIES

In many species, much male behavior consists of competition for females (Barash, 1977; Wilson, 1975; Trivers, 1972). This seems to be true of humans. Standard sociobiology explains differences between human male and female behavior by contrasting the male's ability to father children by several females with the female's inability to have children by more than one male at a time (Symons, 1979; Hrdy, 1981). Thus, men evolved to exploit any impregnation opportunities that arise, while women direct their copulations to males who are willing and able to invest in them and their children.

Thus, in discussing male behavior across species, biologists argue that males evolved a trade-off between paternal investment and mating efforts that maximizes their inclusive fitness for that environment (Draper, 1989, pp. 149-150). The argument generalizes easily to explain differences in male mating and paternal investment within a single species, such as humans.

Under some conditions males leave more descendants by devoting more energy to seeking copulations (an endeavor that often includes prestige seeking), and relatively less to provisioning their offspring. In these conditions, selection will be for such characteristics as high sex drive, aggression, a mesomorphic body build, and large testes. In these conditions females can raise children with only limited male provisioning.

In other circumstances, males are selected for extensive provisioning of their children. This normally implies less energy being devoted to seeking matings for two reasons. First, energy and

resources devoted to seeking additional matings would be diverted from provisioning their mates and children, thus reducing the number of surviving children. Secondly, added matings would frequently produce children able to survive only if resources were diverted from the father's other children. The net gain in surviving offspring would be small, or even negative. The first effect of devoting more energy to mating is to reduce total male investment in offspring, while the second spreads it among more offspring, reducing per capita investment.

I will argue that selection for male provisioning is especially common in climates with cold winters, where large game hunting is required for survival. Children of males who failed to provision would often not survive the winter.

Physical anthropologists can explain many racial variations as climatic adaptations (Baker, 1974; Coon, 1965, 1982; Krantz, 1980; Roberts, 1978). For instance, in northern latitudes, winter ultraviolet radiation intensity is low, and pale skin permits maximum vitamin D production. In low latitudes, there is a risk of excess vitamin D production and sunburn. Here dark skin is optimal (see Robins, 1991). Likewise, variations in adult ability to tolerate lactose has been interpreted as partially an adaptation to low levels of ultraviolet radiation (Durham, 1991). Lynn (1991b) has contrasted the hunting required for survival in cold climates, in which Mongoloids and Caucasoids evolved, with the tropical gathering. He used this to explain the racial intelligence differences he had earlier documented (Lynn, 1991a). Here, this difference in reliance on hunting will be used to explain many other behavioral differences.

The reader will probably have little difficulty in accepting that Negroids evolved in the tropics, and Caucasoids and Mongoloids in colder climates. However, some may wonder why the Mongoloids are considered to have evolved in a colder climate than did the Caucasoids. One reason is that certain Mongoloid features (a stocky body build, and distinctive eye folds) appear to be adaptations to arctic conditions (Baker, 1974; Coon, 1965, 1982; Krantz, 1980; Roberts, 1978).

Admittedly, Europe is also cold. However, it is believed that farming started in the Middle East and then spread with the farmers' migration into Europe. This conclusion comes from archaeology and a northwest to southeast distribution of certain genes (Menozzi, Piazza, & Cavalli-Sforza, 1978; Piazza, 1993; Sokal, Oden, & Wilson, 1991). The latter suggests a population movement, rather than merely technology diffusion. The result is that some European ancestors were Middle Eastern hunter-gatherers, rather than hunter-gatherers who had evolved where the populations now live.

HUNTING AS A FUNCTION OF LATITUDE

Richard Lee (1968, pp. 42-43) in the widely cited *Man the Hunter* book emphasized that most calories eaten among typical (tropical) hunter-gatherers come from gathering, leaving the impression that gathering was the primary subsistence mode for the ancestors of most peoples.

However, this really held only for the well studied inhabitants of warm and tropical areas, which are the majority of surviving hunter-gatherers. He reports that "In warm-temperature, sub-tropical, and tropical latitudes, zero to thirty-nine degrees from the equator, gathering is by far the dominant mode of subsistence, appearing as primary in 25 of the 28 cases." He found that 6 of the 8 societies whose latitude exceeded 60 degrees relied primarily on hunting. Eskimos (Inuits) are classic examples. In cool to cold temperature latitudes, from 40-59, degrees fishing was the most common subsistence mode. Temperature tells the same story, "Hunting is primary in three of the five societies in very cold climates (annual temperatures less than 32 F0.), fishing is primary in 10 of the 17 societies in cold climates (32-50 F0.): and gathering is primary in 27 of 36 societies in mild to hot climates (over 50 F0.)."

Fishing (usually male) appears to be a relatively recent development (Washburn & Lancaster, 1968, p. 294). In earlier times, before the most fertile mid-latitude lands were cleared for farming, there was probably more mid-latitude hunting. The hunting of large sea mammals from boats, so important to Eskimos, developed relatively recently.

Especially significant in the Lee tabulation (p. 43) is the absence of any predominantly gathering society above 500 latitude. Gathering is the primary way a single mother can feed her family.

The above tabulations suggest that ancestral Negroids relied on gathered vegetable material and ancestral Caucasoids and Mongoloids relied on animal matter from hunting and fishing. Supporting evidence is provided by blacks' greater current salt retention compared to whites (Luft et al., 1991). Presumably, the lower salt content of the prehistoric low meat African diet, combined with greater sweat loss, selected for salt retention.

Another piece of evidence consistent with the environment of evolutionary adaptation for Caucasoids involving more meat eating than Negroids' original environment is that the Negroids' livers are smaller (Lewis, 1942, p. 276). The liver's function is to produce bile, which is used in fat digestion. A diet lower in fats (which are much more common in animal foods) would require less bile for digestion.

The obvious problems of hunting while pregnant or with a small child assure that males do the hunting (for other than small and slow game) in virtually all societies (Friedl, 1975, p. 16-18; Watanabe, 1968).*(1) In climates typical of those now prevailing north of 500 a woman would have difficulty raising children without male supplied meat.

An example of women hunting small game is provided by the Twi of Melville Island, Australia (Goodale, 1971, pp. 151-169). They commonly hunt lizards, snakes, crabs, rats, and opossum and bandicoot. The last two are small animals found sleeping in logs or hollow trees, and typically are easily killed where found (i.e. without pursuit). In northern climates most such small animals would be hibernating during winter, or would be rare then.

The Hadza of Tanzania are typical tropical hunter-gatherers. Woodburn (1968, p. 52) describes the abundance of game and other food, stating, "For a Hadza to die of hunger, or even to fail to satisfy his hunger for more than a day or two, is almost inconceivable."

Barnard and Woodburn (1988) noted that, "In all known hunter-gatherer societies, with immediate return systems, and in many but not all, hunter-gatherer societies with delayed return systems, people are almost always able to meet their nutritional needs very adequately without working long hours." If gathering permits this, one would expect that women could adequately feed themselves and their children without male provisioning. Most tropical hunter-gatherer societies are immediate return ones.

Gardner (1972, p. 414), in describing the Paliyans, a foraging people of India, has pointed out that, "In normal times Paliyan men and women spend a bare three to four hours a day obtaining food and evidence no anxiety whatsoever about its supply." Single individuals are able to feed themselves easily, and married couples may not feed each other. Male provisioning is clearly not necessary. Not surprisingly, with the parties not needing each other economically, "the usual situation is one of fragile, often serial, unions, terminated quickly by the offended party when conflict arises" (p. 419).

A similar impression is left by descriptions of other tropical hunter-gatherer societies. Lee & DeVore's famous *Man the Hunter* is often summarized as showing that most calories come from gathering, not hunting, that most gathering is done by females, and that hunter-gatherers need spend only a relatively small part of their time in gathering. Taken together, these facts imply that a woman can feed her family with little male assistance. This suggests that males would leave more descendants by focusing their efforts on mating rather than on provisioning.*⁽²⁾

THE COLD CLIMATE SITUATION

Now consider a cold climate, such as prevailed where the northeastern Mongoloids (Chinese, Japanese, Koreans) are believed to have evolved. Even now these areas have cold winters. During the last ice age they were much colder. Their people's physical features evidence numerous cold adaptations (Coon, 1965, 1982; Krantz, 1980; Roberts, 1978).

Although winter is only part of the year, it is the season animals have the greatest difficulty surviving. Most plant foods disappear (fruits, berries, edible leaves). Hunting becomes more difficult. Most animals time their reproductive cycles so there are no winter young or eggs. Eggs and young were the easiest animal protein for primitive men and women to obtain, since they were immobile or moved too slowly to escape. Many adult animals migrate (birds) or hibernate to escape the winter food shortage. Frozen ground prevents humans from digging for tubers and ice prevents or complicates fishing. Snow cover makes it hard to find fallen nuts or tuber locations, and makes walking much more difficult (Jochim, 1976, p. 138). Winter has severe weather episodes in which it is unsafe to leave shelter to hunt. Also, winter cold increases the

body's food requirements (Kleiber, 1961, p. 164, p. 239). Finally, winter is a time of short days (Torrence, 1983, emphasizes this). Thus, the very period when food is needed most is also when it is scarcest, hardest to acquire, and the time for gathering it is least.

Admittedly, there could be geographical circumstances where winter is easier. Many ungulates (such as elk) in mountainous areas winter in the lowlands. Possibly this concentration, aided by ease of tracking in snow, could make winter an easier time for survival. However, males would still be expected to be the sex that took advantage of this situation.

Jochim (1976, pp. 141-143) has estimated food consumption for German mesolithic foragers by seasons. Plants (female gatherable) are estimated to be 30% for spring and summer, 23% for fall, but zero in winter.

In northern climates a female cannot be self supporting. A female would avoid marriage to a hunter already supporting another's family. Even if married to an excellent hunter, a second wife (receiving half of his support) would probably be poorly provisioned. Cold climates lead to environmental monogamy (Alexander, Hoogland, Howard, Noonan, and Sherman, 1979). Males evolve drives that encourage family provisioning, and discourage competing for mates.

Large game hunting often requires cooperation by groups of males. A male who doesn't have the cooperation of others is likely to bring home less meat, and to leave fewer descendants. Variability in hunting success makes it desirable to hunt in groups that share their kills. Withdrawal of cooperation by other males is a likely penalty for trying to impregnate another's wife. In such circumstances, the drives that lead to seeking multiple mates are selected against.

Of course, in a warm climate hunting groups are likely to exist and a philandering male may be penalized by exclusion from the group, or less cooperation. However, with opportunities for gathering and hunting small game abundant at all times, the penalty of loss of participation in the large hunts is less severe, and the selection against mating drives weaker.

Why presume that primitive hunters could not kill enough food to carry multiple females through the winter? After all, there is a lot of meat on even a single ungulate carcass. If game were abundant enough for a typical hunter to support more than one wife, population would grow. It would grow until the pressure on the game resource had reduced the yield from hunting to where one hunter could typically support only a single wife and offspring. The argument is the standard Malthusian one.

Although *Man The Hunter* is usually cited as showing that hunter-gatherers can feed themselves with a short work day, this appears true only of the tropical peoples discussed. That book also contains Balikci's (1968, p. 82) discussion of the Netsilik Eskimos, who had a 10% loss of life from starvation in two years. The inland Eskimos appear to be able to support only one family per male (Alexander et al., 1979). Other northern hunter-gatherers such as the Ainu appear to

have monogamy as the typical pattern, even if a few males have more than one wife.

Other descriptions of northern hunting peoples emphasize the difficulty of the life and the risks of starvation. For instance, Rogers (1972, p. 104) in his discussion of the Mistassini Cree, American sub-Arctic natives, states that, "Securing sufficient food is a constant problem and a never ending concern. Times of starvation are vividly remembered." He also states that the gathering of vegetable foods is minimal. In such an environment a typical male could not support more than a single female. Any inadequate provisioning of her offspring could reduce his reproductive success.

Likewise, Nelson (1973) discusses how those Kutchin (north Alaska) who remembered the old ways emphasized hardships and lack of food. He reports that similar attitudes to the past are found among other Athapaskan people. Emphasis is placed on far north people because Ice Age Europe and Asia had climates similar to these peoples' current homes (Soffer & Gamble, 1989; Scott, 1984).

Admittedly, a female without a "husband" would probably receive some meat from brothers, other family members, and other band members. In contemporary hunting bands game is usually shared with other band members (Hawkes, 1993). Even unmated females get some. Such a meat sharing system is very useful in spreading the risks of the hunt among families (Hames, 1990). In the short run, this clearly supplies some meat to women without husbands. However, it is likely that in the long run a female unattached to a male hunter would suffer. Adverse effects are most likely during occasional famines, when social traditions of sharing are likely to break down. Then band members are likely to give priority to their own offspring. One possible mechanism is through the more successful hunters joining bands with fewer non-related dependents, where their own families would be better provisioned. Thus, in time of famine, poor provisioning by a father would affect his children's survival. The sharing systems observed among current hunters probably evolved relatively late, after an earlier system in which males gave priority to themselves and their families. While sharing may moderate regional differences in the consequences for offspring survival of male provisioning, they are unlikely to eliminate them.

PREDICTIONS OF THE HYPOTHESIS

There appear to be several traits that contribute to success in mating competition. A strong sex drive would lead to more matings. A strong Coolidge effect (in which women other than regular sex partners were considered unusually attractive, see Symons, 1979, p. 209) would encourage taking additional wives, matings with other men's wives, and rape. Efforts to mate with other men's wives involves risks of retaliation. Thus, aggressiveness, impulsiveness, and lack of fear would contribute to leaving more descendants. If one were to have only an occasional mating with certain women, greater sperm production would lead to leaving more children. If males frequently succeeded in mating another's wife, a high sperm production and strong sex drive

would lead to leaving more offspring.

Empathy with others is not conducive to extra-marital relationships or even to taking additional wives. For instance, strong sympathy for one's children is likely to lead to devoting spare resources to them, rather than using the resources to purchase sexual access through prostitutes, concubines, or extra wives. Likewise, if extramarital intercourse violates social mores, a strong tendency to follow social mores is not conducive to extra-marital access. The above paternal investment theory makes a number of interesting predictions about the mating patterns of hunter-gatherer populations in warm versus cold climates.

USING RACIAL DATA TO TEST CLINAL THEORIES

Because agriculture was adopted relatively recently, differences that emerged during the hunter-gatherer stage should have survived into the ethnographic present. The above suggests that personality and behavior differences among modern populations should be correlated with the winter temperatures where they evolved. Tropical populations would be selected for greater mating efforts and lower paternal investment. In cold climates, the opposite would be true.

Ideally, analysis would use data expressed as behavioral clines drawn from data on many different populations. (A cline is a line connecting points of equal values for observations, such as lines on a weather map.) Unfortunately, such data is rare. Admittedly, some data is available from physical anthropologists' studies of specific populations, and from the ethnographic record, coded in the Ethnographic Atlas (Murdock, 1967).

However, some population level studies do exist using such data. Wolfe and Gray (1982) found a correlation between the extent of polygyny and the height of males and females. This is easily explained by the taller males having an advantage in acquiring mates, which leads to greater selection for height in polygynous societies. Wolfe and Gray were surprised not to find clear evidence of greater sexual dimorphism in such societies, which they expected from the animal evidence. However, in humans it is known that most genes that affect height appear to affect both males and females equally (excluding the obvious exception of those carried on the X or Y chromosomes). What they regarded as a puzzling correlation between polygyny and female height is easily explained. If taller males leave more offspring, the mean height of both males and females will be raised, leaving sexual dimorphism little changed.

Wolfe and Gray used a code for the extent of father-infant proximity in the first year of life as a measure of male parental investment. They found that this correlated to a statistically significant degree with measures of polygyny (Table 8.1), and with male and female heights. Since it is unlikely that height causes differences in marriage patterns, it is more plausible that sexual selection has affected the frequencies of genes for height, and possibly for a measure of paternal investment (if that is subject to genetic variability). For these effects to have appeared, the differences in marriage patterns must have persisted long enough for natural selection to have

acted. Although Wolfe and Gray did not notice this, this is the first clear evidence that sexual selection has played a role in the evolution of differences in gene frequencies among human populations.

Studies of the above type can be done for only a few variables. As Wolfe and Gray (1982, pp. 206-207) report, "Our search of the literature of cross-cultural codes revealed no codes that directly rate societies on the degree of male parental investment. This lack of codes is partly due to the fact that ethnographers rarely had a theoretical orientation in which the problem of male parental investment was of central concern and therefore rarely collected data on this problem."

However, various physical variables do correlate with climate, among which are skin color, shape of nose, body mass and shape, etc. These highly visible surface features include the variables usually used for racial classification. It appears that Negroids evolved in the warmest climate (tropical Africa), Mongoloids in the coldest (the North China-Siberia area), and Caucasoids in intermediate climates (Europe and the Middle East). These areas are separated from each other by barriers to gene flow. The Sahara partially isolates tropical Africa. During the ice ages, the Himalayan ice sheet separated the Caucasoids from the Mongoloids.

Limits on gene flow between different areas (although not complete) permitted populations in each region to develop somewhat different morphology and behaviors. Each evolved in their respective environments so as to produce the largest numbers of descendants. Each of the major races of mankind, Negroid, Caucasoid, and Mongoloid, is itself composed of numerous separate populations. In the absence of detailed information on personality in a large number of localities around the world, the best way to look for evidence of personality varying with climate is through examining racial variability.

Rushton and Ellis have assembled considerable racial information. (These differences of course are related only to central tendencies, and any one individual need not resemble his race with regard to any single trait.) Theirs are the best summaries of non-morphological racial differences. They deserve considerable credit for assembling this data. While they interpreted their findings in differential K selection terms, their data can also be used to test the male mating effort versus paternal investment hypothesis.

EXPLAINING RACIAL VARIATION BY MATING COMPETITION VERSUS PROVISIONING

Let us start by taking the list of personality characteristics Rushton assembled (1987, p. 1019; 1988, p. 1010; 1989a, p. 9; Rushton & Bogaert, 1989) and see whether a mating effort versus parental investment framework can explain them. This can be done for most items.

Aggression

Negroids are reported (by Rushton) to be the most aggressive and Mongoloids least aggressive (Caucasoids intermediate). From a reproductive viewpoint, aggression's benefits include leadership positions. These assist in obtaining multiple wives, and frequently provide opportunities for extramarital relationships. Aggression also produces children through rape. In warm climates, where extra wives can be self-supporting, there are clear reproductive benefits to additional wives. In cold climates, lower survival of children by the first wife will provide a partial or even complete offset.

The disadvantage to high levels of aggression is that it leads to injury or even death, either in the course of the conflict caused by the aggression, or through retaliation by victims or society. In all climates death eliminates, and disability reduces, the chances of fathering additional children. However, in cold climates, death and disability are more likely to lead to the death of existing children, while in warm climates the mother is more likely to be able to rear her children alone. This effect alone would make the optimal position on an aggression-fearfulness continuum climate dependent.

Aggression also leads to interband raiding and warfare. These increase sexual access to other bands' females. Direct access may be through rape or wife capture. Indirectly, killing or defeating competing males reduces mating competition. Wives are later obtained by courtship or exchange.

However, additional wives only contribute to reproductive success if there is enough food to rear the resulting offspring. Where women supply their own subsistence, warfare and wife capture can produce reproductive gains. This is likely to be true in tropical areas. In cold areas, where wives must be provisioned by hunting, additional children from captured wives would divert scarce resources from other children, limiting the net gain.

A defeat in interband conflict leads to deaths and injuries. In northern climates, where the gains from success are small, and the losses large, the relatively non-aggressive will leave more descendants. In tropical climates, where the benefits are larger, selection will be for higher aggression.

While Rushton interprets aggression as a *r* characteristic, this is implausible. Gould (1982, p. 367) argues, "Since member of *K*-selected species inhabit the same niche and compete for population-limiting resources, it should not be surprising that these animals regularly fight with each other for control of those resources. Among *r*-selected species, on the other hand, fighting would be a waste of their most precious commodity, time." In essence, if resources are abundant, organisms will not benefit from fighting. Destroying other individuals is only beneficial when it eliminates competitors, which is to say in *K* conditions. In contrast, aggression appears unambiguously useful for obtaining numerous matings, even if not for provisioning.

Dominance

Very similar comments can be made regarding dominance, where Negroids are reported to be the strongest seekers of dominance and Mongoloids least (Caucasoids intermediate). Dominance seeking leads to more mating opportunities, but also to death and injury, which reduces the survival of already born offspring, especially where male provisioning is essential. If the extra wives that dominance and prestige provide cannot be supported, the ability to attract them gives little reproductive benefit.

Anxiety

Mongoloids are reported to be the most anxious, and Negroids least (with Caucasoids in between). This is closely related to dominance seeking and aggression, in that high anxiety deters dominance seeking and aggression. The more prone an individual is to anxiety, the less likely he is to seek additional matings beyond his first wife. It is usually not in the wife's reproductive interest for him to either take additional wives, or to seek extramarital relationships. She can be expected to have evolved to threaten retaliation, and occasionally retaliate by leaving, attacking the offending male, or enlisting the aid of her relatives or society against him. Conducting an affair with another man's wife, or an unmarried chaste female, or rape, all involve risk taking. Thus, where the optimal male strategy is to devote less efforts to mating than to provisioning existing children, high anxiety is selected for .

There are additional reasons for selection for high anxiety in cold climates. One strategy for surviving the winter is food storage (see Miller, 1991). Food storage is practiced only (with exceptions) in societies whose growing seasons are less than about 200 days (Binford, 1980). Anxiety about food supply encourages storage, and discourages their too rapid consumption. Where storage makes a difference, high anxiety is selected for.

Coon's descriptions (1971, p. 26-39) of hunter-gatherer housing shows that simple domed houses and lean-tos are used by southern people, while igloos, plank houses, and pit houses are used further north. Pit houses, roofed holes, are common among northern hunters because they protect well against intense cold. Houses in snowy areas can collapse with a heavy snowfall, and cause loss of life, as well as leaving the inhabitants exposed to the cold. Collapse of a tropical conical hut, or lean to, is only an inconvenience. Anxiety would appear to encourage the construction of houses with adequate safety margins, and possibly an early start to such construction. Thus, anxiety would appear to promote reproductive success more in areas with snow than in tropical areas.

Anxiety about being caught in a freezing storm, or away from a warm campfire overnight is likely to promote survival in cold climates. Thus, stronger cold climates selection for anxiety is predicted. (Nelson [1969] mentions the caution and absence of thrill seeking in Eskimos).

Impulsivity

Frequently, short term pleasures can be obtained by acting, but acting requires risking adverse consequences. One who frequently takes advantage of short term opportunities displays impulsivity. Those with high anxiety levels are less likely to seek immediate pleasures. Thus, it is not surprising that the ordering on impulsivity, Negroids highest, Mongoloids lowest (Caucasoids in between), is opposite to the ordering on anxiety.

In particular, males frequently have the opportunity to father children through extramarital relationships or rape. High impulsivity individuals would be expected to more often act on these opportunities than would low impulsivity individuals. Thus, impulsivity would be selected for where a high mating effort contributed to fitness.

Delay of gratification

Closely related to impulsivity is the ability to delay gratification. Mischel (1958, 1961c, 1971, p. 127) found a racial difference in preference for delayed gratification. Trinidad Indians (i.e. India origin) children would wait longer for a reward than Negro children, although he interpreted this as reflecting the greater absence of fathers among the Negro children. As is common in Negroid populations (see below), many of the Negroes lacked a father in the home, while few Indians lacked a father in the home. Cultural factors probably also play a role, since Grenada Negroes were similar to Trinidad Indians (Mischel, 1961c). Delay of gratification was less in a Trinidad industrial school for juvenile delinquents than in an ordinary Trinidad school, supporting the theory that difficulty in deferring gratification (such as choosing the immediate gratification obtainable from stealing, risking a future punishment) contributes to criminal activity (Mischel, 1961a). Gratification delay in Trinidad Negroes was found to be positively related to Harris's Social Responsibility Scale, which conceptualized responsibility "as a composite of attitude elements reflecting behavior classifiable as reliable, accountable, loyal, or doing an effective job" (Mischel, 1961a, b). Interestingly, the Trinidad Negroes scored much lower than a similar aged (presumably predominantly white) US group, which Mischel (1961a, p. 6) notes is "fully consistent with anthropological observations".

It is not known how heritable the ability to defer gratification is, although most personality variables appear to have a significant degree of heritability. However, in one experiment, using Barbadian Negroes in the Cambridge area, the mother's delay of gratification (choice of large bottle of instant coffee in a week or a small bottle now) was found to be correlated with the child's violating or not violating a prohibition in a temptation situation (Mischel & Gilligan, 1964, p. 412). This suggests both behaviors are reflecting a heritable trait.

Difficulty in delaying gratification and impulsivity makes provisioning more difficult. Provisioning requires suppressing the desire to eat in order to bring food back to the family. In warm climates, not eating food when available would merely deny the male forager the nutrition required to compete with other males, since his children will normally be fed in any case.

Also, a food storage strategy for surviving the winter requires deferring gratification. The impulse to immediately eat available food must be resisted to store it, and later the impulse to eat the stores must be resisted in order to retain them for later use. Survival through the winter may require not only storing food, but also storing fuel, making clothing, and building shelters. These activities require resisting impulses to divert energy to activities with shorter term returns (gathering non-storable food, drinking, or even flirting). Thus, there are other reasons why seeking immediate gratification and impulsivity would be selected against in cold climates.

Banfield (1974) has proposed that seeking immediate gratification among the U. S. inner city poor (who tend to be Negroids) explains much of their poverty. While he carefully denies believing in genetic differences (like other writers of the time), it is plausible that this trait, like most personality traits, has a genetic component. Furthermore, tropical environments, such as that of Africa, are ones where hunter-gatherer populations are described by Woodburn (1980) as "immediate gratification" ones. He has described how for the Hadza of Tanzania, food is available in the bush at any time, and that as a result there is little need to plan ahead or to defer gratification. Thus, it is plausible that the immediate gratification behaviors that Banfield blames for so many inner city problems may be a continuation of tropical hunter-gatherer behavior.

Sociability

Sociability assists in learning of, and exploiting, mating opportunities. However, time spent socializing reduces the time available for gathering food and for other parental investments. Sociability often involves remaining near the camp where others are located, while provisioning requires leaving to forage. Thus, selection for provisioning will reduce sociability.

It should be noted that if sociability leads to talking it would be selected against in northern climates, where quiet is required for hunting.

Extraversion

Extraversion represents a combination of impulsivity and sociability (Eysenck & Eysenck, 1985). Thus, extraversion will be selected for where selection for seeking copulations occurs, and be selected against in other areas. Thus, it is not surprising that Negroids rank highest in extraversion, and Mongoloids rank lowest, with Caucasoids in between.

Behavioral restraint

Rushton (1988, p. 1013) combined many of these characteristics and described them in terms of behavioral restraint, with Mongoloids being highest in behavior restraint, and Negroids being lowest (Caucasoids intermediate). Behavioral restraint is not conducive to males seeking mating opportunities, but is conducive to making high paternal investment, which frequently requires resisting immediate gratification opportunities.

Criminal activity

Criminal activity is closely related to behavior restraint, for which the evidence is that Negroids are highest, Mongoloids lowest, and Caucasoids in between (for documentation see Wilson & Herrnstein, 1985; Ellis, 1988, p. 532; Jaynes & Williams, 1989, chap. 9; Rushton, 1990a). Paternal investment theory would explain high crime rates as resulting from high aggressivity and low empathy, altruism, and rule following behavior, traits that contributed to tropical reproductive success. A contributing factor is that the racial ordering for intelligence (Mongoloids first, Caucasoids next, and Negroids last [Jensen, 1987 on Negroids; see Rushton, in press, for other references]) is opposite to those for crime, and criminal behavior is known to be more common among the less intelligent. Intelligence differences have been offered as explaining the racial differences in crime (Gordon, 1987).

If those selected for mating effort have higher levels of aggression, lower behavioral restraint, and higher sex drives, it would be predicted that rape rates would be higher. They are known to be higher in Negroids than in Caucasoids (Brownmiller, 1975, pp. 213-216; Ellis, 1989, p. 94).

Child abuse is another form of crime. Abusing a child is the opposite of investing in it. If cold climate fathers were selected for paternal investment, their descendants should commit less child abuse. Caucasoids do have lower child abuse rates than Negroids (Ellis, 1987, p. 159), and Mongoloids the lowest (Ellis 1993, p. 171) .

Sexual restraint

The form of behavioral restraint most sensitive to natural selection is sexual restraint. With regard to a wide range of sex related variables, including marital instability, Rushton (1988) and Rushton & Bogaert (1987) show that Mongoloids are the most sexually restrained, and Negroids least, with Caucasoids intermediate. Sexual restraint is the ability to resist opportunities for copulation. Males that devote their energies to paternal investment have less energy left for seeking additional matings.

Two mechanisms could produce greater sexual restraint. The sex drives (including those for seeking variety in partners) could be weaker, or the inhibitions to sexual activity could be greater. That populations exhibiting greater sexual restraint are also more restrained in other ways suggests that part of the explanation is the greater inhibition (discussed above).

However, populations may also differ in the strength of sex drives. Selection for a stronger sex drive (and for a stronger desire for variety in partners) appears a more efficient mechanism for increasing mating effort than merely selection for less restraint. Generalized mechanisms, such as changing anxiety levels, might prove counterproductive in non-sexual spheres. For instance, less anxiety might encourage taking excessive hunting risks.

Simpson and Gangestad (1991) show that the strength of the desire for numerous sexual partners (what they call sociosexuality) varies independently of the strength of the desire for frequent sex. It is very plausible that both are genetically influenced. They (Gangestad & Simpson, 1990; Simpson & Gangestad, 1991) present evidence that sociosexuality varies with personality dimensions that have been shown to possess heritable components. Gangestad and Simpson (1990) argue that seeking separate partners, versus making a commitment to one partner represent different reproductive strategies, but fail to consider the possibility that the equilibrium percentage of individuals following the different strategies may vary with the environment (and hence with race).

A genetic influence on the drive for sexual variety is also suggested by the greater male desire for variety. This is probably caused by the effects of testosterone (or another sex related hormone) on some part of the brain. Genetically controlled variability in the number of receptors or the level of hormones could produce variability in the strength of the desire for sexual variety across populations.

Sexual behavior

Rushton and Bogaert (1987) document differences in sexual behavior. Besides a literature review, they reanalyzed the Kinsey data on sexual behavior in American whites and blacks. This showed greater sexual activity in blacks than in whites. For instance, the black frequency for coitus in their first marriage was 3.83 times per week for those aged 21-25 versus 3.11 for similar whites. The more frequent intercourse within marriage suggests differences in sex drive, rather than in a generalized restraint (which should not affect the frequency of marital relations). Measures of the extent and frequency of extra-marital sexual activity (p. 542) showed more activity outside of marriage among blacks than among whites, with all reported measures being statistically significant at the .001 level. Most black working class females believe that a wife should expect running around (Staples & Johnson, 1993, pp. 156-157). ". . .Black females have their first full sexual intercourse some years earlier than the typical White female." (Staples & Johnson, 1993, p. 77). Differences in either sex drive or in social restraint could explain these differences.

Since age at first intercourse (Martin, Eaves, & Eysenck, 1977), and age at first date, marriage, and first and second child appears to be genetically influenced (Mealey & Segal, 1993), it appears appropriate to consider hypotheses that population differences in sexual behavior are also genetically influenced.

Differences in sexual restraint and in the number of sexual partners predict racial differences in sexually transmitted diseases. Such differences exist in the distribution of AIDS (Rushton and Bogaert, 1989). They had earlier been reported for syphilis, where the negro rate (often approximated by the rate for non-whites) is a multiple of the white rate, both in civilians and in

the military (Aral & Holmes, 1984, p. 130; Berg, 1984, p. 93; Lewis, 1942, p. 158). The reported gonorrhea rate is 21 times as high in blacks as in whites, although part of this difference may reflect better reporting from the public clinics frequented by blacks (Aral & Holmes, 1990, p. 22). For the common herpes simplex virus -2, the antibodies at ages 60-74 are found in over 80% of black females versus slightly over 20% of the white females (Aral & Holmes, 1990, p. 27). Pelvic inflammatory disease (caused by the spread of gonorrhea and/or chlamydia to the upper reproductive structures of women) is currently a major cause of female infertility in parts of Africa.

The most plausible proximate explanation for racial differences in sex drives is the possibility discussed below of differences in testosterone levels at the relevant ages. Testosterone promotes male sexual activity (Kemper, 1990, pp. 38-46).

Size of sex organs

One consequence of higher levels of puberty causing hormones could be greater development of the sex organs. Rushton and Bogaert (1987) use the Kinsey data to document longer penises and greater circumference of penises in blacks than in whites. From other sources they find Mongoloids to have shorter penises than Caucasoids. One condom manufacturer provides for larger size condoms for Africa than for other areas, and the smallest size for Asia (Wong, 1991). Mongoloids have smaller testes than Caucasoids (Short, 1984; Diamond, 1986).

It would be desirable to have good quality measurements of Negroid testes size, because the theory that they have been selected for high mating effort would predict larger testes in order to win at sperm competition. High levels of polygyny, and accompanying sperm competition, would select for large testes and high sperm production, especially allowing for the tendency for the largest number of wives to occur late in life. Among the large apes, the species that have multimale mating systems (notably the chimpanzee) have larger testes (Short, 1981; Smith, 1984).

The available evidence, while not of the highest quality, does not confirm this prediction. Ajmani, Jain, & Saxena (1985) found the scrotum diameters in 320 Nigerian males to be greater than had been reported for Europeans, as predicted. An American study of adolescents (Daniel, Feinstein, Howard-Peebles & Baxley, 1982) reported "There was no significant differences in testicular volumes between black and white adolescent boys. Any possible simple correlation with race was not significant against the general variability of testicular volume." No actual report is provided of the racial averages, leaving the possibility that some difference was found. In any case, a difference in adolescents might reflect only an earlier start to maturation among the blacks. In addition, one early autopsy study actually found lower testes weights in Negroids than in Caucasoids (Freeman, 1934).

Rushton and his colleagues explain these sex organ differences with his differential K selection

hypothesis. Yet it is not obvious that larger penises (or clitorises or vaginas) lead to more offspring. Thus, they should not be interpreted as r characteristics. More plausibly, they are a mere by product of selection for high levels of sex hormones. The testosterone surge at puberty enlarges the penis, and it is plausible that higher hormonal levels would produce a larger organ. Testosterone increases the penis size of castrated rats whether applied externally or injected (Wigodsky & Greene, 1940). This makes it more plausible that racial differences in penis size reflect hormonal differences.

Body build

There are racial differences in body build. Negroes have a more masculine body build than Caucasians (Laska-Mierzejewska, 1982). The masculine body build implies strong accentuation of such masculine characteristics as a large chest, and muscular body. Negro soldiers (males) have been found in two studies to be more mesomorphic (and less endomorphic) than white soldiers, with the difference being more than one standard deviation (Damon, Bleibtreu, Elliot, & Giles, 1962, Table 2).*(3). Simply put, mesomorphy is the amount of visible muscularity. Such a body appears to have been selected for conflict with other males. Notice, this observation is evidence for paternal investment theory, since other theories do not predict that the Negroid males will be more masculine.

However, the Japanese are relatively mesomorphic, both in Hawaii (Heath, Hopkins, & Miller, 1961), and in Japan (Kraus, 1951). Thus, the extent of mesomorphy appears to be one case where Ruston's generalization that the Caucasoids fall between the Negroids and Mongoloids breaks down.

Hudson & Holbrook (1982) found lower mean fundamental vocal frequencies in Negro males and females than others had found for whites. As is well known (and found by them), males display a lower frequency (deeper voice) than do females, and puberty deepens the male voice. This deepening is generally attributed to testosterone. The deeper Negro voice may reflect the influence of higher testosterone levels at puberty or prenatally.

Muscle characteristics

An interesting set of statistically significant differences in muscle characteristics has been found between black and white sedentary males (Ama, Simonau, Boulay, Serresse, Theriault, and Bouchard, 1986). African blacks were found to have less type I muscle fibers, more type IIa and lower activities in enzymes catalyzing reactions in phosphagenic and lactase dehydrogenase metabolic pathways. These were interpreted as likely to be inherited, and suggesting that blacks would exhibit better performance in sports requiring a short duration of exertion. Malina (1988) reviewed the literature on childhood performance, and found that blacks excelled in the dash, the standing long jump, the vertical jump, and the ball throw for distance. All of these involve a short burst of exertion. Tests with a bicycle ergocycle have shown Caucasians to have higher

maximal O₂ uptake, a trait adapted for endurance activities. Also, Ama, Lagasse, Bouchard, and Simonau (1990) reported better white performance (compared to black West Africans) in the last 30 seconds of a 90 second knee extension exercise, a result consistent with blacks making greater use of anaerobic energy metabolism than whites. What would have selected for racial differences in such traits?

Hunting is implausible both because Caucasoids are likely to have hunted more than Negroids, and because hunting often requires prolonged exertion to follow large animals. A likely explanation is male fighting, since fights often involve short periods of vigorous exertion (after which the opponent is hopefully defeated). Thus, Negroids appear to be selected more for fighting. This would be consistent with their more muscular body build and higher aggression. It is what would be expected if Negroids had been selected to win mating competitions.

Blacks have denser and stronger bones than whites (Himes, 1988; Pollitzer and Anderson, 1989). The disadvantage to higher density bones is higher weight (more energy required for movement) and greater need for calcium. The advantage is fewer fractures, and thus, lower mortality. The bone differences can be explained if black males engaged in more intermale conflicts, and those with stronger bones were less often injured. No other hypothesis comes immediately to mind that can explain these density differences.

Worthy (1977, chapter 2; Worthy & Markle, 1970; see also Jones & Hochner, 1973) has shown systematic differences in the sport positions blacks and whites play. He argues that where the positions require reacting properly to the opponents' actions, blacks are more successful, while whites do better where the player initiates his own motions, as in baseball pitching, marksmanship, or in shooting a basketball free goal. He reports a Negroid relative advantage in the defensive position of an experimental game where they had to react to their opponents' initiatives.

Worthy also correlated eye color with positions played. Dark eyed whites are overrepresented in the same positions in which blacks are overrepresented. In Worthy's theory, eye color plays a direct role. However, eye color also varies with ethnic origin, with north Europeans having more blue eyes. This suggests an Old World cline such that ability to react to opponents' actions increases to the south.

What circumstances would have selected for these different abilities? Survival in fights with other males would appear to depend on quick reactions to opponents' moves. In contrast, a hunter usually stalks his prey and then chooses the time to attack. Worthy's observations could be explained if male reproductive success in colder regions varied with hunting ability, while in the tropics it varied more with fighting ability. The eye color differences could be explained if hunting was even more important in northern Europe than in southern Europe, or if southern Europeans had interbred more with farmers of Middle Eastern origin.

Possibly relevant evidence is provided by Coleman (1980). Successful prone rifle shooters (who choose the moment of shooting) are the most introverted, while successful rapid fire pistol shooters (who have very little time to fire five shots, and have to move the pistol from target to target), are very extroverted. Apparently personality correlates with what looks like Worthy's reactive versus non-reactive distinction. Thus, an alternative explanation for these racial differences would rely on selection for different personality traits. Since tropical climates seem to select for both quick reactions (as in fighting) and for extraversion, and cold climates for the opposite, both theories predict a similar north-south behavioral gradient.

There are other intriguing reports of correlations of eye color with behavior. Rosenberg & Kagan, (1987, 1988) and Rubin & Both (1989) report that Caucasian children that are behaviorally inhibited (a concept related to introversion) are disproportionately blue eyed. While Rosenberg & Kagan suggest several possible biological mechanisms for this effect, a very plausible explanation is that north European children (more likely to be blue eyed) are more behaviorally inhibited than South European children (who are more likely to have brown eyes). Both eye color and behavioral inhibition are believed to be genetically influenced. If the effect is really biological with both eye color and behavior having a common cause (a pleiotropic gene effect), it would be predicted that where one sibling was blue eyed and one brown eyed, that the blue eyed one was more likely to be behaviorally inhibited. If the genes for eye color and behavior were associated merely because the ancestors of different children came from different regions, there would be no sibling correlation. Unfortunately, such a study has not yet been done.

An argument against Negroids having evolved for fighting is that they show lower pain tolerance than other races (Worthy, 1977, pp. 123-124)

Life Span Variations

Negroids have shorter lives than Caucasoids, who have shorter lives than Mongoloids. For instance, U. S. whites have a life span estimated at 76.1 years versus 69.1 years for U. S. blacks (U. S. Department of Health and Human Services, 1993). If testosterone shortens life (Hamilton, 1948), as it appears to do (shown by the shorter life span of males than females, and of normal males compared to castrated males), differential testosterone levels could explain the life span ranking.

Part of the shorter Negroid life span reflects more violent and accidental deaths, which could result directly from higher aggression. However, disease causes most of the excess deaths. As a general rule, more polygamous species have higher male death rates (relative to female rates), with much of the difference being due to degenerative diseases (Daly and Wilson, 1988, p. 142). As discussed below, Negroids appear to be more polygamous than other races.

An evolutionary biology theory of aging (Rose, 1991) holds that many genes are pleiotropic (i.e.

have more than one effect). The same genes that contribute to longer life often impose disadvantages earlier in life. In the simplest case, genes which delay degeneration (perhaps through directing more energy to cell repair) also imply early life disadvantages (perhaps through leaving less energy available for mating or for lactation). A longer life can be purchased only at the expense of an earlier reproductive disadvantage. Which genes are selected for depends on whether reproductive success is facilitated more by a long life, or by early life success. This may depend on whether selection is for high paternal investment or high mating effort.

Copulation precedes childbirth, while paternal investment follows childbirth. Since death destroys a man's ability to help his children, longevity facilitates paternal investing. Thus, if a father's death hurts his child's survival chances, selection for a long life will be stronger than if children can be raised without paternal assistance. Conversely, if an early death from mating competition is going to eliminate any reproductive benefits from slower degeneration later, the alleles that protect against degeneration in old age will be less beneficial (Diamond, 1992, Chapter 7, especially p. 132).

If a male does not obtain a mate when young, living longer will not add to his descendants. Suppose the number of matings determines how many descendants a man leaves. Then men are more likely to be selected for early vigor and competitive ability, even at the expense of an earlier death. Where males have been selected for mating competition, polygyny often emerges (see below). For many men to have multiple wives, others must have no wives. Thus, to perpetuate his genes in a polygynous society, a man must be ranked relatively highly by those who control sexual access. Dominance and prestige seeking would be selected for.

In a monogamous or nearly monogamous society, even undesirable men marry. Suppose genes that handicap men in mating also contribute to a longer life, and hence to greater offspring survival. Then carriers of these may leave more descendants than worse providers who are better at mating, but who still get only one wife. Genes for high testosterone probably shorten life but may contribute to mating success through stronger muscles, higher sex drive, and aggression. Many athletes shorten their lives by taking steroids (essentially synthetic testosterone) to promote competitive success.

Thus, strong male sexual competition leads to a shorter life span. This can be explained by paternal investment theory. In differential K theory, earlier deaths (in advanced countries, Negroids die earlier than Caucasoids, and Caucasoids earlier than Mongoloids) are interpreted as a result of going through the life cycle quicker. A long life span is thus a K characteristic.

Hormonal Levels Versus Timing of Sexual Maturity

Races differ in average age at sexual maturity (Rushton and Bogaert, 1987, p. 537). Negroids mature earlier than Caucasoids, and Caucasoids earlier than Mongoloids. Rushton interprets this

as showing less K selection in Negroids.

Insert Figure 1 About Here

An alternative interpretation is that higher adult levels of sexual hormones contribute to mating success. To have high adult hormone levels, the levels must either start to rise earlier or the hormone levels must rise more rapidly (or the rise must end later). Thus, it is likely that in populations selected for high mating efforts, the young males at any given ages will have more sex hormones. The process is illustrated in Figure 1.

If various behavioral and physical characteristics appear only when the hormone levels reach a certain value, the stages will occur earlier in populations selected for intermale competition. For instance, this could explain the report (Westney, Jenkins, Butts, and Williams, 1984) that at 11 years, 60% of black males had reached the stage of accelerated penis growth, while in a white sample this stage was reached at an average of 12 1/2 years. This genital stage significantly predicted onset of sexual interest. The correlation between physical development and behavior is most plausibly interpreted as being due to there being a common genetic cause for both the penis development and the behavioral maturation (probably testosterone related). Udry, Billy, Morris, Groff, and Raj (1986) have shown that free testosterone predicts the onset of sexual motivation and behavior.

Lynn (1990) has argued that differences in testosterone could explain many of the observed racial differences, including the racial ordering in prostate cancer rates (Negroids highest, Caucasoids intermediate, Mongoloids lowest). Testosterone was 19% higher in black college students than in white students (Ross, Bernstein, Judd, Hanisch, Pike, & Henderson, 1986). Ellis and Nyborg (1992) have documented higher male testosterone levels in black veterans than in white veterans, although the magnitude of the difference appears too small to explain much of the behavioral difference. Prenatal or puberty differences have yet to be examined. Prenatal and pubertal testosterone play a major role in the emergence of masculine behavior (Gandleman, 1992, chapter 3). Olweus (1986) has shown in Swedish boys aged 15-17 that testosterone levels predict physical and verbal aggression. Testosterone levels have substantial heritability (Meikle, Bishop, Stringham, & West, 1987). High Negroid prenatal and postnatal testosterone could explain their more muscular body build, their deeper voices, their greater aggression, their greater dominance drive, their strong sex drive, and their shorter lives. Unfortunately, high testosterone correlates negatively with male occupational success (Dabbs, 1992) .

Thus, sex hormone differences could explain many racial differences. A strong point of differential K theory is its apparent parsimony. A large number of seemingly unrelated differences can be explained by a single evolutionary theory. If many of the differences trace to a single direct cause, sex hormone levels, or other ultimate causes that act through the sex hormones, then other theories are equally parsimonious.

Possibly, some other variable, such as monoamine oxidase levels, that affects multiple racially variable aspects of personality (Zuckerman, 1983, pp. 55-57), could explain many of the observed differences. Ellis (1991, p. 238) cites three studies showing that blacks have significantly lower monoamine oxidase levels than whites. Monoamine oxidase appears to be related to criminality, impulsiveness (Wilson, 1993), and sensation seeking (although the latter appears to be lower in Blacks [Ellis, 1991, p. 238]). Recently, further evidence of a link with aggression has been found through finding a family with a genetic defect in monoamine oxidase formation which lead to high levels of aggression in male carriers (Brunner et al., 1993).

IMPLICATIONS FOR FEMALES

Paternal investment theory deals with natural selection among males. The effects of such selection probably altered female traits also. Most human genes relevant to behavior have similar effects in both sexes (for instance, Eaves et al., 1989, p. 99). If the genes contribute greatly to male reproductive success and have relatively little effect on female reproductive success (as appears likely for many of the genes discussed above) male and female genotypes will both reflect selection for male reproductive success. Recall the earlier discussion of the effect of polygyny on height. This mechanism is consistent with Rohner's (1976) cross-cultural survey finding, that "the level of aggressive behavior displayed by children of one sex varies directly with the level of aggression among children of the other ($r=.88$, $p<.01$)." Similar results were found for adults.

However, behavior relevant genes can affect only one sex, especially if acting through testosterone, or other sex hormones. For instance, a gene acting only on the testes would affect only males. Races differ in some traits, such as in impulsivity and risk taking, that are affected by different genes in males and females (Eaves et al., 1989, p. 269).

Draper & Harpending (1988, p. 350) note that, "These father-absent females recognize that male parental effort is not crucial to reproduction and they are less coy and reticent, engage in sexual activities earlier and with less discrimination, and form less stable pair bonds."

All other things equal, females who start reproducing early leave more descendants. If the mother (or her female relatives) can rear the children, early opportunities for pregnancy should be accepted, especially if the genes are from a dominant and aggressive male. However, in cold climates other things are not equal, and waiting for a male who will provision her promotes female reproductive success. A female who has a child by a non-loyal male reduces her chance of catching a provisioning mate. If she does get one, he may be unwilling to support another man's child. Such male behavior reduces or eliminates the reproductive utility of having taken the first opportunity to be impregnated.

Females benefit reproductively from obtaining genes for success at polygyny or extra-marital matings. Females might benefit reproductively from mating a male who had exhibited his

mating success, even if this implied less provisioning. Thus the model would predict tropical females would mate earlier than northern females, and would be more accepting of mates who were aggressive, dominant, self confident, non-empathetic, etc. Even if these traits appeared unlikely to lead to marital happiness, males exhibiting them probably had genes conducive to mating success. Northern females would prefer males who exhibited provisioning behavior, and traits conducive to it, such as altruism and empathy. Thus, cold climate females would be selected for the behavioral restraint or weak sex drive needed to resist taking the first mating opportunity, and for the intelligence to detect the courting male who will likely provision her. The earlier marriages and higher illegitimacy rates among Negroids are consistent with being less selective in accepting mating opportunities. The higher child abuse in Negroids (often by husbands or boyfriends) is consistent with less selectivity in mate choice, and possibly with more often choosing aggressive males for mating.

The prediction that Negroid females would select mates more for good genes than for a promise of provisioning is supported by Staples & Johnson's (1993, pp. 111-112) observation that, "Black women demonstrate a stronger preference for a physically attractive man than her White counterparts," although they complain that "When personal characteristics that are genetically influenced make such an important difference in a person's status, a genetic determinism emerges that is very similar to the operation of racial attitudes."

If securing male paternal investment is critical to female reproductive success, females should devote more effort to securing and keeping a provisioning husband than if such a husband is not critical. Notice that a low level of male mating effort is expected to correlate with a high level of female mating investment in this mode. In contrast, in a simple r versus K model, if one sex is high on mating effort the other sex would be expected to be also. Women evolved to attract and retain husbands would be expected to derive satisfaction from fulfilling the role of wife. Among whites (apparently college educated), 74% of women would choose the role of wife over that of mother, while only 50% of black college women, 24% of "middle" status black women (described as upper-lower class), and 16% of low status black women made that choice (Bell 1971, p. 254).

Males pursuing a high mating effort strategy (low provisioning) would probably be less satisfactory as mates. Thus, it not surprising that 100% of married white women stated they would marry again if they could live their life over, while only 88% of black college educated women, 64% of the "middle status" blacks, and 36% of the low status blacks made that choice (Bell, 1971, p. 254). In considering these answers, it must be remembered that college educated women were a much lower percentage of the black population, so their answers were probably less typical of all blacks than the college educated were of all whites.

A similar lack of desire to live with ones lover is reported from Jamaica. Among Jamaican black females many actually prefer a "visiting" relationship with their man (i.e. one where the partners live separately, but have sexual relations leading to children) to a common law marriage where

the man live with them (Roberts & Sinclair, 1978). Of course, this may say more about the relevant men, than about the women.

Where males are more aggressive, one would expect females to need to be more aggressive in order to deal with their mates successfully. Where devoting energy to provisioning is not in the male's reproductive interests, females who aggressively assert their rights might be more successful than those who are more passive.

Where the males devoted much of their efforts to mating, leaving the females to provision themselves and their children, females would be strongly selected for traits conducive to successful gathering, such as initiative and a willingness to work hard. Males would be less strongly selected for willingness to do hard continuous work (although they might be selected for the quick burst of energy needed for fighting). Males might even benefit reproductively from laziness, if that led them to remain in camp where they could mate extra-maritally. Thus, the prediction is that tropical women would appear harder working than tropical males.

While direct evidence on this prediction is lacking, many have noted the greater occupational and educational success of U. S. black females relative to black males (see Taylor, 1992, p. 25). Black females earn 99.0% of white female annual earnings, versus 64.6% of white male earnings by black males (Jaynes & Williams, 1989, Table 6-5). The personality traits that were required to feed an African family, both in gathering and in agricultural times (notably consistent, continuous effort), are more consistent with occupational and educational success in an industrial society than those required for achieving multiple matings for males (aggression, for instance). African females without these traits probably left fewer descendants. A low level of male provisioning appears to have existed in sub-Saharan Africa both pre and post agriculture. Even in contemporary Africa, the women appear much more industrious than the men (Lamb, 1987, p. 38).

Why the Emphasis on Hunter-Gatherers? So far this study has focused on the selection for mating versus provisioning during the long hunter-gatherer period. This hunter-gatherer emphasis is traditional in sociobiology, since *Homo sapiens* have been hunter-gatherers for 99 percent of their time here on earth. Disagreement continues among experts as to just when modern humans emerged (Gee, 1992; Harpending, in press) and how long current races have existed. Mountain, Lin, Bowcock, & Cavalli-Sforza (1992) have shown the classifications that result from using several different methods. Their descent trees and those of others (Zhao and Lee, 1989; Nei & Roychoudhury 1993) agree that the largest genetic difference is between Africans and all other populations.

Recent interpretations of mitochondrial DNA mismatch distributions are consistent with the existence of racial differences. Harpending, Sherry, Rogers, and Stoneking, (1993, p. 494) report that "Given these caveats, our results show that human populations are derived from separate ancestral populations that were relatively isolated from each other before 50,000 years ago," and

(p. 495), "The existence of between-group differences far older than within-group differences implies that the late Pleistocene expansion of our species occurred separately in populations that had been isolated from each other for several tens of thousands of years."

An alternative to the "out of Africa" hypothesis for human origins is the multi-regional hypothesis. Recently, two well preserved *Homo erectus* fossils in China were found that displayed many characteristics similar to those of current Mongoloid populations (Tianyuan & Etlar, 1992). This discovery that possibly the early races were the ancestors of the current races. Under either hypothesis, there would have been time for racial differences in behavior to have evolved.

It is clear from the differences in skin color and other traits that human populations have been separate for long enough for major differences to have emerged. These adaptations to climate are believed to have emerged through small differences in survival rates among carriers of different genes. For instance long noses are believed to warm and humidify the air entering the lungs in dry or cold climates (Krantz, 1980, pp. 101-118), presumably reducing the death rate from respiratory diseases. Long periods are required for such small differences in survival to produce observable differences between populations.

In contrast, differences in mating success have the potential for comparatively rapid changes in gene frequencies. Just consider the difference in number of descendants between a male who has children with two wives, and one who has only a single one in areas where survival does not require male provisioning. Any personality traits that handicap a male in obtaining the second wife in such areas would be strongly selected against. For instance, Chagnon (1988) has reported that the Yanomamo males unokais (one who has killed another, usually in a raid) enjoyed higher marital success (1.63 wives per male versus .63 for non-unokais) and had more offspring (4.91 versus 1.59). If certain personality traits (aggressiveness, courage, sensation seeking) contribute to achieving unokais status, selection for these traits could be very rapid, much more rapid than selection that depends on merely slightly lower death rates for carriers of certain genes. In particular, population differences in personality relevant to marital success should emerge quicker than differences in noses. The observed differences in noses between populations imply that there has been time for mental differences to have emerged.

Recently, a behaviorally relevant allele was shown to vary with race, being more common in blacks than whites (Blum, et al. 1991) The relevant gene (the D2 dopamine receptor gene) is associated with severe alcoholism. It is easy to imagine that alcoholics would be avoided as mates, and that once alcohol was abundant in a society that the genes contributing to it would be rapidly selected against.

Thus, from the observation that populations differ in skin color and related traits whose frequency is determined by differential survival, we can deduce that northern and southern populations have been separated long enough for differences in personality variables that affect

mating versus provisioning to have emerged.

THE DISTRIBUTION OF POLYGYNY

Once a population had evolved drives for low paternal investment and high mating effort, these genes would survive the adoption of agriculture. Men would devote their efforts to acquiring additional wives, and to mating with other available females. This would be especially likely if technology was such that a female could raise enough food to provision herself and her family, as is frequently the case in tropical horticulture. Thus, the paternal investment versus mating theory predicts that polygyny would be more common among tropical origin populations.

The model predicts the pattern of current polygyny. In White's (1988, p. 553) map of what he calls male stratified polygyny with autonomous cowives ("autonomous cowives" means that the wives basically support themselves) Africa is conspicuous. Interestingly, several New World examples are among Negroid or mixed populations (Saramacca, Goajiro). Pebley and Mbugua (1989, p. 338) report that "throughout most of southern West Africa and western Central Africa, as many as 20 to 50% of married men have more than one wife," and that "The frequency is somewhat lower in East and South Africa, although 15 to 30% of husbands are reported to be polygynists in Kenya and Tanzania," confirming Welch & Glick's (1981) summary of official statistics. In contrast, in Arab Muslim countries only 5 to 12% of men have more than one wife. While polygyny occurred in Europe and Asia, the rates do not appear to have been as high. Much of their polygyny was in ruling class harems.

The average polygyny rate in each of several "culture areas" was calculated from a tabulation provided by Hartung (1982), whose measure correlates with other measures of polygyny (Low, 1987). The highest was 39% for sub-Saharan Africa. The second highest was 21% for the Island area (including Australia, Indonesia, Polynesia, and Madagascar) which is populated by people that appear to have evolved in warm areas of Southeast Asia. The rates for societies containing Caucasoid (circum-Mediterranean, 15%) and Mongoloid (Eastern Eurasian, 10%) peoples are much lower, with the rates for North (11%) and South American (11%) natives resembling those of other Mongoloid peoples. These rates seem low, even where polygyny is culturally acceptable.

It was argued that during the hunter-gatherer period stronger mating drives emerged in warm areas where winter gathering was possible, and these survived the coming of agriculture. To test this theory, a regression of polygyny on latitude was computed giving (standard errors in parenthesis):

Percentage Polygyny = $32.1 - 0.481 \text{ latitude}$

$R^2 = 0.098$ (2.5) (0.098)

A highly significant effect exists for the Old World considered alone:

Percentage Polygyny = $35.0 - 0.56 \text{ latitude}$

$R^2 = 0.11$ (2.8) (.13)

However, the New World lacks a statistically significant correlation of polygyny with latitude. This lack is striking, and inconsistent with the Old World correlation being caused by the environment somehow affecting culture. Africa's high polygyny rate has been associated with its lack of animal drawn plows (possibly due to tsetse fly infection eliminating draft animals or due to failure to invent or to adopt the device) (see Burton & Reitz, 1981; Goody, 1976; White & Burton, 1988). Animal drawn plows are argued to require male operation, and a male cannot plow enough land to support several families. However, the low New World polygyny (prior to the European arrival), where the lack of suitable draft animals also prevented plow agriculture, presents a problem for this theory. The New World uniformity across latitudes can be explained by inadequate time for climate to have affected gene frequencies related to polygyny. This explains why New World polygyny rates resemble those of other Mongoloids.

Admittedly, African conditions were such that a woman engaged in horticulture could continue to support herself and her offspring. There was a low population density (possibly due to disease) which made shifting cultivation possible. Such slash and burn horticulture has a high per unit labor output (Boserup, 1970). This is because newly cleared land is relatively fertile. In such conditions females can grow enough food for themselves and their children, making it possible for the males to continue their old high mating effort strategy. Males who diverted effort from mating to tending crops would have increased their offspring's survival too little to offset the reduction in the number of children fathered. There are other theories.

Low (1988, 1990) argues that pathogen stress leads to polygyny, through increasing the female incentive to seek genetically superior males. Her data does show a statistically significant relationship between polygyny and pathogen exposure, although the relationship may reflect only the above noted tendency for polygyny to be more common in tropical areas, and the higher disease rates within these areas. Besides Low's mechanism, high pathogen levels could lead to polygyny through lowering the population density to where land productivity was high enough so that females did not require male provisioning. The story then becomes very similar to the argument of this paper.

Hrdy (1992, p. 434) has concluded that in horticultural Africa that "Matrilineal social organization combined with female-centered horticultural practices mean that by and large male investment is not critical for child survival and well-being. . ." These are presumably the conditions in which the optimal male strategy is to emphasis mating rather than paternal investment.

The theory here is that polygyny is at least partially a response to an evolved male desire for sexual variety. This theory has appeared before, only to be quickly dismissed. G. Lee (1979, p. 702) claimed there was no biological evidence in favor of the view that males had a predisposition for variety in sexual partners, and that "there is no reason to expect the properties of the male sex drive to differ across cultures." Male/female differences in the nature of sex drives are now a staple in sociobiology (Symons, 1979), while this paper provides a plausible reason for the properties of the male sex drive to vary across cultures. It should be noted that in a society where polygyny is both accepted and practical (i.e. a typical man can support more than one wife and her offspring), males who lack the drives which lead to polygyny will leave fewer descendants, and such drives will be selected for, or more strongly selected for, than in other societies. Where polygyny is either forbidden, or not usually practical (i.e. multiple wives can not be successfully provisioned), the drives may be selected against, especially if they reduce the provisioning of offspring, or lead to conflicts with other males. Thus, conditions that lead to polygyny are likely to select for male characteristics that will lead to its continuation. However, in the proposed theory, the drives had been earlier selected for in the hunter-gatherer stage, and favorable conditions in many tropical lands (low enough population densities so that women could grow enough food to support themselves and their offspring) merely permitted polygyny to become widespread, and continued the selection for drives leading to mating success.

Thus, African polygyny is probably not recent, but has existed since the early days of African agriculture. Notice how evolutionary reasoning can provide evidence about the period before a written history.

Once males had multiple wives, they rationalized their behavior. Many will protest that culture is independent of biological drives, and that it has entirely separate origins. Here mores are argued to be affected by actions, as well as to affect actions. If someone doubts man's power to rationalize what his drives lead him to do, he might consider homosexuality. There is a remarkable correspondence between acceptance of homosexual acts and homosexuality (defined as a type of sexual orientation). Relatively few homosexuals (i.e., those with strong attractions to those of the same sex) strongly condemn homosexual acts. Current scientific evidence is that homosexuality has biological correlates (Allen & Gorski, 1992; Bailey & Pillard, 1991; Bailey, Pillard, Neale, & Agyei, 1993; LeVay, 1991), and probably a biological basis. If biology does not influence mores (a cultural variable), why the strong correlation between homosexual drives and having mores permitting acting on such drives?

As a thought experiment, it may be useful to imagine the sexual culture and mores that would emerge on an island occupied only by homosexuals (perhaps as a result of exile). As an even stronger thought experiment imagine an island inhabited by Lesbians who were supplied with sperm from males conducive to offspring being Lesbian. Very likely, in a few generations the culture's sexual mores would be quite different from those of a heterosexual population.

As another thought experiment, imagine a good family man who becomes involved with an

attractive female worker at a Christmas party. Surely, he would be less condemning of extramarital affairs afterwards.

Work with bisected brain patients and other sources suggests the left hemisphere of the brain has an "interpreter" which provides interpretation for actions undertaken for reasons it is not conscious of (Gazzaniga 1992, pp. 121-137). While culture clearly influences behavior, behavior and the drives leading to it may also influence culture.

It should be noted that the African polygyny with autonomous cowives would select for a high level of mating effort relative to provisioning effort, and continue a pattern that had probably emerged earlier in hunter-gatherer times. If the argument regarding hunter-gatherer conditions is rejected, African patterns of horticulture with the potential for wives to be self supporting may have existed long enough to select for some of the same traits (especially allowing for the difference in reproductive success among males who differ in their ability to acquire self-supporting wives).

Where males are following a high mating effort strategy, fathers will frequently leave their mates while the children are young and still dependent on their mothers. In such circumstances, the link with the mother will appear more important than those with the father. It then becomes logical to trace descent through the mother rather than the father. This is a plausible explanation for the observations that matrilineal systems are most frequent in simple horticultural systems (Aberle, 1962, Table 17-4), where females supply most of the agricultural labor (i.e. male provisioning is not necessary). Indeed, Schneider (1962, p. 16) asserts that, "The institutionalization of very strong, lasting, or intense solidarities between husband and wife is not compatible with the maintenance of matrilineal descent groups." and that (p. 22) "In matrilineal descent groups the emotional interest of the father in his own children constitutes a source of strain . . ."

To argue that cultural differences led to appreciable differences in gene frequencies one must argue that the relevant cultural differences have persisted for a very long period, given the slow speed at which natural selection operates. One should provide a plausible explanation for the persistence of the cultural differences. Cultural differences due to random drift probably do not last long enough to produce appreciable differences in gene frequencies. However, cultural differences due to environmental features can persist long enough for natural selection to change gene frequencies. Suppose African polygyny can indeed to be traced to a low population density (perhaps disease caused) which makes fertile land abundant enough so that wives can support themselves and their children. Then such a pattern could persist for long enough to shift gene frequencies in directions conducive to mating success.

Of course differences between populations in the frequency of behavior relevant genes could arise without being related to differences in appearance, or "race." One plausible place to look for differences would be between populations dependent on herding and those dependent on

agriculture. Several observers have noted higher levels of aggression in herding populations. Edgerton (1971) discovered that herding populations are more aggressive than agricultural populations in four East African cultures. Livestock is easily stolen since it can merely be driven away, while crops usually must be harvested and then carried away. Already harvested crops are likely to be in defended storehouses. Thus, in herding areas a pattern of raiding for livestock emerges. Herders appear to be very fierce and willing to fight. Herding is a subsistence method that emerges in certain geographical areas (notably those too dry for agriculture and not easily irrigated). Herding may have been used by certain populations for a very long period, and populations may have been selected for the personalities suitable for raiding or for defending against raids. Higher levels of lactose tolerance in certain milk drinking herders (Bedouins for instance) suggest that they have been dependent on milk from their herds for long enough for gene frequencies to have been altered (Durham, 1991)

Of course, once gene frequencies conducive to devoting efforts to mating at the expense of provisioning had emerged for any reason, a transfer of the populations to other environments would result in a continuation of high mating effort and low provisioning. The forced transference of Africans to the New World provides an opportunity to test this prediction in a manner analogous to the adoption study in behavior genetics.

New World African Origin Populations

Interestingly, a pattern of weak husband-wife attachments with a succession of liaisons exists in New World populations of African descent, such as in the Caribbean, with its high percentage of female headed households (see Otterbein, 1965, Table 1, column 4 for the percentage in many societies, and Weinstein [1962, chap. 3] for a description of mating in the U. S. Virgin Islands). Smith (1962, p. 263), after describing several Caribbean systems with frequent changes of mate, notes that European societies have maintained monogamous systems since Tacitus, while West Indians rejected it. While he does not mention genetics, he does describe the extremely brittle marriage systems of the polygynous Hausa of Nigeria, in which the typical woman marries three or four times between menarche and menopause (p. 257). He describes how formal polygyny is not accepted on Carriacou Island (presumably because of church and government opposition), but describes a system where men frequently mate simultaneously with two women, each living separately (p. 29-30).

Roberts & Sinclair (1978) document the Jamaican system, which they report closely resembles the system among Trinidad Negroes (but not Trinidad Indians), with widespread "visiting" unions which produce children without the parents living together. They point out that the Jamaican marriage pattern appears to have been stable since the last century in spite of many political, economic, and social changes, an observation that appears inconsistent with it being a cultural holdover from African days, and with it being a result of slavery. Both cultural models would have predicted some response to the government and church pressures to adopt a more European mating system.

These Caribbean family systems appear to be low paternal investment ones not only because the fathers frequently do not live with the families, and there are multiple partners during their lifetime, but also because the fathers appear to make relatively small financial contributions to the support of their mates and children, even when they live together (Roberts & Sinclair, 1978, p. 64 and their case studies)

The New World Negroid pattern has frequently been explained as a continuation of African culture. "Retention of African polygamous practices was observed by nineteenth-century abolitionists working in the Sea Islands off the coast of South Carolina" (Staples & Johnson, 1993, p. 142). Sudarkasa (1988, p. 31), after noting that "African conjugal families normally involved polygynous marriages at some stage in their development," suggests that polygyny is reemerging in the American black community. Herskovits, who emphasizes the continuity of African traditions, comments that (1947, p. 299), "the father, as in Africa, remains on the periphery of the nucleus constituting the household, whose center is the mother, a grandmother, an aunt." Alternatively, the matrifocal ex-African family can be viewed as a social adaptation (possibly with a genetic component) to a male genetic strategy of low paternal investment, and high mating effort. Among American blacks, very high illegitimacy rates (66.7% of black women who bore a child in the last year were unmarried, versus 16.9% of whites, and 6.9% of Asians and Pacific Islanders [Bachu, 1993, table B]) show the continuation of a pattern of weak paternal investment. Although the percentage of black children living in families headed by women has been increasing (as has the white rate), it appears to have been consistently higher than the white percentage (Morgan, McDaniel, Miller, & Preston, 1993). Of course, the two parent black family has been common in the US, and Gutman (1976) has shown that in slavery and afterwards it was the most common pattern, although he does not claim that the black pattern was the same as the white pattern. Recent historical research using a sample of Census returns shows that many never married black women with children apparently reported themselves as widows in the Census of 1910 (and presumably in other censuses), making the true rates of illegitimacy appear lower than they really were (Preston, Lim, & Morgan, 1992).

Bulcroft & Bulcroft (1993) found a relatively minor difference between white males and white females in the desire to marry, but a much larger differences between black males and black females. For instance, the percentage of white males not desiring marriage aged 19-25 was 12.6% versus 11.2% for white females. Black females were similar at 12.7%, but 22.8% of black males did not desire marriage. The authors present evidence that the most important explanation for the black male's lower interest in marriage is a belief that it will not have a positive effect on their sex lives. While the authors interpret this as being a result of the favorable sex ratio black males enjoy, the pattern of results could be explained by the hypothesis of this paper. It reflects the blacks male's low paternal investment strategy, with a strong desire for sexual variety (inconsistent with American monogamous marriages) being one of the mechanisms that evolved to direct his primary efforts to mating.

Ethnographic accounts of life among American lower class blacks also report that black females

desire traditional marriages, while black males are reluctant (E. Anderson, 1989). Notice that ethnic culture cannot explain differences between black males and females since both share the same ethnicity, while the observed difference is well explained by the black males having been selected in Africa to use a low paternal investment strategy. The reproductive interests of black females both in Africa and in the US is served by being mated to a male who will make high paternal investments.

These patterns of weak pair-bonding, and low levels of male provisioning, are sometimes explained as a residue of plantation slavery. Testing this theory requires finding a New World African origin population that lacks a history of plantation slavery. Such a population exists. It is the Black Carib (coastal Belize, Guatemala, and Honduras), who are the descendants of survivors of slave ships wrecked before reaching the plantations, and who intermarried with the Carib natives (and later with other blacks). Still there emerged a pattern of multiple marriage partners during life, with some having simultaneous wives (Gonzalez, 1969, p. 72). This mating pattern appears quite similar to the pattern among other New World African origin populations.

The evidence provided by ex-Africans in the New World is important because, like the adoption study in behavior genetics, it alters the environment while leaving the genes unchanged (although often mixed). Since culture seems to change rapidly among immigrants to a new land, it is hard to imagine much of the original African culture having survived the voyage to the New World, and the many generations of influence by Christianity and other aspects of Western cultures.

Father Absent Societies

Differences in selection for provisioning versus mating may explain other cultural regularities, such as the association between father-absence and aggression or crime (Whiting, 1965; Bacon, Child, & Barry, 1963). Draper & Harpending (1987, p. 349) have stated "father present societies are those where most males act like dads and father absent societies are those where most males act like cads," and have described other characteristics of the two types of societies. For instance, father absent societies are associated with local raiding and warfare, hostile relations between men and women, higher level of male violence, male public bombast oratory and rhetoric, transient bonding between males and females, less male direct provisioning, and women devaluing the male paternal role.

Draper and Harpending recognize the relevance of paternal investment theory (their theory involves early childhood experiences), but do not predict which societies will be father-absent ones (but see Belsky, Steinberg, & Draper, 1991, for an update). The alternative proposed here is that father-absence exists in descendants of tropical hunter-gatherers (which include most so-called middle-range societies practicing non-intensive agriculture), while the father-present pattern exists in descendants of northern hunter-gatherers (including the wet rice and other plow-using grain growers).

Whiting & Whiting (1975) use the label, the "aloof societies." They document an association between spouses sleeping apart and male aggressivity. In their theory, male children deprived of father contact compensate by becoming hyper-masculine and aggressive (notice the effect contradicts the simple hypothesis that male children learn aggression from frequent contact with their fathers, since father absence would then reduce aggressivity). The provisioning versus mating model suggests that tropical selection for mating success produces both polygyny (which leaves males with less opportunity to interact with their children) and male aggression.

As an additional factor, males not selected for provisioning would be less nurturing, and would not desire to spend time with small children. This would make them more likely to live away from their wives. In addition, a hyper-masculine male would not be very pleasant to live with, and the wives would probably be content to live apart from him. Part of the individual level correlation between criminality and father-absence (R. Anderson, 1968) may be due to "hyper-masculinity" leading to both.

Likewise, White and Burton (1988) have documented a relationship between warfare and polygyny. While the mechanisms they describe (such as marrying captives) are plausible, an alternative is that both result from a complex of traits, including aggressiveness, that reflect selection for mating success. White and Burton end their paper by noting that their model works less well for the New World, where the polygyny is different from the general polygyny they describe. They note (p. 884) that, "Much of New World polygyny appears to be of a different pattern, in which wives tend to be related to one another and to live in the same house." As noted, the genetic theory proposed here predicts lower rates of general polygyny in the New World, whose natives descended from relatively recent North Asian immigrants.

TESTING THE THEORY WITH OTHER POPULATIONS

The above sexual selection theory was developed by considering the data assembled by Rushton on the major races, Mongoloid, Caucasoid, and Negroid. As seen, it seems to fit well.

However, there are other groups which are often considered distinct from the major races, Australian aborigines, the "brown" people of Southeast Asia, Polynesians, Micronesians, etc. Other populations appear to be mixtures of original populations. A climatic adaptation theory predicts that populations evolving in the tropics will resemble Negroids in their behavior and life history. Differential K theory makes no such prediction until it is specified how variable or predictable the area they evolved in is. If it is tropical rain forest, it would be of low variability, and one would expect them to be K selected.

While the writer's impression is that these other groups do resemble Negroids more than they do Mongoloids in their behavior, no systematic investigation has been undertaken. These peoples provide a holdout population that others can use to test the hypothesis proposed here.

An interesting population to examine would be the pygmies of various tropical rain forest groups. Their diminutive stature shows that they have been separated from their neighbors long enough to be physically different. These are predictable climatic areas, for which differential K theory would predict K traits. It is here hypothesized that they will have most personality and life history traits similar to those of their tropical neighbors.

Climatic theories predict gradual shifts in gene frequencies. As one moves towards the Arctic, isolated populations should evolve more in the Mongoloid direction. The theory here predicts that the more cold adapted groups among the major races, such as the Eskimos among the Mongoloids, will exhibit an even greater contrast with the tropical peoples than typical Mongoloids. Likewise, as one moves south, the behavior should shift in the tropical direction. Thus the northern European Caucasoids should resemble the Mongoloids more than those further south, and the Mediterranean Caucasoids should resemble the Negroids more. While formal studies appear lacking, the reported greater sociability, macho complex (Peristiany, 1965), and acceptability of mistress keeping among Mediterranean peoples, and the higher levels of behavioral restraint further north, appear to be as predicted by the existence of a male provisioning versus mating cline.

Thus, the provisioning versus mating theory is testable. Hopefully, further research will test it.

CONCLUSIONS

Offspring survival in cold climates requires provisioning by male hunters, while it is not critical in warm climates. Thus, the optimal male tradeoff between seeking copulations and provisioning depends on the climate. Hence, the colder the climate a population evolved in, the more they should have evolved drives that lead to provisioning (altruism, sexual restraint, rule following behavior) while in tropical areas the drives should have evolved towards competing for mating opportunities (which implies dominance seeking, aggression, high masculinity, extraversion etc.). This can explain many of the observed differences between the major races. While cultural explanations exist for many of the behavioral differences, they are unable to explain such differences as body build, genital length, muscle structure, bone structure, the size of the liver, testosterone levels, and monoamine oxidase levels, all of which are explained by the paternal investment versus mating success theory.

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Footnotes

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*(1) One exception to the rule that women seldom hunt large game is known. Among the Agta of the Philippines, hunting groups with only women and children brought back 30% of the large game animals (Goodman, Griffin, Estioko-Griffin, Grove 1985, p. 1204). In this particular tropical environment women successfully hunted deer and pigs, sometimes carrying nursing babies, and did so without affecting their reproductive success. Unlike the men, who frequently stalked their prey or ambushed them from a tree, the women used a drive with dogs (where noise from children and babies would be less of a problem). There are several reasons why this case does not prove that women typically could have supported themselves by hunting alone in the prehistoric environment. Dogs were probably not available then. The rich environment of the Agta facilitates brief hunting excursions, after which women can return to their children. The short distances to the hunting grounds probably explains their observed willingness to carry nursing infants with them on the hunt, and their ability to carry both infants and game back home. Although some hunting is done carrying nursing infants, in other cases the children are left with others at camp. Presumably there are some toddlers too old to be carried and too young to walk far themselves. The Agta do not get most of their food from hunting, and it is not clear that their females' hunting efficiency would have permitted prehistoric women to provision themselves, especially if cooperative child care had not yet emerged. Even if such child care were available, the labor needed for it would have to be subtracted from the labor available for hunting.

*(2) Ember (1978) has disputed the findings that in most hunter-gatherer societies gathering is

more important than hunting and that females collect most calories. She finds that in sub-Saharan Africa and the insular Pacific (both predominantly tropical)e.

*(3) Negro women have also been found to be more mesomorphic than white women, but the difference is less than in males (Damon et al. 1962, p. 470).

The Limited Plasticity of Human Intelligence

by Arthur R. Jensen

As societies become increasingly technological, the demand for superior intelligence begins to exceed the supply, and the demand for sheer physical labor begins to decline. Increased leisure, early retirement, and a lengthened life-span all raise the premium on intelligence for the social and moral well-being of society. With the eradication of malnutrition and infectious childhood diseases, and as universal public education and the amenities of our technological civilization become more widespread, the improvement of human intelligence, if it is to come about at all, will depend increasingly upon eugenic means. We are now gradually emerging from a period of over-optimism regarding the supposed plasticity of intelligence, and the hope of appreciably raising the IQ of those with below-average intelligence through strictly psychological and educational methods. This hope is probably as old as humanity itself. Widespread faith in its practical implementation originated in the 1920's with the radical behaviorism espoused by John B. Watson. Watson's behavioristic conception of intelligence has pervaded psychology even to this day, although it has lost favor among the new generation of researchers in experimental cognitive psychology and psychometrics.

In the behavioristic view, intelligence became equated with learning. Man's "original nature", psychologically, consisted only of an undifferentiated, general capability for learning. All that developed throughout the course of evolution was an ever-increasing plasticity of the brain for being shaped by the physical and cultural environment. Human mental capabilities were viewed as wholly a product of learning. The wide range of individual differences (except those resulting from some form of brain damage) was attributed to differences in opportunities for learning, or to differences in the content of learning. It was believed that these differences became socially salient merely due to the fact that some forms of knowledge and skills are more highly valued than others in a particular society.

Accordingly, what Western industrial societies recognize as "intelligence" and measure by means of standard IQ tests was viewed only as a specialized collection of particular bits of acquired knowledge and skills which happen to be valued within a specific cultural context. Given the view of intelligence as essentially a product of learning, it was reasonable to expect that intelligence itself could be taught much the same way one teaches reading or arithmetic. It led to the optimistic expectation that the intelligence of children in the bottom half of the IQ distribution could be dramatically raised by providing them with early learning opportunities like those enjoyed by children in the top half of the distribution. The well-established correlation between children's IQs and their parents' socioeconomic status (SES) was accorded an erroneous causal significance: Low SES children were believed to have lower IQ's and to achieve less well in school because they lacked the cultural advantages and learning opportunities enjoyed by children from higher SES backgrounds.

Over the past three decades, hundreds of experiments, many carried out on a massive scale, have sought to prove that intelligence can be substantially raised. In a few studies, subjects were given intensive training over a period of several years. No other field of psychological or educational research has commanded such vast funds nor marshalled such concerted efforts on such a grand scale. The truly remarkable finding is not the few points gain in IQ or scholastic achievement occasionally reported, but the fact that gains are so seldom found, and, when they are found, that they are so very small. The theoretical implication of this finding is that the behaviorist view of intelligence as synonymous with learning (or the products of learning) is seriously in error. Predictions based on this view have repeatedly failed to materialize under the prescribed conditions.

When gains in test performance have occurred as a result of educational treatments, they have displayed one or more of the following characteristics: (1) they have been small, rarely more than five or ten IQ points; (2) they have been of short duration, fading out within a year or so after the training has been completed; (3) they have been restricted to tasks or tests which closely resemble the actual training procedures themselves, and have failed to generalize to a broader range of mental tests.

Although I have scoured the research literature, I have yet to find a bona fide empirical demonstration that any psychological or educational techniques have succeeded in significantly raising children intelligence. Scores on one particular test or another, or achievement in particular scholastic subjects, may have been raised, usually only temporarily. But these gains are not reflected across a wide variety of tests or school subjects, as would be the case if it were *g* itself (the general intelligence factor) that had been improved. This conclusion is reinforced by evidence reported in a recent book which summarizes much of the best research and thinking in this field (Detterman and Sternberg, 1982).

The limited plasticity of intelligence can be more easily understood in terms of the newly ascending view of intelligence as comprising a small number of elementary information-processing capabilities which are closely dependent upon properties of the central nervous system. Learning itself is only one of many manifestations of these elemental processes involving stimulus encoding, discrimination, comparison, short-term memory capacity, speed of transfer of information from short- and long-term memory, and the like. The fact that ordinary IQ tests measure something more fundamental than acquired knowledge is demonstrated by the correlation of IQ with performance on laboratory tasks, such as reaction time, which have virtually no intellectual content whatsoever, but which directly measure elemental information-processing capacities (Jensen, 1980, 1982a, 1982b). That these information-processing capabilities are closely linked to brain functions is shown by correlation of both IQ and reaction time measures with brain-wave measurements (termed average evoked potentials) (Hendrickson and Hendrickson, 1980; Jensen, Schafer, and Crinella, 1981).

It is now generally accepted that individual differences in IQ and information-processing

capacity are strongly influenced by hereditary factors, with genetic variance constituting about 70% of the total population variance in IQ (Jensen, 1981). There is also evidence that the genes for superior intelligence tend to be dominant, which is what would be theoretically expected if intelligence is a fitness character in the Darwinian sense, and if it had been subject to natural selection through the course of human evolution (Jensen, 1983).

The genetic and evolutionary view of human intelligence affords a possible explanation for its quite limited plasticity. If intelligence has evolved as an instrumentality for the survival of Homo Sapiens, it could well be that its biological basis has a built-in stabilizing mechanism, such as that of a gyroscope. Some degree of homeostatic autonomy in the ontogeny of mental ability would safeguard the individual's capacity for coping with the exigencies of survival. Mental development then would not be wholly at the mercy of often-erratic environmental happenstance. A too-plastic malleability would give the organism little protection against the vagaries of its environment. Hence, there may have evolved homeostatic processes to buffer the semi-autonomous ontogeny of human intelligence, protecting it from being pushed too far in one direction or the other, either by adventitiously harmful or by intentionally benevolent environmental forces.

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Caring for Posterity

Alan McGregor

Institute for the Study of Man

BEYONDISM: RELIGION FROM SCIENCE

Raymond B. Cattell Praeger, New York

Author Raymond B. Cattell, a member of the editorial advisory board of this journal, has sometimes been called "Mr. I.Q. Test" because of his role in developing IQ and Personality tests. His Sixteen Personality Factor test is a standard tool in educational circles to this day. His contribution to scholarly knowledge is impressive when measured by volume alone, totalling as it does over forty books and more than 450 scholarly papers published to date. More recently his concern has turned to the problem of survival facing mankind, dependent as mankind is on the preservation of an appropriate heredity.

Cattell's long history of psychological research has enabled him to demonstrate that mankind is not in any way different from other biological organisms so far as the significance of heredity is concerned. Science is rooted in causality, and the limits of the behavioral potentiality of every individual are largely set by heredity at the time of conception. Environmental life-history will influence the subsequent behavior of the living organism, and some scientists have attempted to evaluate the relative importance of environment and heredity in terms of statistical figures. Such figures relate only to specific concepts, specific situations and specific groups, such as the ability of diverse individuals and groups to perform effectively in response to a battery of intelligence or personality tests. This can cause less rigorous thinkers to assume that heredity and environment are two forces which are in opposition to each other. This is not the case. Heredity determines the way the human machine is constructed, and environment operates upon the machine and influences what it will do, or even how long it will survive. One might use the simile of a computer. What can be done with a computer depends upon the way it is constructed. But what you can get out of it will depend upon what data is fed into it.

In consequence of his profound consciousness of the role of heredity in determining the human potential, Cattell has for many years been concerned that the quality of the genes that are handed on to future generations of mankind should be high. Such a statement often leads to immediate criticism on the grounds that "high quality" implies an objective scale of values against which we may measure human ability. It brings us into the realm of ethics and, of course, religion.

Conscious of the fact that any argument favoring eugenic concepts or stressing the importance

of what is colloquially called "good inheritance" involves an excursion into the realm of ethics, Cattell attempts in this impressive work to penetrate the field of ethical philosophy and as a good scientist he asks: what can science tell us about ethics? How can we derive an ethic of human behavior, a scale of values which might direct human enterprise, from scientific knowledge? Clearly, science has given us the power to understand many things, and to modify our environment even ourselves - in ways hitherto unimaginable. But in what way should this knowledge be used? How can science help us to create a sound ethical system which will enable us to act for the benefit of all those generations yet to come, to shape the future world "beyond" the span of our own lifetime? Cattell's initially rather surprising title for this book, *Beyondism*, is derived from that one important, over-riding ideal - if we are truly concerned with the good of the greatest number, he argues, let us remember that we should be asking how our actions will influence the future of all those generations yet to be born. We should think beyond the horizons of our own life-span, and constantly bear in mind the welfare of posterity. Our prime concern is that we should leave to future generations a healthy genetic heritage, including a high level of intelligence combined with a set of ancillary inherited qualities, not excluding personality, which will best enable the unborn generations of future men and women to tackle the problems that will inevitably confront them, many of which we cannot even envisage at this present time. Thus "the greatest good for the greatest number" means the greatest good for the future of humanity, for mankind 'beyond' the limits of our own short selfish life-spans.

Cattell defines "Beyondism" as a system "for discovering and clarifying ethical goals from a basis of scientific knowledge and investigation by the objective research procedures of scientific method."

On what objective "realities" can science seek to base morality? Cattell answers as follows:

"However, it is in the realm of interpretation that Beyondism demands an act of faith by which it may seem to stand or fall. The Berkeley-Descartes issue we are content to answer with "The universe exists." What Beyondism requires in addition is the interpretation that "Evolution exists as a paramount fact within this universe." Thus, if we wish to be as tightly logical as a Euclidean proposition - which we need if we claim our position to be logically sound - we have to recognize these two assumptions or presuppositions."

Since we assume the reality of the universe, and the findings of science, we must conclude from our understanding of evolution that species and subspecies, although changing through time, are more real in the sense of being durable, of persisting, than are individuals. In fact, individuals are little more than links in the ongoing, intergenerational chain that is life. Individuals are important in that they hold in trust the genes of the subspecies, and they are also important in that the future potential for the subspecies depends upon which individuals live and reproduce successfully, and which die without offspring. The reproductive fate of individuals shapes the future of the group!

"The selection has finally to operate, literally, on individuals, but often the results are well summarized and understood by considering the effect on groups either as (1) a species, interbreeding and having common characteristics, or (2) an organized group. with roles, rules, and social structure - say a nation."

For life to survive, and for our own kind of life form in particular to survive, it must maintain and develop further the ability to cope with changing environmental conditions. In the case of mankind, the key to survival is increased intelligence, involving selection at both the individual and the group level.

"In organized groups, as, for example, in primate and human societies, the possible relations and results are somewhat more complex. Thus, although all survival ultimately takes place as survival of individuals, it is overconcrete and unsubtle thinking to overlook that it is nevertheless the ultimate interactive properties of the species or group as such that greatly determine evolution. The concrete view would say that the death of an individual, for example, is nothing more than the death of a lot of cells, yet obviously something more important than the cell dies. The individual cell contains the plan of the whole body, but when the body dies all cells must die. In the analogue of the whole social body this is only approximately true, but close enough to find a considerable reduction in the population type when a culture dies.

Natural selection is going on simultaneously between groups and individuals within groups. As we shall see, within-group selection has to conform to the demands of between-group selection. This was not understood when Darwin and Wallace first put forward the theory of evolution by natural selection, for people thought it rested principally on conflict among individuals. Some philosophers and even some scientists have argued that humankind has now evolved to a point in history at which group selection is no longer relevant, and that only individual selection will henceforth be operative. But Cattell disagrees:

"With the second objection - that we know what progress is and can accordingly abolish group natural selection - Beyondism is in fundamental disagreement. We can peer ahead a little way, with the help of historical perspective and reasoning - and even penetrate the fog a little farther when a truly potent social science is built up - but the wisest never could, and probably never will, be able to foresee the ultimate effect of inventions and social legislations. Evolution is no more a straight line than the course of a ship sounding its way through uncharted channels. History books could be and have been, filled with the untoward and ludicrous results of labors of well-intentioned but unimaginative social reformers, who "know what's best."

Thus Cattell places importance on internal group collaboration to ensure the survival of the group in its prevailing environment. He also perceives that that "environment" includes competing populations and subspecies:

"What we have to make clear here is the relation of natural selection among individuals to that

among groups. The contribution between group and individual is a two-way affair. In an obvious sense, a group cannot exist without individuals, and it has been argued that an individual who is to come to fullest use in progress cannot exist without a group. It is thus true that we have a causal chain in what systems theorists call a "feedback" action, in which individuals help shape the group and the group helps shape the individual. (One says "helps" because both individual and group get part of the shaping from the physical environment). This statement of course applies to both cultural and genetic shaping, recognizing that different genetic predispositions will respond differently to schooling. It follows from the above that we do not have a complete symmetry where natural selection comes in. If the genetic and cultural shaping of individuals must yield a viable group, then that shaping has to be something that fits the survival of the group in its interactions with other groups and the environment. The conditions of survival of the group must determine the conditions for survival of the individual - not vice versa.

The environment of any group, such as a nation or a business corporation or a religious sect, is partly (a) the collection of other groups and (b) the physical universe. Putting aside variance due to size, natural resources, etc., we shall accept here and elsewhere, from the evidence of correlations in modern nations and of history, that nations, tribes, and other groups tend to rank in the same order in (1) competing with other groups and (2) in their mastery of their environment. This is not merely because mastery of the environment gives better economic and military weapons, but because the general intelligence that begets one tends to beget the other."

At earlier levels of evolution, when the hominid population was less numerous, group competition was between tribes and even smaller groups, known as bands. In the modern world, although Cattell does not ignore the any lesser subdivisions that divide nations into smaller breeding groups, he sees the major competing groups still as nations - possibly because nations share a common language and a common territory or breeding ground:

"Those organized groups tend to be nations. As Sir Arthur Keith summarizes, "Most of my colleagues regard a nation as a political unit, with which anthropologists have no concern, whereas I regard a nation as an 'evolutionary unit' with which anthropologists ought to be greatly concerned. The only live races in Europe today are its nations." The great size of the nation, relative to the small familial tribes along which the evolution of group qualities formerly took place, slows up the natural selective process, but that is necessary to produce the "large group" characters we now need."

Technology and culture have always played a prominent role in determining success in a conflict between hominid groups. But while both tend to be linked to genetics, in the long term it is the genetic heritage which is the most precious, as culture depends on its genetic base, and once the genetic base decays so must the culture:

"...but though Man is extreme in the proportions of behavior influenced by culture, it is a

colossal mistake to ignore the genetic forces in his culture. And as Havelock Ellis long ago reminded us, 'there is nothing so fragile as civilization, and no high civilization has long withstood the manifold risks it is exposed to.' The genetic survives."

Not only does civilization depend upon a sound genetic basis for its survival, but continued technological achievement of the calibre that may be required for the survival needs of future generations may necessitate further genetic evolution. The problem facing the West today is that the prevailing ethical system is blind to science, and pays no regard to evolutionary reality. A culture can destroy a people if it loses touch with reality, and Western ethical teaching has in general lost touch with evolutionary reality. The ancient civilizations of early Republican Rome and early Greece, even of the pre-Christian Germanic peoples, did reveal some comprehension of the causal reality that governs living organisms. It was no accident that science flourished in pre-Christian pagan Greece, when men like Archimedes, Pythagoras, Aristotle and Plato had inquiring minds, or that all early Greeks believed implicitly in inequality and in the superiority of genetics - of the "blood line." But all this changed with the coming of Christianity, which preached not only the equality of all God's children but also the moral superiority of blind unquestioning obedience to the "revealed truths" of the prophets as preserved by the church leaders. It was the Byzantine Christian emperors who finally closed Plato's ancient academy, because to them even to question Church doctrine was heresy. Cattell himself does not say all this, but he warns against "revealed" religions and it is clear that he believes the prevailing morality of the West is not merely scientifically irrelevant but positively harmful. That is why he believes that the most important objective remaining after his many distinguished accomplishments is to awaken the West, and indeed, all humankind, to the need for ethical values to be brought into line with the frontiers of scientific thought.

Thus, Cattell complains, contemporary Western ethical theory condemns "inequality," and yet biological inequality is the very stuff from which evolution is made. Clearly, the prevailing prejudice against any and all forms of inequality (as distinct from solely legal inequality) is a threat to the future of the West, and individually to all humankind:

"The most common rhetorical reaction to inequality is that it is "unjust." Indeed, in much of the popular media one could easily conclude that the terms inequality and injustice are synonymous! Here we run again on to the confusion over "rights" discussed elsewhere. Our society today declares that all have a right to equal opportunity, while our religions, including Beyondism, declare that all have equal spiritual worth and rights, i.e., the rights to the dignity of an unknown potential. Rights have to be contracts, and so far as an individual signs himself into a state or church, his rights are to the equalities just indicated. But biologically he has no contract to equality, and, if we suppose some supreme being to have designed the universe, it would seem that such rights were never intended. One has then only the right to variation and adventure on the course of evolutionary advance.

As for the relation of inequality to injustice, some common-sense citizens have, as we have

seen, added the viewpoint that "injustice is the equal treatment of unequals." It is clear that if we take off from the premise that the group has, if possible, to survive, then equal treatment of unequals is unethical. One would not spend large resources of physical education funds to train a man of diminutive physique for the Olympic shot-put competition, or endow university scholarships for individuals of, say, I.Q. 80 or less.

Confusion over the meanings of equality, justice, and freedom have caused much bloodshed, and threaten all real social progress."

So what positive values does Cattell attribute to those who are concerned with the future of mankind "beyond" the limits of their own life-span? Essentially these are summed up in what he calls a Beyondist catechism - a very lengthy but highly persuasive list of principles and arguments. This may be briefly summarized as follows: Evolution is the prime process visible in the universe, and to survive mankind must develop a strategy, a culture or an "ethic," if you will, which is in harmony with this basic set of conditions.

Evolution proceeds by selection between individuals and between groups. A genetic panmixia for humanity would not only be dangerous - being contrary to evolutionary principles - it is questionable, in fact, whether it ever could be achieved.

Groups are genetic realities and are in competition for genetic survival and proliferation. Groups which adopt an evolutionary-positive ethic have a far better chance than those which select an evolutionary-negative ethic - who have no long term chance of surviving by definition. In addition, groups which adopt a positive evolutionary ethic, and reinforce this by a strong sense of group identity and a high level of in-group Cooperation and loyalty, have a better chance of surviving than those which adopt the universalist ethic characteristic of "revealed" religions.

Finally, even successful groups must still accept the idea that they must continue to evolve, and that inequality between individuals within the group is a biological and evolutionary reality of positive significance. Such groups must be prepared to orient their lives according to social systems which will reinforce the ethical priority of providing future generations with the best possible genetic armory with which to face the unimaginable variety of challenges which lie hidden from contemporary vision by the veils which obscure the future.

The Evolutionary Function of Prejudice

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The author examines the phenomenon of 'prejudice' and explains the possibility that its roots are not purely cultural. The proclivity for prejudice appears to be deeply rooted in the human psyche, and has been shown to be of distinct utility in furthering the process of speciation.

The sociobiological nature of 'prejudice' can only be clearly understood if we realize that the emotional tensions generated when diverse ethnic groups are forced into close geographical contact do not derive solely from contrasting cultural systems: they reflect deeply ingrained sociobiological mechanisms which serve an essential evolutionary function. Indeed, they are by no means of modern or even recent origin in the history of our species.

Like other animals, man is little more than a pawn on the chessboard of evolution. The basic patterns of human behavior and of human emotions had already been determined by evolutionary forces long before persons of diverse biological and cultural background were thrown together within the confines of densely populated modern societies. To properly understand the origin, nature and function of prejudice it is necessary for us to examine the biological role of the emotional tensions associated with "in-group" and "out-group" relationships - including racial relationships - in the evolutionary history of man. We must identify the evolutionary purpose of ethnic consciousness and of the sense of 'racial distance' that has tended to keep populations of diverse racial background genetically distinct from each other through hundreds of thousands of years of evolutionary development.

The Evolutionary Process

What do we mean by "evolutionary development"? Evolution is a process of organic change by which new forms of life are constantly arising and replacing others less suited to survive in a state of competition. The new concept of bio-social studies properly emphasizes the close relationship between the biological and social sciences, showing how even social behavior evolves under the selective guidance of a single arbitrating principle: the survival of the species.

Evolution reveals two major trends, the first of which is a trend from the simplicity of unicellular life forms to the complexity of advanced organisms such as are represented by mammals, primates and men. The second is the trend from the primitive uniformity of early life forms to the rich variety of diverse species, sub-species, or, in the case of man, the diverse races which today inhabit the earth. Both trends - the trend towards increasing complexity and the trend towards increasing diversity of life forms - depend on the genetic isolation of discrete

populations. In the case of simpler life forms, geographical distance by itself may be sufficient to ensure genetic isolation, but the higher more mobile forms of life require other defenses to prevent the accidental hybridization of evolving sub-species. Clearly, the evolutionary process would be frustrated if every new biological or evolutionary experiment, each new phylogenetic continuum, sub-species or race, were to lose its novel and distinctive combination of genes by admixture with sibling populations, or by the reabsorption of divergent sibling populations into the parental stock. In short, during the period in which emerging sub-species are evolving into separate species - so different from each other that they no longer have the biological ability to crossbreed their genetic identity must be protected from crossbreeding by some form of barrier, either geographical or psychological, which will effectively prevent the negation of nature's experiments before they can even emerge as separate species and subspecies.

The important role of racial differentiation in the evolutionary process was clearly perceived by Dobzhansky as early as 1937, when he observed that:

If (the) differentiation is allowed to proceed unimpeded, most or all of the individuals of one race may come to possess certain genes which those of the other race do not. Finally, mechanisms preventing interbreeding of races may develop, splitting what used to be a single collective genotype into two or more separate ones. When such mechanisms have developed and the prevention of interbreeding is more or less complete, we are dealing with separate species. A race becomes more and more of a "concrete entity" as this process goes on; what is essential about races is not their state of being but that of becoming. But when the separation of races is complete, we are dealing with races no longer, for what have emerged are separate species.

However, Dobzhansky continued: Races and species as discrete arrays of individuals may exist only so long as the genetic structures of their populations are preserved distinct by some mechanisms which prevent their interbreeding. Unlimited interbreeding of two or more initially different populations unavoidably results in an exchange of genes between them and a consequent fusion of the once distinct groups into a single greatly variable array. A number of mechanisms encountered in nature (ecological isolation, sexual isolation, hybrid sterility, and others) guard against such a fusion of the discrete arrays and the consequent decay of discontinuous variability. The origin and functioning of the isolating mechanisms constitute one of the most important problems of the genetics of populations.

As Dobzhansky added, genetic isolation becomes "advantageous for species whose distributions overlap, provided that each species represents a more harmonious genetic system than the hybrids between them."

Essential Feral Restraints

To prevent the negation of Nature's work of species-creation, we find that all higher more

mobile animals living under feral (natural) conditions not only evolve a sense of territoriality, whereby they become isolated or at least semi-isolated genetically on a geographical basis in what are known as demes, but that they also develop what zoologists call "feral restraints," that is a marked unwillingness - amounting often to a positive refusal - to interbreed with members of other sub-species. These "isolating mechanisms" may be seen as "agents to ensure the mechanism that keeps them (the separate sub-species or races) on their peaks by preventing ... hybridizing" (Paterson, 1978). To the extent that emerging species involve the selective development of new patterns of harmoniously interrelated genetic qualities, hybridization can be devolutionary in its impact, creating what S. Wright (1956) has referred to as "the formation of unharmonious constellations of genes."

The geographical isolation of separate sub-species or races, each in the process of evolving into disparate species, will often be sufficient to protect the evolutionary process from any genetic intermingling of the new "experimental" varieties before they have become sufficiently differentiated to be biologically incapable of miscegenation. But geographical separation is not always effective in the case of the more advanced mobile forms of animal life, and various "feral restraints" also customarily evolve to discourage cross-breeding on those occasions that individuals from divergent populations do chance to meet.

These feral restraints serve a vital evolutionary process. Zoologists have identified two types of such constraints, the first of which are called - "built-in" constraints, based upon physical sign stimuli. "Built-in" physical constraints may take the form of distinctive shape, color, smell, or even patterns of movement, common to animals of the same subspecies, but absent from other populations. Such distinctive characteristics serve as a warning to members of related but disparate subspecies not to attempt sexual relationships. They are like a sign that reads "Danger! a new biological experiment is in progress. Do not approach!" (Simpson, 1964). But in addition to these built-in constraints, the distinguished zoologist, Peter Klopfer, (1970) has shown that acquired constraints exist among feral animals due to behavioral imprinting. These may be equated with the culturally-reinforced prejudices associated with "in-group" and "out-group" behavior among human beings.

Domestication Distorts Innate Behavior Patterns

Domestication, by breaking down territorial restrictions and destroying patterns of feral or natural activity, often results in perverted, misdirected, unnatural and anti-evolutionary behavior. The innate drives of domesticated animals generally express themselves in a confused and evolutionarily useless variety of patterns, while the behavior patterns of caged animals may become more extensively deranged. Not only do they often refuse to eat, but those that do eat may experiment with masturbation and homosexuality, or even seek to mate with animals of other breeds (Calhoun, 1962) - an activity which, regularly and consistently repeated, would necessarily negate any further speciation or racial diversification. Culture, particularly in urbanized societies, may likewise pervert human instincts by suppressing natural feral

constraints and encouraging abnormal patterns of behavior, leading to similar distortions of normal biological behavior, such as homosexuality and the quest for abnormal erotic experiences, including those associated with inter-subspecific sexual experimentation. No human civilization has to date avoided collapse, and it is tempting to enquire whether social conditions which diverge too widely from the natural or feral conditions under which mankind evolved - and to which humankind is biologically adapted - may weaken the survival potential of over-domesticated populations by promoting anti-evolutionary life-styles, together with their concomitant reproductive abnormalities.

The Sociobiological Role of Prejudice

The sociobiological significance of prejudice becomes even more apparent when we realize that evolution arises not solely from individual competition. Team spirit and group cohesiveness have a high survival value for those mammals and primates which have adopted a pattern of group life. Furthermore, the concept of the survival of the fittest among social animals such as man refers less to individuals than it does to breeding populations and entire sub-species. Indeed evolution is concerned not with the individual organism but only with breeding populations, with phylogenetic continua. Evolution involves populations, sub-species and species. Evolution is in no way concerned with the welfare or well-being of any one individual organism except to the extent that the death or survival of that organism may affect the gene pool of the breeding population.

Fitness also must not be misunderstood. In the evolutionary context - by which we mean the living reality - fitness means only the ability of any breeding population, sub-species or race to reproduce itself, and, at the more complex mammalian, primate and human levels, the ability of adults to protect their offspring until the offspring can in turn successfully reproduce themselves. Biologically, an individual is little more than a link in the chain of generations. The genetic integrity of the gene pool is therefore of paramount evolutionary importance. Evolution could not continue its work amongst the higher animals if each new experimental sub-species were to lose its identity before it had time to evolve into a new species.

The Importance of the Genetic Isolation of Races

Evolutionary competition is between rival sub-species. It is concerned with breeding populations, not with individuals as the Social Darwinists have too often erroneously assumed, overlooking the fact that Darwin specifically emphasized this when he chose to name his epic work *The Origin of Species by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life*. Indeed, cooperation at the primate and human level is aimed more at group survival than individual survival. Social cooperation in the primate troop and in the primitive human band arose as an evolutionary necessity to ensure the survival of the group as a distinctive phylogenetic breeding population. As G.G. Simpson (1964) has explained, the genetic isolation of races as emergent species is a matter of "great evolutionary significance."

The genetic advancement of man arose as a result of ongoing competition for survival between genetically different, non-interbreeding hominid populations, and was sustained not merely by geographical isolation but also by developing bonds of cooperation and love within the kindred, and of suspicion, fear, antagonism, and even warfare against such alien groups as might become competitors for the territorial and material resources necessary to sustain life.

That the evolutionary struggle is commonly fiercest between closely related species, and particularly between sub-species who are dependent on and consequently competing for similar resources, was recognized by Dobzhansky, Ayala, Stebbins and Valentine (1977), who wrote:

Related species compete for resources that both are in need of, and one species may outbreed and crowd out another ...

In their earlier more feral existence at the level of the primate troop, the human band, and the human tribe, man's forebears consequently developed a capacity to distrust and repel those they perceived of as alien, as well as to love and to assist those whom they identified as allies. Every member of every human group has ever since experienced two different sets of reactions when dealing with others: one of loyalty towards members of the in-group, the other of caution and competitiveness towards members of the out-group. Ludwig Gumplowitz referred to these two separate sets of behavior as syngenism (attachment and loyalty) and ethnocentrism (suspicion of aliens). He further suggested that the pressure of competition from other groups tended to reinforce the feelings of loyalty and cooperation, heightening the consciousness of ethnocentrism and prejudice against "outsiders." These forces enhance the competitive viability of the group in its struggle to survive and to outbreed rival groups, and also serve to protect the ongoing process of homogenization within the group's own gene pool - a process which is itself dependent upon a high degree of genetic isolation.

Conclusion

These attitudes of in-group loyalty and out-group suspicion, which appear to have evolved long before the evolution of primitive human bands and to have developed more consciously identifiable forms at the level of tribal and national societies, reflect a clear-cut evolutionary purpose. Patterns of racial and ethnic prejudice, of in-group loyalty and out-group suspicion, have served an effective evolutionary purpose over the long history of primate and human biological evolution, both in enhancing the competitiveness of the individual breeding population and also in preserving the uniqueness of its distinctive genetic heritage by discouraging interbreeding with the members of disparate sub-species. The evolutionary message is clear. Human groups which lose their internal sense of identity and cohesion in respect of other groups eventually cease to exist as discrete realities. Amongst the higher more mobile forms of animal life, isolating mechanisms such as prejudice are necessary to preserve the genetic identity of races and sub-species (as emergent species) by inhibiting miscegenation. A human population which practices endogamous marriage and strives to preserve the integrity

of its gene pool should not be criticized as immoral. Such behavior implies that it is adhering to deeply rooted instincts essential to the evolutionary process, which process - from the point of view of purely logical, naturalistic thought - provides the only basis for any scientifically sound system of ethical philosophy.

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Questions and Answers on Eugenics

by Marian Van Court

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1. Doesn't it say in the Declaration of Independence that all men are created equal?

This is an objection which is frequently brought up. It goes "We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness." This means they are equal before the law, that government can't (or shouldn't) take away these fundamental rights. The historical record is quite clear that the Founding Fathers meant equal before the law, not that everyone was born equal in intelligence, talent, or athletic ability. Their other writings amply attest to the fact that they did not believe in biological equality--between individuals, or between races. A number of them were slave-holders. In a letter to John Adams, Thomas Jefferson rejected the aristocracy based on one's birth as an artificial one, and spoke of "the natural aristocracy of talent and virtue," which he felt was our country's most precious gift. (And isn't that a lovely turn of phrase to express what he valued most highly?!)

2. When you say that high IQ people are having fewer children, aren't you equating social status with intelligence?

No, but you're correct if you're thinking that there's also a social class gradient for number of children (that, on average, high SES people have the fewest, then average SES, then low SES have the most children). This SES gradient exists, but so does an IQ gradient.

In 1984, I did a study (with Frank Bean) of IQ and fertility in the United States. It was published in the journal *Intelligence*, 9, 23-32, 1985, "Intelligence and Fertility in the United States: 1912 to 1982". [Anyone who wants a reprint may contact me.] In this study (N>6000), we used a very short IQ test, and correlated the score with number of offspring for 15 cohorts born between 1894 and 1964. All correlations were negative, 13 were statistically significant, and 7 were beyond the .001 level. At this rate, we lose about 1 IQ point each generation. I'm currently working on another fertility-IQ study, and finding similar results. We don't need to be able to identify specific genes for intelligence in order to conclude that genotypic intelligence is declining, because we know intelligence is highly heritable.

3. Is there something inherently bad about having a low IQ?

Yes! From the standpoint of our whole society, it's very, very bad. I personally have known people with low IQs whom I loved and respected, some so honorable, hard-working, and pleasant to be with I'd choose them over an unpleasant or obnoxious high-IQ person if I had to be stranded with only one companion on a desert island. But collectively, in terms of society, they constitute a tremendous liability. Low IQ people are much more likely to be criminals, chronically dependent on welfare, unemployed, illiterate--in fact, they're way over-represented in every category of social problems. They cost taxpayers billions of dollars annually. This may sound abstract, but it all translates very clearly into human misery!

The Bell Curve, by Herrnstein and Murray, is a brilliant book. I hear it's now out in paperback for only \$16. It looks a bit daunting because it's kind of long, but it's wonderfully well-written, and easy to read. It explains the role of IQ in our society far better than I can here. Anyway, the authors found that when they moved the average IQ of their sample down statistically by just 3 points, from 100 to 97, all social problems were exacerbated: the number of women chronically dependent on welfare increased by 7%; illegitimacy increased by 8%; men interviewed in jail increased by 12%; and the number of permanent high school dropouts increased by nearly 15%.

Everyone should be treated with respect, even retarded people, but compassion requires us to face the fact that they are a big drain on our economy, not to mention the economy of the future. This is why low IQ is inherently bad.

4. In the British Medical Journal (# 7108, September 6, 1997, p. 563) there's an article entitled "Thousands of women sterilized in Sweden without consent." The Swedish government is investigating why thousands of women were forcibly sterilized on eugenic grounds from the 1930s to the 1970s. There are similar allegations about forced sterilisations in Switzerland, Austria and Finland. Is this the kind of thing you support?

There's not enough information in this article to evaluate these programs. The fact that political correctness has spread to Europe--that they now say "Oh, isn't this terrible?" is irrelevant. What really matters is whether the programs were actually fair and humane. Over the years, I've tried, without much success, to get articles on eugenics programs in European countries that continued on long after WW2. There don't seem to be many articles (or at least I haven't been able to find them), and then there's the problem of having them translated. Since I know so little about these programs, I can't comment on their fairness or efficacy. Getting more information about them is important, though, because whether they were sound, misguided, or somewhere in between, surely something can be learned from their experiences.

This article conjures up horrible images: a young woman--selected for no good reason--is dragged from her home, kicking and screaming, pinned to the operating table, and sterilized. But it's really hard to imagine that such things happen in Sweden. Sweden certainly appears to be a highly civilized country. Could it be that in every imaginable respect, it's a highly civilized country, except for these isolated, totally atypical acts of barbarism? Or is it just possible there's a higher ethical principle operating here that we can see only if we probe beneath the surface?

The sad fact is that there are women in this world who are mentally incompetent (either severely retarded or mentally ill), and who are also fertile. They present a serious ethical dilemma. It's easy to condemn Sweden's actions, but it's not so easy to find alternatives that are demonstrably better.

There's a very real danger that if such women aren't sterilized, they'll get pregnant, because history has shown that there are plenty of unscrupulous men ready to take advantage of them. In

mental institutions, women are sometimes impregnated ("raped" would probably be more accurate) by attendants, guards, or janitors. Then, the child is taken away from the mother (is this a good thing?) and given up for adoption. In the past, in most cases, the adoptive parents weren't informed if the biological mother was a schizophrenic who had been raped by an employee of the institution (is this fair to the adopting parents?). Most of the children born of such unions will be alright, but as a group, they are far more likely to develop psychopathologies of various sorts.

We really don't know all the details about what happened in Sweden and the other European countries mentioned in the article. I'm not arguing that these programs were flawless. I'm just saying that the issues involved are difficult and complicated. An article that reports that "thousands were sterilized without their consent" could be very misleading.

And what precisely does this phrase "without their consent" mean when talking about mentally incompetent people? By definition, mentally incompetent people cannot make decisions on their own. So what if they did give their consent? What would such consent mean, if they don't understand what they're consenting to? Maybe, just maybe, the authorities in Sweden realized they'd have to decide for the women--they didn't bother to ask their permission, because they knew that to do so would be meaningless. I suppose one could try to explain to the women how babies are made, and why it might be better if they didn't have one, and then say "So, do we have your permission to be sterilized now?" But the whole thing could only be a charade as long as they didn't fully comprehend what was being said.

Pregnancy and childbirth, in and of themselves, are not terrific experiences!! They involve nausea, depression, mood swings, bladder problems, severe discomfort towards the end (just from being so fat), and hemorrhoids, to say nothing of the pain. This is self-evident to the women who have undergone it. To attempt to prove it seem kind of silly, but I suppose we could do a survey asking a random sample of women with children, How much fun was your last pregnancy and birth, on a scale of 1 to 10? Few women would argue that pregnancy and childbirth are fun. Surrogate mothers are paid considerable sums to undergo it for infertile couples, presumably because there aren't lots of women volunteering to do it for free. So I think it's a safe assumption pregnancy and childbirth are not inherently highly-rewarding experiences, except perhaps as they are a part of the process of producing a child to love.

They're something to be endured as a means to an end. But if a woman goes through 9 months of it, has a baby, and then is told, "Sorry, we have to take your baby away from you for its own protection," and the mother never sees her baby again, this is a very sad story!! It's a wrenching experience, and it is arguably far worse than having a simple operation to prevent pregnancy in the first place, one which many thousands of women opt for every year when they don't want more children.

Lets be clear about this. By sterilizing mentally incompetent women, were not depriving them

of the experience of MOTHERHOOD -- they are already denied that by the fact that they would be totally unfit mothers. Rather, were depriving them of the dubious privilege of PREGNANCY and CHILDBIRTH, which, as the majority of women would attest, is doing them a favor. In addition, were sparing them the profoundly painful experience of having their baby taken away from them at birth, never to be seen again.

So we have 2 choices here: either these women can be sterilized, or they risk having children for whom they cannot care, who will be forcibly taken from them, without their consent!! The children will also have a substantially increased chance of developing mental problems. I believe the former is the more humane, and the more ethical, all things considered. (The fertility of mentally incompetent men is not as big a problem because severely retarded or insane men generally have a very hard time finding women to have sex with.)

It looks like we are going to HAVE to FORCE them to do something -- either to be sterilized, or to take their babies away from them at birth. Either that, or the babies can be brought up in an insane asylum. I think the former is much more kind. There's no getting around this choice, pretending it doesn't exist. What do you think?

The question remains, who will make this decision? Since the government seems to screw up nearly everything it gets its hands on, the decision should be made by the parents or closest relative. If there is none, perhaps by the institution. This needs to be worked out.

Society can and does make decisions for mentally incompetent people all the time--for example, to institutionalize them. To allow them total "freedom" means to abandon them. It means allowing them to wander the streets mumbling to themselves, hovering in doorways, easy prey for criminals, and likely doing harm to themselves or others. In my opinion, it's in their best interest, and in the best interest of any future children they may bear, and society at large, if these people do not procreate.

5. Everyone knows that IQ tests are biased--what makes you think they're not biased?

Here's an example of real bias: Say an IQ test is standardized in England, and in the vocabulary section there are words like "lift" [as a noun] and "lorry" and "scones." If this same test is given to American kids, these items would stand out rather conspicuously. When you looked at the data, you would recognize immediately that: 1. answers to these questions were merely random guesses, 2. kids who scored high on the test as a whole wouldn't be any more likely to get them right than those who scored low, and 3. older kids wouldn't do any better than younger kids. (We'll assume, for the sake of simplicity, that their exposure to these words is uniformly zero.) This means they're worthless questions, with no predictive value, for the American kids, because all they do is add "noise," thereby reducing the reliability and validity of the test. Furthermore, if nobody ever bothered to look at the data and delete these items from the American version, these items could legitimately be said to be "biased" against American kids.

By analyzing the data, it's possible to determine definitively whether a test is, or is not, biased against any group, or whether particular items are biased. (It gets much more complicated, but this is a kind of "Bias-Made-Simple" explanation.) Also, there's the important question of whether the test predicts success equally well for all groups. If a test doesn't satisfy the criteria for bias, it's not biased. People's feelings, and what may appear on the surface to be bias, have nothing to do with making this determination.

In Arthur Jensen's definitive work on the subject, *Bias in Mental Testing*, he found that IQ tests are not biased (using statistical criteria), except that the tiny unreliability of the tests slightly favors low-scoring groups. Also, it's hard to imagine how the argument of bias towards Caucasians could be refuted any more effectively than by the fact that Japanese kids do better (on average) than American kids.

6. What you're advocating is the kind of thing David Duke would endorse!

It's a pathetic commentary on freedom of speech in this country, but given the current political climate, only brave people with a large degree of independence can speak unpopular truths that go against political correctness. Why? Because people can and do lose their jobs. Remember "Jimmy the Greek?" He made some comment about blacks that wasn't even derogatory, but he was immediately fired, and never seen or heard from since. The whole country witnesses these events, and we're all cowed by them. It's kind of like Fascism, or Communism, only the censorship was created from within, and there are no laws on the books. We need to understand better what is fueling this insanity. At any rate, if David Duke knows the facts, and he's smart enough and brave enough to endorse eugenics, then great, he's to be commended for it.

7. Wouldn't it be impossible to make a serious dent in the incidence of recessive metabolic disorders through eugenics?

Yes, that's a good point. Most children born with them come from parents who didn't know they were carriers. If everyone who actually had the disorder didn't have children, it still wouldn't make much difference. But nowadays, there are many powerful new ways to deal with these problems. Parents can be tested to see if they're carriers, and if a fetus is affected, they have the option to abort. Or, they could have in vitro fertilization, and implant only the fertilized egg that was not affected. These procedures are part of contemporary eugenics, which really has many more options than early eugenics had.

8. There are good reasons to reject eugenics, even if it's scientifically valid. One is that the world is not ready to handle this research. It's true the media have a kind of filter that is heavily biased in favor of equality, so pro-eugenics views are hardly ever heard. However, there's a reason this filter exists: it's more important for the majority of people to have a good life than it is for them to consider dangerous or volatile ideas.

Ah, now you've hit on something! You very aptly describe the suppression of these ideas as a "filter." I agree absolutely that this belief--that the public should be protected from radical ideas, particularly ones the media themselves find distasteful-- is a major reason journalists and others have lied to the public about IQ. But as reasons go, this one is not nearly good enough!! Don't journalists have an ethical obligation to report the facts? Snyderman and Rothman showed that in this debate, the ultra-liberal media have actually kept expert opinion from the public.

While mentally incompetent people must have decisions made for them by others (because, by definition, they're incapable of making rational choices), the public can hardly be considered mentally incompetent. Are you suggesting that the public is too stupid and too unstable to be trusted with the truth? This is precisely the reason why many in the anti-eugenics camp distort or suppress the truth about IQ. Also, what a handy rationalization for journalists and others who are simply too cowardly to express an unpopular truth! They don't even have to admit it to themselves. Instead, they can congratulate themselves on being "real humanitarians."

To me, the attitude you express conveys a chilling arrogance, and utter contempt for the humanity of the public. It indicates they (you?) don't value truth, or freedom, very much. Because you "care" about them, you want to decide what's best for them to believe?! Would you want people to "care" about you that way? Who are you--who is anyone-- to decide what truths the masses can, and cannot, be told? Do you believe in freedom of speech? Or is it only for certain people?

9. Maybe there are valid reasons why many people are ignorant about sociobiology and eugenics--ie, because they are scared of their implications.

I think you're right. But wouldn't it be much better to know exactly what the facts are, and then start worrying? Maybe it's not as bad as we fear. Has it ever been a good strategy to stick our heads in the sand, like an ostrich? And really, the facts are basically the same things people have always believed in since the beginning of time. Now science has confirmed what common sense told people for millennia, so there's no reason to think these beliefs will somehow bring about the end of the world. The idea that everyone is born exactly equal on everything that matters is totally new. Before Marx and Freud, it would have been laughed at, and it will be laughed at in the future, because an illusion--especially one this blatantly obvious--can't sustain itself indefinitely.

10. There are many admirable human qualities that aren't measured by IQ tests. There will never be consensus on what all of those qualities are. What gives any of us the right to decide which ones to phase out?

I believe there's already a consensus on the fundamental traits we value--for example, what traits would you want to see in your children? Most people would say they want their children

to be healthy, intelligent, sane, law-abiding (not criminals) and conscientious--meaning possessing good character (honest, hard-working, concerned for well-being of others). Have any parents, anywhere, ever said, "We're hoping our son will grow up to be a psychopath?" These values would be the same 100 years ago, and 1000 years ago.

Another way this consensus is expressed is in governmental expenditures on hospitals, research on diseases and mental illness, prisons, police, etc. We as a society are already very clearly trying to change people, using environmental engineering in a not-very-effective attempt to make people smart, law-abiding, sane, and healthy. Why not do something that actually works?

A "right" implies there's something in it for us, when in reality, there's nothing in it for us. I believe that we have a responsibility to future generations, a moral obligation, to help them, just as we want to make sure they have clean air and water, and a sound economy. We already agree on what is good, and what is not. There's absolutely no doubt about it--we are quite sure that we wouldn't want to be diseased, retarded, a criminal, or insane--so it's no great leap of faith to assume people of the future don't want that, either!

11. What you say may be true, but still, you frighten me!

I realize eugenics upsets many people, and I'm sorry. I know from long experience that besides frightening people, it also makes them extremely angry, believe me! I wish I could say what is true without upsetting people, but I can't. The reason I have devoted myself to eugenics is because I believe there's an enormous amount to be gained from it, and that eugenics can bring about a vast increase in happiness and well-being. But in the short term, just mentioning the word upsets people--there's no doubt about it.

I'm not unsympathetic to people who are horrified at the thought of eugenics, because they think it's some form of cruelty, and cruelty in any form is something I personally abhor. The two traits I value most highly are honesty and kindness. I believe passionately in eugenics because I see it as the most immense kindness. People who think of eugenics as some form of cruelty wrongly associate it with the Nazi's. This is an unfair association, since 28 other countries had eugenics legislation, but did not commit genocide, or anything like it.

12. What is intelligence?

One simple, straightforward definition is that intelligence is problem-solving ability. There are other ways to define it. Egalitarians may object, "Since we can't all agree on a definition, it's a useless concept." Not true! Intelligence is like heat. We know the difference between hot and cold, and we can measure fine gradations of heat. But, they may ask, what is heat, really? It's molecules rushing about. OK, but what is that really? Some people say, "It's too hot in here!" while others will say, "It's too cold!" Does this mean we must discard the concept of heat? No. Almost any definition of any word could give rise to disagreement. We don't have unanimity on

definitions of many important constructs which we use every day, but we carry on nevertheless, and we are much better off with them, than without them.

Egalitarians also love to say, "But IQ isn't everything!" That's true. (Is there anything which is everything?) But IQ clearly is something very, very important. Prediction is the gold standard in science. Those who pooh-pooh it have a difficult time (or maybe I should say "an impossible task") explaining why IQ is the single best predictor of success in life. How could anything which measures nothing--or even something trivial--predict success so well?

13. It seems like there's a total "disconnect" on this issue between science on the one hand, and popular opinion, on the other.

You're absolutely right. There are 2 arenas in which the Nature-Nurture debate is taking place -- the scientific one, and the public one--and the outcomes are exactly opposite. Scientifically, the egalitarian (nurture) position that heredity has no influence on behavior, that everyone is born exactly the same, and that the environment determines everything--is totally bankrupt. Proponents of this view have been not just beaten, but clobbered by overwhelming evidence--from numerous twin studies, adoption studies, and studies like the one by Charles Murray (on this website). The egalitarians have been clobbered despite the fact that the "playing field" is absurdly uneven in their favor--it is far easier to get funds for research if you take an egalitarian stance, your articles will be greeted with great interest and approval, and you won't have even one-thousandth the problem finding a publisher for your book, which will get good reviews and sell lots of copies. In spite of all that, the egalitarians have been thoroughly trounced in the scientific arena for the plain and simple reason that they're wrong.

But in the public arena, it's just the opposite. The egalitarians, with help from the liberal media, have clearly won the day. The egalitarian strategy has been all along to snipe at the research of the hereditarians. [I use "hereditarians" to mean people who believe heredity exerts a strong influence on behavior. No hereditarians I've ever heard of believe the environment is unimportant.] Egalitarians use ad hominem attacks, portraying hereditarians as hateful, bigoted villains who deliberately distort their data in order to make other people feel bad. Egalitarians have no compelling evidence, and they know it, so their best tactic is to confuse the issue: "Nobody can ever know for sure." "It hasn't been proven." "Who can say what intelligence really is?" They like to say that heredity and environment are so hopelessly entangled, how could anyone figure out the relative influence of each? [Easy--by studying identical twins reared apart.] Their obscurantist strategy is powerless against vast areas of new research (e.g., on biological correlates of IQ), so they simply ignore them. They point to small flaws in one twin study, for example, to try to invalidate it, but neglect to inform the reader that a dozen more studies found exactly the same thing. They give examples of questions taken from IQ tests, often items discarded 20 years ago, saying they're "obviously biased," as if it's sufficient to simply make the assertion and leave it at that. But do the egalitarians really want to get at the truth? Ask yourself this question, "What research have Gould, Lewontin, Rose, et al ever

produced to prove the egalitarians are correct?" Answer: None.

Among researchers in the field of IQ, it's been common knowledge for years that the leading proponents of egalitarianism are not merely mistaken or misinformed, they are thoroughly dishonest. They deliberately mislead people into accepting egalitarianism, an ideology consistent with their own political beliefs, and one which they arrogantly decided is "good for" the masses to believe. (And in so doing, they make lots of money--they must be in hog heaven.) Not only is their position true, they insist, it's the only moral stance. I ask you: doesn't this sound suspicious? Are we talking about truth here, or about religion? How can a question of fact become also a moral duty to believe? Brilliant and sincere scientists, such as Jensen, Lynn, Rushton, Herrnstein, and Murray, who consistently report the truth even though they know it's unpopular, are the evil villains in the little "morality play," while the egalitarians, of course, are the "good guys." It's ironic the way they take on pious airs while blatantly lying. The reader must surely be thinking by now, "What kind of insanity are we witnessing here?!" I'll tell you what kind--it's called temporary insanity, because the egalitarians won't be able to suppress the truth forever.

Judging from their past behavior, it wouldn't be at all unreasonable to imagine that the egalitarians would conduct studies and lie about their results--if they thought they could get away with it. But they can't, at least not for long, and here's why. If they conducted a twin study, for example, to prove that genes don't influence behavior, that IQ has no genetic component, or whatever, if they tell the truth about their results, it either won't prove much of anything (because they messed it up), or more likely, it will prove they're totally wrong. Still, they might get a little mileage out of it by interpreting their results in some convoluted way. But if they fabricate a study, and lie about their results, then they'll get into big trouble, because other scientists will attempt to replicate it, and get the opposite results. Eventually, their dishonesty will be revealed, and they will lose what piddling credibility they have left in the scientific world. (That's part of the beauty of science! It's an excellent system for uncovering the truth.) So basically, all the egalitarians are left with is sniping at the hereditarians, and droning on and on. No one can ever know for sure.

Everyone knows that if a person listens to only one side in a bitter divorce, he/she is liable to come away with a totally biased impression. (The wife's friends will say "The husband is a monster!" and the husband's friends will say "The wife's a psychopath!") But even though we know better, we still fall prey to believing what we hear based on just one side, and we do it all the time, because there are only so many hours in a day, and we can't probe deeply into every question. On the issue of genetics and behavior, the egalitarians and the liberal media have totally dominated public discourse, so for decades, only their side has been presented to the public. Is it any wonder the public accepts what they say uncritically? It's certainly not anyone's fault for believing it. If I didn't happen to be involved with IQ, I'm sure I'd believe it, too.

But then maybe someday, I might think to myself, "Why not see what the other side has to

say?" Many, many people are incapable of doing this, because they're terrified the other side might be right. Then, not only would they feel like fools ("embarrassed in front of themselves"), they'd have to re-assess many of their beliefs. Anyway, just imagine I summoned up the courage to venture into forbidden territory, and I read one really good book, such as *The Bell Curve*, by Herrnstein and Murray. I'd think to myself "Gee, what a totally different world this is! It's not a long, rambling, tendentious bunch of propaganda like Gould's *The Mismeasure of Man*--it's well-organized, clearly stated, interesting, even engrossing. Hmmm . . . kind of exciting! It's like real meat-and-potatoes here, whereas that other stuff . . . was more like . . . cotton candy. And look--all these interesting graphs and tables! I guess that's because this is, well, science." And when I'd finished, I don't think I'd feel foolish at all - I think I'd be plenty angry that I'd been lied to about genes and behavior for my whole entire life.

Race as a Biological Concept

Professor Philippe Rushton of the University of Western Ontario has released the following statement on race, in response to attempts to discredit the very concept of race and to argue that race "has no validity as a biological concept when applied to man."

Discussion of "race" shows little sign of diminishing, despite efforts to deconstruct the concept. Deconstructing the concept of race not only conflicts with people's tendency to classify and build family histories according to common descent but also ignores the work of biologists studying non-human species. Ever since 1758, when the Swedish naturalist Carolus Linnaeus created the classification system still used in biology today, most zoologists have recognized at least the four human subdivisions Linnaeus delineated: Asians, American Indians, Europeans, and Africans. (Technically, some would group the first two Linnaean subdivisions together, thus yielding three major races, often termed, mongoloids, caucasoids, and negroids.) Such high-level classifications do not rule out making finer, hierarchical subdivisions within these major groups.

A race is what zoologists term a variety or subdivision of a species. Each race (or variety) is characterized by a more or less distinct combination of inherited morphological, behavioral, physiological traits. In flowers, insects, and non-human mammals, zoologists consistently and routinely study the process of racial differentiation. Formation of a new race takes place when, over several generations, individuals in one group reproduce more frequently among themselves than they do with individuals in other groups. This process is most apparent when the individuals live in diverse geographic areas and therefore evolve unique, recognizable adaptations (such as skin color) that are advantageous in their specific environments. But differentiation also occurs under less extreme circumstances. Zoologists and evolutionists refer to such differentiated populations as races. (Within the formal taxonomic nomenclature of biology, races are termed subspecies). Zoologists have identified two or more races (subspecies) in most mammalian species.

Unless one is a religious fundamentalist and believes that man was created in the image and likeness of God, it is foolish to believe that human beings are exempt from biological classification and the laws of evolution that apply to all other life forms. Of course, individuals vary greatly within each racial group and should be treated as such. Nonetheless, much has been learned by studying the statistical differences between the various human races. In my book *Race, Evolution, and Behavior* (1995, Transaction Publishers), as well as in other recent writings (e.g., the February 1996 issue of *Current Anthropology*), I review the behavioral, morphological, and physiological differences between the three major human races -- mongoloid, caucasoid, and negroid -- and show that these statistical differences are constant across both historical time, national boundaries, and political and economic systems.

Here I will briefly summarize the findings. Asians and Africans consistently aggregate at

opposite ends, with Europeans intermediate, on a continuum that includes over 60 anatomical and social variables. These 60 variables include brain size, intelligence, sexual habits, fertility, personality, temperament, speed of maturation, and longevity. If race were an arbitrary, socially-constructed concept, devoid of all biological meaning, such consistent relationships would not exist.

Those objecting to the concept of race argue that the taxonomic definitions are arbitrary and subjective. Although critics are correct to point out that the variation within each race is extremely large, that there is disagreement as to exactly how many races there are, and that there is a blurring of category edges because of admixture, they are in error when they claim that classifications are arbitrary. For example, race-critic Jared Diamond, in the 1994 issue of Discover magazine, surveyed half a dozen geographically variable traits and formed very different races depending on which traits he picked. Classifying people using anti-malarial genes, lactose tolerance, fingerprint patterns, or skin color resulted in the Swedes of Europe being placed in the same category as the Xhosa and Fulani of Africa, the Ainu of Japan, and the Italians of Europe.

Jared Diamond's classifications, however, are arbitrary and nonsensical because they have little, if any, predictive value beyond the initial classification. More significantly, they confuse the scientific meaning of race, that is, a recognizable (or distinguishable) geographic population. In everyday life, as in evolutionary biology, a "negroid" is someone whose ancestors were born in sub-Saharan Africa, and likewise for a "caucasoid" and a "mongoloid." This definition fits with the temporal bounds offered by the best current theory of human evolution. Thus, since Homo sapiens first appeared in Africa about 200,000 years ago, branched off into Europe about 110,000 years ago, and into Asia 70,000 years after that, a "negroid" is someone whose ancestors, between 4,000 and (to accommodate recent migrations) 20 generations ago, were born in sub-Saharan Africa -- and likewise, for a caucasoid and a mongoloid.

Social definitions -- that is, self-identification and other-identification actually accord quite well with the physical evidence. Mongoloids, caucasoids, and negroids can be distinguished on the basis of obvious differences in skeletal morphology, hair and facial features, as well by blood groups and DNA fingerprints. Forensic anthropologists regularly classify skeletons of decomposed bodies by race. For example, narrow nasal passages and a short distance between eye sockets identify a caucasoid person, distinct cheekbones characterize a mongoloid person, and nasal openings shaped like an upside down heart typify a negroid person. In certain criminal investigations, the race of a perpetrator can be identified from blood, semen, and hair samples. To deny the predictive validity of race at this level is nonscientific and unrealistic.

The mean pattern of educational and economic achievement within multi-racial countries such as Canada and the United States has increasingly been found to prove valid internationally. For example, it is not often recognized, perhaps because it contradicts the politically correct theories that intelligence is purely a matter of socio-economic conditions, that Asian-Americans and

Asians in Asia often outscore white Americans and white Europeans on IQ tests and on tests of educational achievement (even though the tests were largely developed by Europeans and white Americans for use in a Euro-American culture). Blacks in the Caribbean, Britain, Canada and sub-Saharan Africa as well as in the United States have low IQ scores relative to whites. For violent crime, analyses of INTERPOL data from the 1980s and 1990s show the same international distribution that occurs within the United States (that is, Asians least, Europeans in the middle, and Africans most). A similar racial gradient is found both within the U.S. and globally for measures of sexual activity and frequencies of sexually transmitted diseases such as AIDS (based on World Health Organization data).

One neurohormonal contributor to crime and reproductive behavior is testosterone. Studies show that black college students and military veterans have 3% to 19% more testosterone than their white counterparts. The Japanese have even lower amounts than whites. Sex hormones are circulated throughout the body and are known to activate many brain-behavior systems involving aggression and reproduction. For example, around the world the rate of dizygotic twinning per 1,000 births (caused by a double ovulation), is less than 4 among Asians, 8 among Europeans, and 16 or greater among Africans. The differences in multiple birthing are known to be heritable through the race of the mother regardless of the race of the father, as found in Asian/European matings in Hawaii and European/African matings in Brazil.

Publication of *The Bell Curve* brought widespread public attention to the research on race that has been accumulating over the last 30 years in technical and specialist journals that demonstrably challenges each and every article of the dogma of biological egalitarianism. Startling, and alarming to many, is the conclusion that follows from these data that if all people were treated the same, most average race differences would not disappear. With egalitarianism under siege, there has been a major effort to get the "race genie" back in the bottle, to squeeze the previously tabooed toothpaste back into the tube, to suppress or deny the latest scientific evidence on race, genetics, and behavior.

Regardless of the extent to which the media promote "politically correct," but scientifically wrong, resolutions from professional societies such as the American Anthropological Association, facts remain facts and require appropriate scientific, not political, explanation. On average, the Chinese, Koreans, and Japanese are more similar to each other and are different from Australians, Israelis and the Swedes, who in turn are similar to each other and are different from Nigerians, Kenyans, and Jamaicans. None of this should be construed as meaning that environmental factors play no part individual development. But with each passing year and each new study, the evidence for the genetic contribution to individual and group differences becomes more firmly established than ever.

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Race, Genetics, and Human Reproductive Strategies

by J. Philippe Rushton Genetic, Social & General Psychology Monographs, Vol. 122 02-01-1996.

Abstract

The international literature on racial differences is reviewed, novel data are reported, and a distinct pattern is found. People of east Asian ancestry and people of African ancestry average at opposite ends of a continuum, with people of European ancestry averaging intermediately, albeit with much variability within each major race. The racial matrix emerges from measures taken of reproductive behavior, sex hormones, twinning rate, speed of physical maturation, personality, family stability, brain size, intelligence, law abidingness, and social organization. An evolutionary theory of human reproduction is proposed, familiar to biologists as the r-K scale of reproductive strategies. At one end of this scale are r-strategies, which emphasize high reproductive rates; at the other end are K-strategies, which emphasize high levels of parental investment. This scale is generally used to compare the life histories of widely disparate species, but here it is used to describe the immensely smaller variations among human races. It is hypothesized that, again on average, Mongoloid people are more K-selected than Caucasoids, who are more K-selected than Negroids. The r-K scale of reproductive strategies is also mapped on to human evolution. Genetic distances indicate that Africans emerged from the ancestral hominid line about 200,000 years ago, with an African/non-African split about 110,000 years ago, and a Caucasoid/Mongoloid split about 41,000 years ago. Such an ordering fits with and explains how and why the variables cluster.

DISCUSSION OF "RACE" shows little sign of diminishing, despite efforts to debunk the concept. Downgrading the idea of race, however, not only conflicts with people's tendency to classify and build histories according to putative descent but also ignores the work of biologists studying other species (Mayr, 1970). In his 1758 work, Linnaeus classified four subspecies of *Homo sapiens*: *europaeus*, *afer*, *asiaticus*, and *americanus*. Most subsequent classifications recognize at least the three major subdivisions considered in this article: Mongoloid, Caucasoid, and Negroid. This classification does not rule out making finer distinctions within these major races.

Those objecting to the idea of race call definitions arbitrary and subjective (Diamond, 1994; Lewontin, Rose, & Kamin, 1984; Yee, Fairchild, Weizmann, & Wyatt, 1993). The main empirical reasons given for negating the race concept are (a) the degree of variance within any one race, (b) the disagreement as to exactly how many races there are, and (c) the blurring of distinctions at category edges because of admixture. For example, with respect to classification, Diamond (1994) surveyed half a dozen geographically variable traits and formed very different races depending on which traits he picked. Classifying people using anti-malaria genes, lactose tolerance, fingerprint whorls, or skin color resulted in the Swedes of Europe being placed in the

same groupings as the Xhosa and Fulani of Africa, the Ainu of Japan, or the Italians of Europe.

Many of Diamond's (1994) classifications, however, make no sense because they have little, if any, predictive value beyond the initial classification. In science, the validation of constructs such as race depends on a network of predictive relationships, including item, subject, and sample aggregations. As I show in this article, the construct validity of the three major races--Mongoloid, Caucasoid, and Negroid--has been established at the behavioral level across both time and national boundaries. If race were simply arbitrary, consistent relationships of the type to be presented in this article would not be found.

A race, it should be clear, is what zoologists term a geographic variety or subdivision of a species, characterized by a more or less distinct combination of traits (morphological, behavioral, physiological) that are heritable. Zoologists have identified two or more races in many mammalian species. In humans, the three major races--Mongoloids (commonly "Asians"), Caucasoids (commonly "Whites"), and Negroids (commonly "Blacks")--can be distinguished on the basis of obvious differences in skeletal morphology, hair and facial features, and molecular genetic information. Forensic anthropologists regularly classify skeletons of decomposed bodies by race. For example, narrow nasal passages and a short distance between eye sockets mark a Caucasoid person, distinct cheekbones characterize a Mongoloid person, and nasal openings shaped like an upside down heart typify a Negroid person (Ubelaker & Scammel, 1992). In certain criminal investigations, the race of a perpetrator can be identified from blood, semen, and hair samples. To deny the predictive validity of race at this level is nonsensical.

The currently accepted view of human origins, the "African Eve" theory, posits a beginning in Africa some 200,000 years ago, an exodus through the Middle East with an African/non-African split about 110,000 years ago, and a Caucasoid/Mongoloid split about 41,000 years ago. Evolutionary selection pressures in the hot savanna, where Negroids evolved, differ from pressures in the cold Arctic, where Mongoloids evolved (Stringer & Andrews, 1988). In my book *Race, Evolution and Behavior* (1995), I proposed that the farther north the populations migrated from Africa, the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children successfully during prolonged winters. As the original "out-of-Africa" populations evolved into present-day Caucasoids and Mongoloids, they developed larger brains, slower rates of maturation, and lower levels of sex hormone, and with these changes came reductions in sexual potency, aggressiveness, and impulsivity and increases in family stability, forward planning, self-control, rule-following, and longevity.

The prevailing social science paradigms are giving way to gene-culture co-evolutionary perspectives. During the 1980s, there was an increased acceptance of behavioral genetics and evolutionary theorizing. Discoveries in medical genetics heralded what was to come with gene therapy becoming a possibility for a variety of classic psychological disorders. A renewal of

interest in human origins also characterized the 1980s, with Africa identified as the Garden of Eden. Eve was thought to be a long-armed, thick-boned, well-muscled, dark-skinned woman who lived some 200,000 years ago on the East African savanna. She appeared on the front cover of Newsweek (January 11, 1988) and served as the center of a debate on the evolution of modern humanity. However, work on racial differences in behavior, though a necessary concomitant of these revisionist viewpoints, was not included in them and constituted an embarrassment. On the topic of race, a righteous conformity has come to prevail.

Most work on racial differences has focused on Blacks and Whites in the United States, where the achievement of Whites is disproportionately higher than that of Blacks. Ever since Jensen's (1969) monograph in the Harvard Educational Review, a controversy has raged over whether the causes of this disparity involve genetic as well as environmental factors (Eysenck & Kamin, 1981; Loehlin, Lindzey, & Spuhler, 1975). Extensive surveys show that a plurality of experts believe that Jensen was correct in attributing a portion of the racial variation to genetic differences (Snyderman & Rothman, 1987). The debate was widened by data available on (a) Black samples in Africa, the Caribbean, and elsewhere (most Black people live in postcolonial Africa); (b) Asian samples in the Pacific Rim (one third of the world's population); and (c) characteristics in addition to mental ability, showing the same worldwide racial ordering in brain size, personality, speed of maturation, crime rates, family structure, and sexual behavior (see Table 1).

The central theoretical questions are as follows. First, why should Caucasoids average so consistently between Negroids and Mongoloids on so many dimensions? Second, why is there an inverse relationship between brain size and gamete production across the races? It is not simply differences in cognitive ability that require explanation. A network of evidence, such as that shown in Table 1, allows more chance of finding powerful theories than do single dimensions drawn from the set. Nonetheless, it must be emphasized at the outset that there are overlaps in most distributions. Because average differences between races are typically only between 4% and 34%, it is problematic to generalize from a group average to a particular individual.

[Image]

Maturation, Personality, and Social Organization

In the United States, Black babies have long been known to have a shorter gestation period than White babies. By week 39, 51% of Black children have been born, whereas the figure for White children is 33% (Niswander & Gordon, 1972; Polednak, 1989). Similar results have been observed in Europe, where women of European ancestry have been compared with women of African ancestry (Papiernik, Cohen, Richard, de Oca, & Feingold, 1986). Papiernik et al. (1986) reviewed other observations that, although Black babies are born earlier, they are physiologically more mature than White babies, as measured by pulmonary function and

amniotic fluid. I am unaware of data on Asian babies.

Black precocity in physical maturation continues through life. On well-standardized tests, scores indicate that Black babies from Africa, the Caribbean, and the United States mature faster on measures made from birth to 12 months in coordination and head lifting, in muscular strength and turning over, and in locomotion; at 15 to 20 months, Black babies are more advanced in the ability to put on clothing (e.g., Bayley, 1965; Freedman, 1974; but see Warren, 1972, for a critique of the early African data). In contrast, on well-standardized measures, Asian children are more delayed than White children. Asian children typically do not walk until 13 months, compared with 12 months for White children and 11 months for Black children (Freedman, 1979). Regarding dental development, African samples begin the first phase of permanent tooth eruption at age 5.8 years and finish at 7.6 years; Caucasoids begin at 6.1 years and finish at 7.7 years; and Mongoloids begin at 6.1 years and finish at 7.8 years (Rushton, 1995, p. 149, with data from Eveleth & Tanner, 1990).

Behavioral life-cycle traits show a similar set of differences among the three populations. These include age at first intercourse and age at first pregnancy, as well as longevity. For example, at all ages, Blacks have higher mortality rates from numerous causes than Whites in the United States, and the gap has widened over the last 30 years (Polednak, 1989). Asians have lower mortality rates than Whites.

With respect to personality, data show that across ages, across traits, and across methods, Blacks are more uninhibited in temperament than Whites, and Whites are more uninhibited than Asians. For infants and young children, observer ratings are the main method used, whereas for adults, the use of standardized tests is more frequent (e.g., Vernon, 1982). For example, researchers in a study carried out in French-language Quebec examined 825 4- to 6-year-olds from 66 countries. These immigrant children were rated by 50 teachers in preschool French-language-immersion classes. The French-Canadian teachers consistently reported (a) better social adjustment and less hostility/aggression for the Mongoloid children than for the Caucasoid children and (b) more social adjustment and less hostility for the Caucasoid children than for the Negroid children (Tremblay & Baillargeon, 1984).

Rushton(1985) indexed behavioral restraint by low extraversion and high neuroticism scores from the Eysenck Personality Questionnaire, using data collected from 25 countries around the world. Averaging across these samples, Rushton found 8 Mongoloid samples (N = 4,044) to be less extraverted and more neurotic than 38 Caucasoid samples (N = 19,807), who were less extraverted and more neurotic than 4 African samples (N = 1,906).

Social organization depends on following rules. Such behavior can be indexed, for example, by marital functioning, mental durability, and law abidingness. On all of these measures, the rank ordering within the United States is Asian > White > Black (Jaynes & Williams, 1989). The 1.5 million individuals of Asian descent in the United States are very rarely perceived as a "social

problem," for they have significantly fewer divorces, out-of-wedlock births, or incidences of child abuse than do Whites, and, in fact, they are very seldom studied. Black family structure, however, has been studied intensively. Since the 1965 Moynihan report documented the high rates of marital dissolution, high frequency of female heads of families, and numerous illegitimate births, the figures cited as evidence for the instability of the Black family have tripled (Jaynes & Williams).

The race/crime relationship found within the United States, with Asians being most law abiding, Africans least law abiding, and Europeans intermediate, has been found within other multiracial countries, such as Britain, Brazil, and Canada (Rushton, 1990). Moreover, the pattern has been found in China and the Pacific Rim, Europe and the Middle East, and Africa and the Caribbean. The global nature of the pattern is shown in data analyzed from INTERPOL yearbooks, showing that African and Caribbean countries had double the rate of violent crime (murder, rape, and serious assault) than did European countries, which had three times the rate of violent crime than did Asian countries (Rushton, 1990).

[Image]

Hormones and Reproductive Potency

The average woman produces one egg every 28 days in the middle of the menstrual cycle. Some women, however, have shorter cycles than others, and some produce two eggs in a cycle. Both events translate into greater fecundity because of the opportunities provided for conception. Occasionally, double ovulation results in the birth of dizygotic (two-egg) twins. The races differ in the rate at which they double ovulate. The frequency of dizygotic twins per 1,000 births is less than 4 for Mongoloids, 8 for Caucasoids, and 16 or greater for Negroids (Bulmer, 1970). Subsequent reviews of twinning rates in the United States (Allen, 1988) and Japan (Imaizumi, 1992) have confirmed these data.

Gonadotropin levels differentiate the races in the predicted direction and may underlie the difference in rates of multiple birthing. Testosterone levels may underlie other behavior traits differentiating the races, for they have been found to be 19% higher in a sample of Black U.S. college students than in their White counterparts (Ross et al., 1986). In an older group of U.S. military veterans, Blacks measured 3% higher in testosterone level than Whites (Ellis & Nyborg, 1992). Another study, of testosterone metabolites, showed a 10% to 15% higher incidence in Black Americans than in White Americans and a still lower incidence in the Japanese in Japan (Hixson, 1992).

Rushton and Bogaert (1987) reviewed the literature on frequency of sexual intercourse. For example, Hofmann (1984) examined worldwide premarital coitus rates among young people in high school and found that African adolescents were more sexually active than Europeans, who were more sexually active than Asians. The same pattern has emerged from surveys carried out

within the United States, where this pattern also holds for sexual activity after marriage. For example, Rushton and Bogaert (1987) averaged data from a representative cross-cultural review by Ford and Beach (1951) and found that Oceanic and American Indian peoples' self-reported rates of sexual intercourse per week ranged from 1 to 4, U.S. Whites' ranged from 2 to 4, and Africans' ranged from 3 to 10. Subsequent surveys support these data. For married couples in their 20s, the average frequency of intercourse per week for the Japanese and Chinese in Asia is 2.5 (Asayama, 1975; Bo & Wenxiu, 1992, Table 7), whereas for American Whites it is 4, and for American Blacks, 5 (Fisher, 1980).

Racial differences also appear on measures of sexual permissiveness, amount of thinking about sex, and sex guilt. Abramson and Imari-Marquez (1982) observed that each of three generations of Japanese Americans showed more sex guilt than matched Caucasian Americans. In studies carried out in Britain and Japan, using a sex fantasy questionnaire, Iwawaki and Wilson (1983) found that British men reported twice as many fantasies as Japanese men, and British women admitted to four times as much sex fantasy as Japanese women did. By contrast, Blacks reported not only having had intercourse with more casual partners but also with fewer feelings of distaste than did Whites.

Rushton and Bogaert (1987, 1988) examined updated data from the Kinsey Institute for Sex Research (Gebhard & Johnson, 1979) that eliminated sources with known sexual bias, such as prostitutes. Black/White differences were compared on 41 variables. For men and women, college-educated Whites were found to be most sexually restrained, college-educated Blacks least, and non-college-educated Whites intermediate. This pattern was found for early onset of premarital, marital, and extramarital sexual experience; number of sexual partners; and frequency of intercourse. For women, the races were also differentiated on speed of onset and incidence of pregnancy, short duration of the menstrual cycle, and number of orgasms per act of coitus (see Table 2).

[Image]

Cognitive Abilities

The literature on the global distribution of intelligence test scores was reviewed by Lynn (1991). Mongoloid populations, measured in North America and the Pacific Rim, had average IQs in the 101 to 111 range. Caucasoid populations in North America, Europe, and Australasia had average IQs ranging from 85 to 115, with an overall mean of about 100. Negroid populations living south of the Sahara, in North America, in the Caribbean, and in Britain had average IQs in the 70 to 90 range. Lynn's (1991) estimate of 70 for the IQ of African Blacks has been confirmed in two subsequent studies. In one study, the Wechsler Test was administered to a representative sample of children in Zimbabwe (Zindi, 1994), and in the other study, researchers examined Ethiopian immigrants to Israel (Lynn, 1994). In both studies, the IQs of the Africans were found to be just under 70.

Questions remain about the validity of using tests for racial comparisons. However, because the tests show similar patterns of internal item consistency and predictive validity for all groups, and the same differences are found on relatively culture-free tests, many psychometricians think that the test scores are valid measures of racial differences (Herrnstein & Murray, 1994; Snyderman & Rothman, 1987). Also, novel data about speed of decision making (reaction time) show the same racial pattern as do test scores. Investigations have been done with 9- to 12-year-olds from six countries. In these studies, the children had to decide which of several lights was on or stood out from others, and then they had to move a hand to press a button. All children can perform the tasks in less than one second, but children with higher IQ scores perform these elementary tasks faster than do those with lower scores. Lynn (1991) found that representative Asian schoolchildren from Hong Kong and Japan were faster in reaction time than were similar White children from Britain and Ireland, who, in turn, were faster than were similar Black children from South Africa (see also Lynn & Shigehisa, 1991). Using the same decision-time tasks, as well as those involving retrieval of well-learned facts from long-term memory, researchers also found this same three-way pattern of racial differences in California samples (Jensen, 1993; Jensen & Whang, 1993, 1994).

[Image]

Brain Size

A small but robust relation has been firmly established between cognitive ability measured by both educational attainment and IQ tests and brain size. The correlation between test scores and brain size (estimated from magnetic resonance imaging [MRI], which, in effect, constructs a three-dimensional picture of the brain in vivo), averages at about .40 (Andreasen et al., 1993; Egan et al., 1994; Raz et al., 1993; Wickett, Vernon, & Lee, 1994; Wilierman, Schultz, Rutledge, & Bigler, 1991). The MRI measure of brain size, more accurate than previous methods used, results in a substantial increment over correlations of about .20 between head perimeter and measures of intelligence, reported since the turn of the century (Broman, Nichols, Shaughnessy, & Kennedy, 1987; Galton, 1888; Wickett et al., 1994). The head perimeter/IQ relation has been found within samples of Asians as well as Whites (Rushton, 1992b). Jensen and Johnson (1994) found that head size is significantly correlated with IQ within families (i.e., among same-sex full siblings, with age partialled out), thus indicating a functional relation between brain size and IQ.

Although racial differences in brain size were widely believed to exist by researchers in the 19th and early 20th centuries, more recent researchers suggested that differences disappear when corrections are made for body size and other variables (Gould, 1981). Modern studies (described below), however, have confirmed the earlier findings. Three main procedures have been used: weighing wet brains after death, filling empty skulls with lead shot and then measuring the volume of filler, and converting external head sizes into cranial volume. Data

from all three sources converge on the conclusion that, after statistical corrections are made for body size, Mongoloids average about 17 cm³ (1 cubic inch) more than Caucasoids, who average about 80 cm³ (5 cubic inches) more than Negroids.

For brain weight at autopsy, Ho, Roessmann, Straumfjord, and Monroe (1980a, 1980b) provided original data for 1,261 adults 25 to 80 years old from Cleveland, Ohio. Ho et al. excluded those brains that were obviously damaged, and they measured all brains using well-standardized procedures. Sex-combined differences were found between 811 Whites (1,323 g, SD = 146) and 450 Blacks (1,223 g, SD = 144). These sex-combined differences remained significant after controlling for age, stature, weight, and body surface area. In the introduction to their article, Ho et al. (1980a) briefly reviewed studies from Japan and Korea, which Rushton (1988) averaged to find a sex-combined brain weight of 1,351 g, higher than that of Caucasoids.

For endocranial volume, an international database of up to 20,000 skulls for 122 ethnic groups was computerized and classified by climate and region by Beals, Smith, and Dodd (1984). A 2.5-cm³ increase in brain volume was found with each degree of latitude. Geographic differences emerged. Table 2 in Beals et al. (1984, p. 306) contains data that show that sex-combined cranial capacity from 26 Asian populations averaged 1,380 cm³ (SD = 83), from 10 European groups = 1,362 cm³ (SD = 35), and from 10 African groups = 1,276 cm³ (SD = 84). When Beals et al. (1984, Table 5) identified continental areas in relation to the presence or absence of winter frost, the geographic differences became even more pronounced (19 Asian groups = 1,415 cm³, SD = 51, 10 European groups = 1,362 cm³, SD = 35; 9 African groups = 1,268 cm³, SD = 85).

As to external head measurements, several studies have been conducted, and evidence has been found (including measurements from a data set compiled by Hershkovits, 1930) of a Mongoloid advantage, which is often cited as showing an absence of racial differences. Yet the data actually show (Rushton, 1993) that for 5 male Mongoloid samples, average external head measurement equals 1,451 cm³ (SD = 22); for 9 Caucasoid samples it is 1,421 cm³ (SD = 49); and for 12 Negroid samples it is 1,295 cm³ (SD = 44). In another study, Rushton (1991) calculated cranial capacities for 24 (male only) international military samples collated by the U.S. National Aeronautics and Space Administration. After adjusting for stature, weight, and body surface area, Rushton found that cranial capacities of Mongoloids averaged 1,460 cm³ and of Caucasoids 1,446 cm³. For a stratified random sample of 6,325 U.S. Army personnel measured in 1988 for fitting helmets, Rushton (1992a) found that, after adjusting for stature, weight, sex, and rank, 543 Asian Americans averaged 1,416 cm³ (SD = 104), 2,871 European Americans averaged 1,380 cm³ (SD = 92), and 1,387 African Americans averaged 1,359 cm³ (SD = 95). Finally, Rushton (1994) examined 40 samples compiled in 1990 by the International Labour Office in Geneva from tens of thousands of men and women 25 to 45 years old. After adjusting for the effects of stature and sex, 6 east Asian groups = 1,308 cm³ (SD = 37), 18 European groups = 1,297 cm³ (SD = 38), and 4 African groups = 1,241 cm³ (SD = 38).

After converting adult sex-combined brain weight data from grams to the equivalent in cm³ (1 cm³ = 1.036 g) and averaging across all the studies, Rushton (1995) found that, in brain size, Mongoloids = 1,364 cm³, Caucasoids = 1,347 cm³, and Negroids = 1,267 cm³. Differences due to method of estimation within a race are smaller than differences between the races. Overall, Rushton (1995) calculated a world average brain size of 1,326 cm³; Beals et al. (1984) calculated it at 1,349 cm³.

Racial differences in brain size and IQ are revealed early in life. Data collapsed across social class from the National Collaborative Perinatal Project show that, of the sample studied, the 19,000 Black infants had smaller head perimeters at birth, were shorter in stature, were lighter in weight, and had an earlier age of gestation than the 17,000 White infants (Broman et al., 1987). By 7 years of age, catch-up growth favored the Black children in body size but not in head perimeter. Head perimeter at birth correlated with IQ at age 7 years from .10 to .20 for both the Black and the White children.

Additional analyses show that Black/White differences in brain size are correlated with Black/White differences in mental ability. In a sample of adolescents, Jensen (1994) found that the greater the differences between White and Black children on 17 cognitive tests, the higher were the correlations of the test scores with head size, $r = .533$, $p < .05$; with unreliability of measurement controlled, $r = 0.715$, $p < .01$. In a study of 14,000 4- and 7-year-olds, the White and Black samples differed by about 1 standard deviation in IQ, and they differed significantly ($p < .001$) in head size (White > Black), even with age, height, and weight statistically controlled (Jensen & Johnson, 1994). It is noteworthy that there was no difference in average head size between White and Black children who were matched on IQ scores (and on age, height, and weight).

[Image]

Heritability of Racial Differences

Theories of racial differences based on 100% cultural transmission have formidable problems accounting for the physiological traits such as speed of dental and physical maturation, brain size, gamete production, and testosterone production as well as the data on within-race heritability and the consistency of the racial rankings across time and cultures. Direct evidence for between-group heritabilities also exists. For example, the racial differences in multiple birthing are independently heritable through the race of the mother and not through the race of the father, as found in Mongoloid-Caucasoid crosses in Hawaii and Caucasoid-Negroid crosses in Brazil (Bulmer, 1970).

Because higher heritabilities are stronger indicators of underlying genetic substrates than lower heritabilities (which by definition imply environmental influence), the heritabilities can

themselves be used to test theories. If genes are important, then racial differences should be most pronounced on tests with high heritabilities. Jensen (1973, chapter 4) found that Blacks and Whites were indeed most differentiated on genetically influenced tests and least differentiated on environmentally influenced tests. In one study of 543 pairs of siblings, Jensen (1973) found a .67 correlation between the heritability of 13 tests and the magnitude of the Black/White difference. Subsequently, Black/White differences were found to be most pronounced on more g-loaded tests, that is, the general factor common to diverse cognitive tests (Jensen, 1985). The g loadings, the purest measures of cognitive ability, are related to a number of biological variables, including brain-evoked potentials, heritability coefficients determined from twin studies, and the degree to which children's test scores are depressed by inbreeding and raised by out breeding (Jensen, 1987).

Building on Jensen's work, Rushton(1989) carried out a study using as genetic weights the amount of inbreeding depression found on 11 tests from the Wechsler Intelligence Scale for Children. Inbreeding depression occurs when harmful recessive genes combine, an event more likely in offspring of closely related parents. Estimates of inbreeding depression had been calculated from 1,854 cousin marriages in Japan by Schull and Neel (1965) and shown to be related to the g factor by Jensen (1983). As the g loadings (data from Jensen, 1985) and inbreeding depression scores (data from Rushton, 1989) increase, the magnitude of the Black/White difference in scores on the same 11 Wechsler tests becomes larger (see Figure 1). The inbreeding prediction was sufficiently strong to overcome generalization from the Japanese in Japan to Blacks and Whites in the United States and so constituted a conservative test of the genetic hypothesis. There really is no explanation for the inbreeding effect and its ability to predict Black/White differences in scores on IQ tests other than a genetic one.

Transracial adoption studies also reveal genetic influence. There have been at least three studies of Korean and Vietnamese children adopted into White American and White Belgian homes (Clark & Hanisee, 1982; Frydman & Lynn, 1989; Winick, Meyer, & Harris, 1975). As babies, many of these children had been hospitalized for malnutrition. Nonetheless, they excelled in academic ability with IQs 10 or more points higher than national norms. In contrast, Weinberg, Scarr, and Waldman (1992) found that at age 17, Black and mixed-race children adopted into White middle-class families performed at a lower level than the White siblings with whom they were raised. Adopted White children had an average IQ of 106, an aptitude based on national norms at the 59th percentile, and a class rank at the 54th percentile; mixed-race children had an average IQ of 99, an aptitude at the 53rd percentile, and a class rank at the 40th percentile; and Black children had an average IQ of 89, an aptitude at the 42nd percentile, and a class rank at the 36th percentile.

Moderate to high heritabilities are well established for numerous traits from adoption, twin, and family studies. Noteworthy are the 80% heritabilities for IQ test scores found in adult twins reared apart (Bouchard, Lykken, McGue, Segal, & Tellegen, 1990). Inherited genetic influence on mental ability has also been found among non-Whites, including African Americans,

Chinese Americans, and the Japanese in Japan. Additional genetic research has built a strong case for heritable factors in personality, psychopathology, violent crime, and other social variables (Plomin, Owen, & McGuffin, 1994). Standard inductive reasoning requires that these high within-group heritabilities be generalized to the differences between groups in the same way that environmental factors are. If poor nutrition has an effect within Whites and Blacks, then it is likely to have an effect between Whites and Blacks. As we have seen, the evidence indicates that genetic effects also operate on the between-group differences.

[Image]

Life-History Theory

The explanation proposed for the pattern of international evidence summarized in Table 1 lies in primate life-history theory. A life-history is a genetically organized suite of characters that evolved in a coordinated manner so as to allocate energy to survival, growth, and reproduction. One influential life-history theory is that of r-K selection, proposed by E. O. Wilson (MacArthur & Wilson, 1967; Pianka, 1970; Wilson, 1975). At one extreme are r-strategies, emphasizing gamete production, mating behavior, and high reproductive rates, and at the other extreme are K-strategies, emphasizing high levels of parental care, resource acquisition, kin provisioning, and social complexity. As Johanson and Edey (1981, p. 326) succinctly summarized: "More brains, fewer eggs, more 'K'." Table 3 contains a summary of the traits thought to covary with r-K reproductive strategics. Each individual, subspecies, and species has evolved a characteristic life cycle adapted to the particular ecological problems encountered by its ancestors (Wilson, 1975).

Species are, of course, only relatively r and K. Thus rabbits are K-strategists compared with fish but r-strategists compared with primates. Primates are all relatively K-strategists, and humans may be the most K of all. The life phases and gestation times of primates display a natural scale of prolongation ranging from lemur, to macaque, to gibbon, to chimp, to early humans, to modern humans with a consistent trend toward K (Lovejoy, 1981; Schultz, 1960). Note the proportionality of the indicated phases in Figure 2. With each step in the natural scale, populations devote a greater proportion of their reproductive energy to subadult care, with increased investment in the survival of offspring. The postreproductive phase of life is restricted to humans.

Dental development (which I related to racial differences earlier in this article) is a maturation variable that accurately reflects primate life-histories. Smith (1989) correlated the age at eruption of first molar with life-history factors. First molars are the earliest permanent teeth to erupt in primates and are stable in many aspects of their growth. Smith found that, across 21 primate species, age at eruption of first molar correlated .89, .85, .93, .82, .86, and .85 with the body weight, length of gestation, age at weaning, birth interval, sexual maturity, and life span. The highest correlation was .98 with brain size. She interpreted her data in terms of the r-K life-

history model.

Brain size is the key factor acting as the biological constant determining the rank order of many cross-species variables, including the number of individuals comprising the group cohesively maintained through time (Dunbar, 1992), speed of maturation, degree of infant dependency, and longevity (Harvey & Krebs, 1990; Holman, 1993). The hominid brain has tripled in size over the last 4 million years. Australopithecenes' brain averaged about 500 cm³, the size of a chimpanzee's. *Homo habilis*' brain averaged about 800 cm³, *Homo erectus*' brain about 1,000 cm³, and modern *Homo sapiens*' brain about 1,350 cm³. If the encephalization quotient, the expected brain ratio given a certain body size, is plotted over the same evolutionary time frame, the increase is proportionately less, although still substantial. On the most recent calculations, the figures go from 2.4 to 5.8 (McHenry, 1992).

Metabolically the brain is an expensive organ. Representing only 2% of body mass, the brain uses about 5% of the body's basal metabolic rate in rats, cats, and dogs, about 10% in rhesus monkeys and other primates, and about 20% in human beings (Armstrong, 1990). Across primates, large brains are also expensive in life-history tradeoffs, requiring a more stable environment, a longer gestation, a slower rate of maturation, a higher offspring survival rate, a lower reproductive output, and a longer life (Harvey & Krebs, 1990). Unless large brains substantially contributed to fitness, therefore, they would not have evolved.

A comparison of the pattern of racial differences summarized in Table I with the attributes listed in Table 3 suggests that Mongoloids are more K-selected than Caucasoids, who in turn are more K-selected than Negroids.

[Image]

Out of Africa

Knowledge about racial differences in reproductive strategies may help in choosing between alternative theories of racial origins. Africa, as Darwin surmised, is "the cradle of mankind," with *Australopithecus*, *Homo habilis*, and *Homo erectus* all making their first appearance there. However, two very different theories are currently competing to explain how racial differences evolved during the final stages of hominid evolution. These are the single-origin and the multiregion-origin theories (see Figure 3).

Both models assume that, between 1 million and 2 million years ago, *Homo erectus* emerged out of Africa to populate Eurasia. The models are divided on whether the descendants of these *erectus* populations (the Neanderthals in Europe, Beijing Man in China, and Java Man in Indonesia) gave rise to modern ancestors, or whether the *erectus* groups were evolutionary dead ends supplanted by a wave of anatomically modern people arising in Africa less than 200,000 years ago.

The single-origin, or "African Eve," theory proposes that fully modern human beings emerged recently, about 200,000 years ago, from a primeval African population. After a dispersal event in the Middle East about 100,000 years ago, they migrated into all corners of the world. In the process, specific racial features developed, and existing Neanderthal and *Homo erectus* populations were replaced. A strong version of this theory holds that no genetic mixture took place between the modern and the older populations, and that after the African/non-African split about 100,000 years ago, a Caucasoid/Mongoloid split occurred about 40,000 years ago (Nei & Roychoudhury, 1993; Stringer & Andrews, 1988).

The multiregion-origin theory holds that, over a 1-million-year period, modern races evolved in parallel in Africa, Europe, and Asia through intermediate stages from *Homo erectus*. Thus, Europeans evolved from Neanderthals, Chinese from Beijing Man, and Australian Aborigines from Java Man. Unique morphological features are seen to persist from the archaic populations to modern ones, including (a) the prominent noses of modern Europeans and those of Neanderthals (200,000 to 35,000 years ago), (b) the flat faces and shovel shaped incisor teeth of modern Chinese and those of Beijing Man and the Zhoukoudian fossils (500,000 to 200,000 years ago), and (c) the continuous brow ridge of modern aboriginal Australians and those of Java Man and the Ngandong fossils (700,000 to 100,000 years ago). Necessary to this view, much gene transfer must have occurred among the various groups to keep them evolving in concert (indicated by arrows in Figure 3).

Although it is not crucial for the r-K thesis which of the two (or other) approaches turns out to be correct, the single-origin model provides a more parsimonious explanation for why Caucasoids average so consistently between Mongoloids and Negroids. The racial-geographic succession fits with and explains how and why the variables cluster. No consistent pattern of character appearance is expected from multiregional models based on long periods of separation with unknown amounts of gene flow. Because of the closeness of the separation times, the single-origin model also explains why heritabilities are predictive across races.

A multiregional model was once proposed to explain racial differences. Coon (1962) postulated a separate but parallel evolution for several subspecies of *Homo erectus* occurring simultaneously in various regions of the world over about 1 million years. He proposed that each of these subspecies crossed the critical threshold to sapient status at different times. To account for observed differences in cranial capacities (see also Coon, 1982), he suggested that African populations "lagged behind" the other races. His theory has been rejected by other multiregionalists, who now hypothesize much gene flow between the subspecies to keep them evolving in parallel (Fruyer, Wolpoff, Thorne, Smith, & Pope, 1993). In fact, both the behavioral-genetic and molecular-genetic data suggest that substantially more relatedness exists among human populations than is likely from either Coon's (1962) model or from the modern alternatives. The generalizability of the heritabilities (e.g., Figure 1) shows that the variegated cognitive structures of the populations are extremely similar.

[Image]

Challenges and Rejoinders

Some critics have charged that the data I have presented on racial group differences (Table 1) were misleadingly selected and, by implication, that if a more representative sampling of the literature had been carried out, the null hypothesis would have been supported (e.g., Cain & Vanderwolf, 1990; Fairchild, 1991). However, if the racial differences were truly randomly distributed around a mean of zero difference, then these critics should have been able to point to just as much evidence occurring in the opposite pattern. This they have been unable to do.

The principle of aggregation, a major methodological point, must be kept firmly in mind when discussing racial differences. This principle states that the sum of a set of multiple measurements is a more stable and unbiased estimator than any single measurement from the set. One reason for this principle is that there is always error associated with measurement, and combining several measurements allows the errors to average out, thereby providing a more accurate picture of relationships in the population (Rushton, Brainerd, & Pressley, 1983). Critics can always deconstruct a data set to identify particular elements not conforming to the general pattern and then conclude that the general pattern does not exist. This logical fallacy is akin to finding that some women are taller than some men and so denying that men are, on average, taller than women.

I have applied the aggregation technique to several published data sets purporting to show racial rank orders contrary to those depicted by me (Rushton, 1995). With respect to brain size, Zuckerman and Brody (1988) showed that one sample of Black Americans had a larger cranial capacity than one sample of Nordic Swedes; Cain and Vanderwolf (1990) showed that one 1986 Negroid series had a larger cranial capacity than one 1923 Caucasoid series; and Groves (1991) showed that one sample of African Xhosa had the second largest cranial capacity of 61 different populations. However, when these data sets were aggregated, I found each time that the Mongoloid-Caucasoid-Negroid average ordering held. For example, using the cranial capacity data given by Groves (1991), the sex-combined averages for Mongoloids, Caucasoids, and Negroids are, respectively, 1406, 1385, and 1331 cm³.

For crime figures, it can be shown that on some self-report measures the racial differences become minimal or even nonexistent. But when the frequency of offending or more serious offending is taken into consideration, the expected racial differences re-emerge (e.g., Wilson & Herrnstein, 1985). Crime differences are also shown to vary enormously from offense to offense, from geographic area to geographic area, and from decade to decade (Roberts & Gabor, 1990), but again, when the figures are aggregated, the typical racial differences emerge. Critics are unable to explain why aggregation results in predictable patterns.

Another error that critics make is to focus on highly salient minor points and so obscure the larger picture. Thus, concerning reproductive behavior, Weizmann, Wiener, Wiesenthal, and Ziegler, (1990, p. 8; 1991) ridiculed references to the ethnographic record (e.g., French Army Surgeon, 1898/1972), calling it "anthroporn" because it contained "a recipe for do-it-yourself penis enlargement employing an eggplant and hot peppers." They thereby sidestepped my global review of sexual behavior and AIDS.

Although extreme environmentalists used to suggest that within-race heritabilities might be set at zero (e.g., Kamin, 1974), this position is no longer credible. Instead, it is now argued that because genetic by environment interactions are so ubiquitous, it is impossible to disentangle causality and apportion variance (e.g., Lerner, 1992). Bouchard (1984) replied to this general point by referring to the Minnesota study of monozygotic twins reared apart. Bouchard asked: If context and interaction effects are so important, how can it be that siblings raised apart grow to be significantly similar to each other, with their degree of similarity being predicted by the number of genes they share? The presence of genetically based stabilizing systems that drive development into common channels is clearly implicated.

One critique of my application of r-K theory to human populations is that I get wrong the climatic conditions most likely to produce K-selection (Anderson, 1991; Weizmann et al., 1990, 1991). Some have followed Barash (1982) and assumed that K-selection is greatest in the tropics, where Negroids evolved, and r-selection greatest in temperate and Arctic conditions. This premise, however, is incorrect. Predictability is the ecological necessity for K-selection, and this can occur in either a stable environment or a predictably variable one like the Arctic (Rushton & Ankney, 1993). What has apparently been misunderstood is that sub-tropical savannas, because of sudden droughts and devastating viral, bacterial, and parasitic diseases, are especially less predictable for long-lived species than are temperate and Arctic environments. Although the Arctic climate varies greatly over 1 year, it is highly predictable, though harsh, over time (Calvin, 1991).

Many researchers hold that environmental explanations are sufficient to explain racial difference. In the 1950s, a toilet-training variant of Freud's theory held that African children, not trained to control their bowels until a considerably later age than European children, developed an extraverted culture with values of sensual self-expression and a relaxed heterosexual attitude to sex. At the other end of the scale were Asians, who were toilet trained at a very early age and thereby became puritanically self-disciplined. From the 1960s through the 1980s, social learning theory dominated. This approach emphasized the importance of role models and incentives through the family, the mass media, and the educational system.

Most recently, an "environmental" r-K theory has been espoused (see Figure 4). Belsky, Steinberg, and Draper (1991, p. 647) succinctly described two diverging pathways: One is characterized, in childhood, by a stressful rearing environment and the development of insecure attachments to parents and subsequent behavior problems; in adolescence, by early pubertal

development and precocious sexuality; and in adulthood, by unstable pair bonds and limited investment in child rearing; the other is characterized by a stable and secure childhood and longer lasting marital bonds in adulthood.

Several longitudinal studies have confirmed this expected pattern of covariation (see Chisholm, 1993). These environmental variables add important perspective to my genetic polymorphism viewpoint. Some theorists have gone further, however, and insisted that the racial pattern can be explained entirely from a life-history perspective "without necessitating any underlying genetic variability" (Mealey, 1990, p. 387). However, there is no environmental factor known to cause an inverse relation between brain size and gamete production or to produce covariation across so multifarious a set of variables. Postulating some genetic variance is indispensable to explaining the consistency of the racial ordering. A mixed 50% evolutionary and 50% environmental model fits the data better than either the 100% environmental or the 100% genetic alternatives.

[Image]

Discussion

The r-K theory of racial group differences may help to explain other individual and group differences, including those of social class, law-abidingness, health, and longevity. One advantage of an evolutionary perspective is the focus it brings to underlying physiology. A person's position on the r-K dimension might be set by a hormonal switch mechanism. Reproductive strategies need to be coherent and harmonized, not with some traits going to one pole and other traits going to the opposite pole. Because hormones go everywhere in the body, they are uniquely able to exert more or less simultaneous effects and coordinate widespread development and functioning.

One simple switch mechanism to account for a person's position on the r-K dimension is level of testosterone. A model based on one proposed by Nyborg (1994) is shown in Figure 5. At the beginning of the inverted U-shaped curve, the men with the most testosterone (T5) would be farthest from the zenith of K, with intermediately androgenized men (T3) closer and men with the least testosterone (T1) closest. With increasing degrees of estrogenization (E1 to E5), women move away from optimum. Such a model can accommodate both genetic and environmental effects. The initial setting is genetically based with environmental factors then modifying and fine-tuning the system. In this model, Mongoloids are T2/E2, Caucasoids are T3/E3, and Negroids are T4/E4.

Finally, r-K theory may help to explain the "fertility paradox." Fisher (1958) asked why civilizations have declined. He showed that ruling groups fail to reproduce themselves because of low fertility, and he hypothesized a trade-off between the capacity for economic success and fertility. According to r-K theory, this trade-off may be even more profound than Fisher

realized, being related to a whole complex of characteristics partly genetic in origin. When there are abundant resources, selection pressures are off, and natural selection favors r-genotypes so that that segment of the population expands. Eventually, a saturation point is reached and, following Malthus, the population crashes. With selection pressures back on, K-genotypes are again favored. These cycles occur with rodents (Krebs, Gaines, Keller, Myers, & Tamarin, 1973), and a direct parallel is suggested with human beings. Thus, the r-K dimension may apply not only to demographic trends but, ultimately, to the very sweep of history.

In conclusion, it is time to end the relative neglect of theorizing about racial differences in behavior. International data show a distinct pattern. Asians and Africans average at opposite ends of a continuum that ranges over 60 anatomical and social variables, including brain size and testosterone. with Europeans intermediate. The pattern can be explained adequately only from a gene-based evolutionary perspective. If all people were treated the same, most racial differences would not disappear. This does not mean that environmental factors are unimportant for individual development. But, to deny or obfuscate the reality of a genetic basis for racial differences, as so many critics of the race concept have done, does not change reality.

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TABLE 1 Relative Ranking of Races on Diverse Variables

TABLE 2 Analysis of Kinsey Data on Race and Socioeconomic Status Differences in Sexual Behavior

TABLE 3 Some Life-History Differences Between r and K Strategists

[Note: see original text for graphs and diagrams] GRAPHS: FIGURE 1. Regression of Black/White differences on g loadings (Panel A) and on inbreeding depression scores (Panel B). The numbers indicate subtests from the Wechsler Intelligence Scale for Children-Revised: 1 coding, 2 arithmetic, 3 picture completion, 4 mazes, 5 picture arrangement, 6 similarities, 7 comprehension, 8 object assembly, 9 vocabulary, 10 information, 11 block design. From *Race, Evolution and Behavior* (p. 188), by J.P. Rushton, 1995, New Brunswick, NJ: Transaction. Copyright 1995 by Transaction Publishers. Reprinted by permission.

GRAPH: FIGURE 2. Progressive prolongation of life phases and gestation in primates.

DIAGRAM: FIGURE 3. Alternative models for the evolution of the human races: Multiregional and single origin.

DIAGRAM: FIGURE 4. Developmental pathways of divergent reproductive strategies. From Belsky, Steinberg, & Draper (1991, p. 651, Figure 1). Copyright 1991 by the Society for Research in Child Development. Reprinted with permission.

DIAGRAM: FIGURE 5. Sex hormone model for coordinating development across body, brain, and behavioral traits.

[Image]

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On the biological meaning of race

by Paul Grubach

In recent years a spate of books have been published which claim the concept of "race" in the human species serves no purpose. That is to say, there are obvious external physical differences between human populations, but these are only skin deep. For the most part, all mankind is, in a biological sense, virtually the same. One of the most important of these works is the very recent *GENES, PEOPLES AND LANGUAGES* by L.L. Cavalli-Sforza, a prominent population geneticist. 1 The arguments he advances are important, as they are used by those in positions of influence to deny that there are any significant genetic differences between the races. Cavalli-Sforza begins by admitting that, yes, human groups do vary strikingly in a few highly visible characteristics, such as "skin color, eye shape, hair type, body and facial form--in short, the traits that often allow us to determine a person's origin at a single glance (p.9)." He further admits that these traits are at least partly genetically determined, and that they evolved in the most recent period of human evolution as a response to the various environments that the human groups are exposed to. In his own words: "...there are clear biological differences between populations in the visual characteristics that we use to classify races (p.9)."

According to Cavalli-Sforza, these biological differences are only minor, as the remainder of mankind's genetic makeup is supposedly almost the same in all races. He states: "It is because they are external that these racial differences strike us so forcibly, and we automatically assume that differences of similar magnitude exist below the surface, in the rest of our genetic makeup. This is simply not so: the remainder of our genetic makeup hardly differ at all." 2

He advances the following arguments to bolster this conclusion. First, there is much genetic variation **WITHIN** each race, but little **BETWEEN** races. Once again, we let him speak: "The main genetic differences are between individuals and not between populations, or so-called 'races.' Differences of genetic origin among the latter are not only small...but also superficial, attributable mostly to responses to the different climates in which we live. Moreover, there are serious difficulties in distinguishing between genetic and cultural differences, between nature and nurture (p.viii)."

His argument boils down to this. Small genetic differences between groups translate into only very minor observable differences between them. This is not necessarily so. Very small genetic differences between two racial groups can lead to dramatic, observable results. Consider the example of sickle-cell anemia, a severe hereditary disease that afflicts a large percentage of Black Africans, and a significant percentage of Black Americans, but is virtually absent among American whites. 3 According to an authoritative biology text, *LIFE ON EARTH*, "The sickle-cell condition is under the control of a single gene." 4 If a person has a "double dose" of the gene, he dies in childhood or suffers from chronic anemia. If endowed with only a "single dose" of the gene, the person shows signs of anemia only under conditions of stress, but also, displays

significantly greater resistance to malaria than those lacking the gene. Thus we see that a small genetic difference--brought about by only one gene--between two racial groups leads to significant differences between them in resistance to malaria and susceptibility to anemia.

This could very well hold true for many behavioral characters as well. Two groups, A and B, can share 99% of the same human genes and characteristics. They can be virtually identical. Nevertheless, if the 1% variation occurs in a characteristic that helps determine success in a certain endeavor, say mathematics, then group A might produce 90% of the mathematicians, group B only 10%.

There is a egregious example of how a small genetic difference between two different ethnic groups will have dramatic military consequences. The respected LONDON TIMES reported that "Israel is working on a biological weapon that would harm Arabs but not Jews, according to Israeli military and western intelligence sources. The weapon, targeting victims by ethnic origin, is seen as Israel's response to Iraq's threat of chemical and biological attacks." 5

The article continues: "The intention is to use the ability of viruses and certain bacteria to alter the DNA inside their host's living cell. The scientists are trying to engineer deadly micro-organisms that attack only those bearing the distinctive genes." 6

A scientist involved with the Israeli facility that is sponsoring the project was quoted as saying the researchers "have succeeded in pinpointing a particular characteristic in the genetic profile of certain Arab communities, particularly the Iraqi people." 7

One wonders if Cavalli-Sforza would dare tell the Arab people who are targeted by such a weapon that "genetic differences between you and the Jews are of little consequence."

Furthermore, some population geneticists admit that the data "...which indicate much more genetic variation within than among human races, may be misleading." 8 Cavalli-Sforza may have measured many particular gene frequencies which are similar in all races, but failed to measure many of those gene frequencies which do vary widely between the races.

Cavalli-Sforza puts forth another argument in an attempt to convince his readers the genetic differences between the races are only superficial. Because the division of humanity into separate groups had occurred so recently in human history, there was not enough time for the evolution of significant biological differences. "It is impossible," this population geneticist claims, "to generate much diversity in such a short period of time, which convinces us once and for all that the superficial racial differences we perceive between people from different continents are just that (p.xii)."

He appears to have contradicted himself, for in another part of the book, he writes: "We could

ask if sufficient time has passed since the settling of the continents to produce these biological adaptations [i.e., the biological differences between the races such as skin color, etc.]. The selection intensity has been very strong, so the answer is probably yes (p.12)."

If the selection intensity has been strong enough to produce such glaring differences in skin color, eye shape, hair type, body and facial form in a short amount of evolutionary time, then why couldn't the selection intensity have also been strong enough to produce significant mental and behavioral differences as well?

Are there racial differences? Furthermore, one does not need long periods of time (in geological terms) for significant biological differences to evolve. Biologist Richard Goldsby: "Given the inefficiency of race formation when neither selection nor isolation is absolute, just how many generations might be necessary for the differentiation of a parent population into clearly recognizable racial varieties? The answer comes from studies of race formation in the house sparrow. The founding population of sparrows was introduced into America in 1852. From an East Coast zone of entry, succeeding generations have spread west to California, south into Mexico, and north into Canada. Populations of sparrows can now be found in damp coastal areas of Louisiana and in the dry, hot deserts of Arizona. Today, one can demonstrate that different geographical populations of sparrows show characteristic differences in color, wing length, bill length, and body weight. Using these differences as guides, more than a dozen racial varieties of sparrows can be identified...Before the results of this study were published a few years ago, evolutionary theorists assumed that more than 1,000 generations would be necessary for racial differentiation in birds. The discovery that all these races of sparrows evolved within one hundred generations came as a bombshell.

IT IS CLEAR THAT IN NATURE EVOLUTION AT THE RACIAL LEVEL CAN BE EXTREMELY RAPID. In a human population one hundred generations cover a time span of about 2,000 years. These studies suggest that given a reasonable degree of isolation and selection pressure, relatively short periods may be required for the elaboration of some racial characteristics in man (emphasis added)." 9

The irony of it all is that the pet evolutionary theory of leftist and a believer in the genetic equality of all mankind, Stephen Jay Gould, may very well explain the evolution of significant genetic differences between the races in a relatively short amount of evolutionary time. His theory, "Punctuated Equilibria," postulates that a species changes rapidly as it comes into existence (i.e., diverges from the parent species), but quite slowly thereafter. 10 Why then couldn't human races have changed very quickly and very significantly in a short amount of evolutionary time as they came into existence? If, in one hundred generations, races of house sparrows evolved which have substantial genetic differences between them, then isn't it also possible that in hundreds of thousands or only tens of thousands of years races of humans could evolve with substantial genetic differences between them?

Cavalli-Sforza claims the classification of humans into races is based on arbitrary criteria, totally dependent on the whims of the classifier. As a consequence, "Different anthropologists come to completely different tallies of races, from 3 to over 100 (p.27)." He continues: "...it is immediately clear that all systems lack clear and satisfactory criteria for classifying (p.29)." Ultimately, Professor Cavalli-Sforza concludes that it is wise "to abandon any attempt at racial classification along the traditional lines (p.29)."

Cavalli-Sforza has also noted that "It is very useful, and I think essential, to examine all existing information (p.20)." But he clearly ignores significant scientific evidence which contradicts his beliefs. The psychologist J. Philippe Rushton classified human populations along somewhat traditional lines--people of east Asian ancestry (Mongoloids, Orientals), people of African ancestry (Negroids, blacks) and people of European ancestry (Caucasoids, whites)--and found that these classifications have much predictive and explanatory power. On more than 60 variables--such as brain size, intelligence, reproductive behavior, etc.--Mongoloids and Negroids define opposite ends of a spectrum, with Caucasoids falling intermediately, and with much variability within each broad grouping. 11 Let it suffice to say the evidence that Rushton and others have amassed strongly suggests these findings are to a significant extent due to biological differences between the races. 12

Cavalli-Sforza defines "race" as "a group of individuals that we can recognize as biologically different from others (p.25)." Granted, the classifications of human populations along these lines is difficult and problematic, but that does not mean that scientists should cease trying. The classification of all types of biological beings, from bacteria to men, is difficult and problematic, but that does not stop scientists from making the attempt. As knowledge progresses, better and better classification schemes are created.

As Cavalli-Sforza rightly points out, there are no "pure races" of humans, only populations that tend to be separated by intergrading zones rather than by sharp lines of demarcation (pp.12-13). And here is where we can provide Cavalli-Sforza with a practical and scientific definition of "race" that can be used to classify human populations.

Psychologist Rushton concludes: "In sum, race is a biological concept. Races are recognized by a combination of geographic, ecological, and morphological factors and gene frequencies of biochemical components. However, races merge with each other through intermediate forms, while members of one race can and do interbreed with members of other races." 13

In short, we must, as Cavalli-Sforza advises (but fails to heed), examine all the existing evidence, and realize that it is the unique ensemble of all the aforementioned characteristics--gene frequencies, and physical and geographical characteristics--which differentiate races, not just a few arbitrary chosen traits.

FOOTNOTES

1. Luigi Luca Cavalli-Sforza, GENES, PEOPLES, and LANGUAGES (North Point Press, 2000). Hereafter, all page numbers in this essay refer to this book.
2. Quoted in THE NEW YORK REVIEW OF BOOKS, 13 April 2000, p.61.
3. Richard A. Goldsby, RACE AND RACES (Macmillan, 1977), pp.10-11, 96-101.
4. Edward O. Wilson and Thomas Eisner, LIFE ON EARTH (Sinauer, 1978), p.651.
5. SUNDAY TIMES OF LONDON, 15 November 1998, p.1.
6. Ibid.
7. Ibid.
8. Daniel L. Hartl, A PRIMER OF POPULATION GENETICS (Sinauer, 1981), p.81.
9. Goldsby, pp.88-89.
10. For a discussion of Punctuated Equilibria theory, see Douglas Futuyma, EVOLUTIONARY BIOLOGY (Sinauer, 1979), pp.127-128.
11. RACE, EVOLUTION, AND BEHAVIOR (Transaction Publishers, 1995), p.xiii, passim.
12. Ibid. The following are just two more of the many works one could cite to support this statement. R.J. Herrnstein and C. Murray, THE BELL CURVE: INTELLIGENCE AND CLASS STRUCTURE IN AMERICAN LIFE (Free Press, 1994); Roger Pearson, ed., SHOCKLEY ON EUGENICS AND RACE: THE APPLICATION OF SCIENCE TO THE SOLUTION OF HUMAN PROBLEMS (Scott-Townsend, 1992).
13. Rushton, p.96.

Race Differences in Intelligence: a Global Perspective

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The world literature on racial differences in intelligence is reviewed from three points of view. Firstly, studies using intelligence tests indicate that Caucasoids in North America, Europe and Australasia generally obtain mean IQs of around 100. Mongoloids typically obtain slightly higher means in the range of 100-106. African Negroids obtain mean IQs of around 70, while Negroid-Caucasoids in the United States and Britain obtain means of about 85. Amerindians and the South East Asian races typically obtain means in the range of 85-95.

A second source of evidence comes from studies of reaction times which provide measures of the neurological efficiency of the brain. These studies show that Mongoloids have the fastest reaction times, followed by Caucasoids and then by Negroids. Thirdly, the races can be assessed for their contributions to civilization. Here the Caucasoids and the Mongoloids have made the most significant advances both in the foundation of the early civilizations and in more recent developments.

The existence of racial differences in intelligence has been known since the time of the First World war when tests given to large numbers of military conscripts in the United States revealed that blacks had an average intelligence level about 15 IQ points below that of whites. In the following decades there has been debate over the question of whether these differences have a genetic basis. This debate has largely taken place in the context of the differences in intelligence found in different racial populations in the United States. Genetic theorists have pointed to the high heritability of intelligence and the difficulties of formulating credible environmentalist explanations to explain the difference (Jensen 1972, 1973, 1980; Eysenck, 1971). Environmentalists have pointed to a variety of factor-s which they consider capable of explaining the low Negroid IQ, of which the most important are bias in the tests, the adverse social and economic living conditions experienced by blacks, discrimination and prejudice from white majorities and the historical legacy of slavery which has demoralized blacks and destroyed their family structure (Flynn, 1980; Jaynes and Williams, 1989; Mackintosh and Mascie-Taylor, 1985). Neither side has yet succeeded in convincing the other and the issue remains unresolved, although a recent poll has shown that the majority of experts now believe there is some genetic basis to the low black IQ (Snyderman and Rothman, 1988).

The Purpose of the present paper is to consider the problem of racial differences in intelligence in a global perspective. Part one of the paper contains a review of the many studies which have

been made of the intelligence of different races throughout the world. The principal question here is whether the world wide evidence supports the genetic or the environmental position.

In general terms the genetic theory requires that there should be a reasonably high degree of consistency of the intelligence levels shown by populations of different races in a variety of geographical locations. Thus, Negroids should universally have lower intelligence levels than Caucasoids and this difference should be found in Africa and the West Indies as well as in the United States and Britain. The reason for this is that the genes or alleles (alternative forms of genes) for low intelligence, if these exist, should be present in all Negroid populations and not merely in those whose ancestors were transported as slaves to the New World. Furthermore, Negroids in the United States and Britain are nearly all Negroid-Caucasoid hybrids (Reed, 1969). Their Caucasoid genes should, on the genetic hypothesis, raise their intelligence level as compared with the pure Negroids of Africa. Hence the genetic theory demands that African Negroids should have lower intelligence levels than the Negroid-Caucasoid hybrids of the United States and Britain. Whether or not this is the case can be regarded as a test of the genetic theory and any studies showing that pure African Negroids have higher IQs than American or British Negroid hybrids would falsify the genetic hypothesis.

A similar degree of consistency of intelligence levels should be found for all races if the intelligence is largely genetically determined. The intelligence of Caucasoids should be approximately the same, whether they live in the United States, Britain, Europe, Australia or New Zealand. The same consistency should be present in the third major race of mankind, the Orientals or Mongoloids, who are present not only in their native habitat of north east Asia but also in the United States and Europe. Hence a world wide examination of the consistency of racial differences in intelligence would provide a perspective on the genetic and environmental theories which is lacking in the studies carried out in the local contexts of the United States and, more recently, in Britain.

Part two of the paper deals with the question of whether the racial differences in intelligence as measured by intelligence tests are also present in reaction times, i.e. the speed of response to simple stimuli. The interest of this question is that recent work has shown that reaction times are a measure of intelligence and appear to represent differences in the neurological efficiency of brain processes (Jensen, 1982; Eysenck, 1982). A positive finding of racial differences in reaction times would rule out many of the explanations for the intelligence differences advanced by environmentalists such as bias in the tests, the legacy of slavery and so forth, and would point to a genetically determined neurological basis for the differences. Whether or not there are racial differences in reaction times which run parallel with those in intelligence therefore provides a further test of the genetic and environmental theories.

Part three of the paper considers the racial differences in the foundation and advancement of civilization. The establishment of civilization required numerous discoveries such as the invention of writing and arithmetic and these must have been due to the work of highly

intelligent individuals. This part of the paper considers whether the racial differences in the establishment of civilizations are the same as those found in the performance of intelligence tests.

Intelligence Test Performance

Intelligence tests were developed in the first two decades of the century and in the following seventy years numerous studies have been published of the intelligence of different peoples in many parts of the world. The principal studies have been collated and classified by the race and are summarized in Tables I through 6. Intelligence was initially conceptualized as a single entity quantified by the intelligence quotient and many studies have reported racial differences in terms of a single $I(2)$. The theoretical basis for representing intelligence in terms of a single $I(2)$ is Spearman's (1927) work identifying a general factor present in all cognitive tests and his conceptualization of this as general intelligence, now known as Spearman's g , and identified as a generalized problem solving ability which enters into the performance of all cognitive tasks.

This theory of intelligence was challenged in the nineteen thirties by Thurstone (1938) who proposed an alternative model which dispensed with the concept of Spearman's g and postulated six primary mental abilities designated reasoning, spatial, numerical, verbal, perceptual speed and fluency abilities. In the late nineteen-forties an integration of the Spearman and Thurstone models was proposed by Burt (1949). This consisted of a hierarchical model of intelligence in which Spearman's general factor was split into two correlated group factors now generally known as the verbal and visuospatial abilities. These can in turn be broken down further into narrower primary abilities, of which some twenty to thirty have been identified (Cattell, 1971). Burt's model is widely accepted in contemporary psychology and is adopted in this paper. Where possible means for different populations are given for general intelligence (Spearman's g) and for the verbal and visuospatial abilities. Intelligence tests are normally calibrated with the mean IQ set at 100 and the standard deviation at 15. This metric has been adopted and the mean IQ of American Caucasoids set at 100 to serve as the standard in terms of which IQs of all other populations are expressed. Further details of the methods used for the calculations of mean IQs for different populations are given in the appendix.

Caucasoids

Mean IQs for Caucasoid peoples in the United States, Britain, Continental Europe, Australia and New Zealand are set out in Table 1. In this and in subsequent tables summary results are given for the geographical location of the sample, the age of the subjects, the numbers, the tests used and mean IQs for general, verbal and visuospatial intelligence. General intelligence is conceptualized as Spearman's g , the general factor present in all cognitive tasks, and most effectively measured by tests of reasoning ability such as Raven's Progressive Matrices and Cattell's Culture Fair Test. It can also be measured by omnibus tests such as the Wechslers and the Stanford Binet. Results from all these tests are entered in the tables under general

intelligence. Verbal IQs in the tables are derived from the verbal scales of the Wechslers and from verbal comprehension scales in such tests as the Differential Aptitude and the McCarthy. Visuospatial IQs are derived from the performance scales of the Wechslers and from visuospatial scales in the Differential Aptitude, the McCarthy and similar tests, and from figure copying tests such as the Draw-a-Man.

Inspection of the results set out in the table will show firstly that Caucasoids in the United States and Britain obtain virtually identical mean IQs. This was first demonstrated in the 1932 Scottish survey of 11 years olds who obtained a mean IQ of 99 on the American Stanford Binet. The subsequent studies shown in the table under Scotland and Britain confirm this result. The earlier standardization of tests in the United States were generally based on normative samples of Caucasoids only, such as the early Stanford Binet and Wechsler tests, but the later standardizations such as the WISC-R included Negroids. For this reason an adjustment has to be made to American means for later tests, because when the mean of the American total population is set at 100, the mean of American Caucasoids is 102.25, as derived from the standardization sample of the WISC-R (Jensen and Reynolds, 1982).

Further inspection of the results set out in Table i shows that the mean IQs from all these Caucasoid populations lies in the range of 94-107, with the single exception of a low value of 87 for Spain found by Nieto Alegre et al (1967). The variations between and within the countries are probably due principally to differences in sampling accuracy and procedures and to differences in living standards. Differences in sampling accuracy and procedures can occur because of the difficulty of obtaining representative samples and to differences in whether the mentally retarded are included. In the case of children, those in private schools may or may not be included in the samples. Sampling differences are probably largely responsible for a number of the discrepancies in the means obtained from the same country, e.g. the two studies of general intelligence in Australia give means of 95 and 104, and the three studies of France give means of 98, 104 and 94.

The largest discrepancy in the table is between the mean IQ of 87 for Spain obtained by Nieto Alegre et al and the mean of 98 obtained by Buj. This probably arises from a sampling difference between the two studies. Nieto Alegre et al obtained their sample from military conscripts drawn from the whole of Spain, whereas Buj drew his samples for Spain and other countries from the populations of the capital cities. While the sampling procedure adopted by Buj seems reasonable, it is probable that in less economically developed countries like Spain with a rather backward peasant population there are considerable differences between the mean IQs in the rural areas and in cities. In fact in the Nieto Alegre study there was a range of approximately 15 IQ points between the means of the conscripts from the poorest rural regions and the most prosperous and more urbanized centers. As countries have become more industrialized the numbers of their rural peasantry have declined and rural-urban differences in intelligence have largely disappeared. Thus Scotland was a largely urbanized country by the 1930s and at this time there was virtually no difference in mean IQ between urban and rural

children (Scottish Council for Research in Education, 1939). In addition to differences in sampling, some of the differences between these Caucasoid populations may also be ascribed to differences in living standards. There is a wide range of these among this set of nations. For instance, in Spain which produced the lowest mean IQ of 87 for military conscripts tested in 1965, the per capita income in that year was 770 US dollars as compared with \$2,003 in Britain and \$4,058 in the United States (United Nations, 1970). Low incomes have an adverse effect on intelligence because poor people have less to spend on nutritious foods and tend to have less leisure to give their children cognitive stimulation. Nevertheless, in spite of these considerable differences in living standards, the overall picture of the results summarized in Table I is one of fairly close similarity of mean IQs among these diverse Caucasoid populations.

The last entries in Table 1 are for the IQs of Indians derived from the Indian sub-continent, South Africa and Britain. The mean of 86 in India is derived from a review by Sinha (1968) of the results of 17 studies of children aged between 9 and 15 years and totalling in excess of 5,000. Mean IQs lie in the range of 81 to 94, with an overall mean of approximately 86. But ethnic Indians in Britain obtain a mean of 96 which is within the range of other Caucasoid populations. Their verbal IC~ of 89 is depressed, but this is probably because their families are recent immigrants and have not yet mastered the language. The British results suggest that when Indians are reared in an economically developed environment their intelligence level is about the same as that of European Caucasoids.

Mongoloids

The Mongoloid peoples are those indigenous to north east Asia, north of the Himalayas and east of the Yenisey river. Their mean IQs are set out in Table 2. It will be seen that for general intelligence the Mongoloid peoples tend in the majority of studies to obtain somewhat higher means than Caucasoids. This is the case in the United States, Canada, Europe, Japan, Hong Kong, Taiwan, Singapore and The People's Republic of China. The range is from 97 to 110, with a mean of around 106. The lowest figure is the mean of 97 obtained by Stevenson et al for Japanese 6 year olds. One explanation for this result is probably that Mongoloids tend to be late maturers. There is a good deal of evidence for this reviewed in Lynn (1987). It will be noted that the same investigators obtained a mean of 102 for Japanese 11 year olds. A further factor is that Stevenson obtained his American comparison sample from the city of Minneapolis in Minnesota and the mean Caucasoid IQ in Minnesota is 105 (Flynn, 1980, p. 107). This means that 5 IQ points should be added to all of Stevenson's Japanese means.

There is some dispute about the mean IQs of ethnic Mongoloids in the United States. Vernon (1982) reviewed the literature and concluded that the mean non-verbal IQ (general intelligence) was around 110 and the verbal IQ 97. These figures have been questioned by Flynn (1989) who maintains that the respective means are approximately 100 and 97. The best single study of American ethnic Mongoloids appears to be the Coleman et al (1966) report of five age groups spanning the years 6-16 from which Flynn's figures are derived. But there are problems with

the Coleman study. One is that in this and other studies the category of Orientals may include Filipinos, whose mean IQ is about 85 (Flynn, 1991) and who therefore pull down the mean of ethnic Chinese and Japanese. Filipinos constitute about 20 per cent of American Orientals and if these are taken out of the Coleman sample the remainder who are largely ethnic Chinese and Japanese obtain a mean non-verbal IQ of 103 and a mean verbal IQ of 98. A further problem in the Coleman data concerns the nature of the tests of "non verbal ability". Coleman himself is careful to state that the non verbal tests used in his study were not measures of intelligence. The tests were of math ability largely set out in verbal format and this will have given the tests a verbal bias and handicapped Orientals (Coleman 1990). Probably the Coleman non verbal ability tests should not be considered as good measures of general intelligence or Spearman's g . The weaknesses of the American studies of ethnic Orientals is that hardly any of them provide a good measure of visuospatial abilities or of Spearman's g .

If Flynn should prove to be correct it would appear that the mean IQ of American ethnic Orientals is a little below that of Mongoloids in the countries of the Pacific rim. The explanation for this may be that the early Chinese and Japanese immigrants from whom the majority of ethnic Orientals are derived may have been below the average intelligence levels of their parent populations in Asia. The early immigrants came largely as laborers to build the railways and do other unskilled work developing the infrastructure of the west coast. This not particularly desirable work may have attracted those of less than average ability. If this is so, the high educational and occupational achievements of ethnic Orientals in the United States may be due to high work motivation rather than high intelligence levels.

A striking feature of the results for Mongoloids is that their verbal IQs are consistently lower than their visuospatial IQs. In most studies the differences are substantial amounting to between 10 to 15 IQ points. This pattern is present in Japan, Hong Kong, the United States and Canada. It has also been found among ethnic Japanese in Hawaii although these data are not presented in a form from which mean IQs can be calculated (Nagoshi and Johnson, 1987). This difference is also picked up in the United States in performance on the Scholastic Aptitude Test (SAT), on which ethnic Orientals invariably do better than Caucasians on the mathematics test (largely a measure of general intelligence and visuospatial ability) but less well than Caucasians on the verbal test (Wainer, 1988). A further manifestation of the strong visuospatial and weak verbal abilities of ethnic Oriental Americans lies in their tendency to do well in professions like science, architecture and engineering which call for strong visuospatial abilities and poorly in law which calls for strong verbal abilities. This pattern of occupational achievement has been well documented by Weyl (1969, 1989) in his studies of the achievements of the major American ethnic populations. His method involves the analysis of the frequencies of ethnic names among those who have achieved occupational distinction calculated in relation to their frequencies in the general population. Thus he finds that common Chinese names like Wong are greatly overrepresented in American Men and Women of Science, as compared with their frequency in the general population, but under represented in Who's Who in American Law. On the basis of this method he constructs a performance co-efficient for which average

achievement is 100. A co-efficient of 200 means that an ethnic group appears twice as frequently in reference works of occupational distinction as would be expected from its numbers in the total population, while a co-efficient of 50 means that it appears half as often. In his first study he finds that ethnic Chinese obtained performance co-efficients of 506 in architecture, 308 in engineering and 438 in science but only 54 in law (Weyl, 1969). His second study oil later data confirms this pattern for the 1980s, when ethnic Chinese obtained a performance co-efficient for science of 620, while for law their performance co-efficient was only 24.

It is easy to understand how this remarkable disparity arises. Adolescents typically discover that they tend to be good at some things and poor at others. There is a natural tendency for young people to concentrate on those activities they are good at, be they sciences, languages, arts, music, sport or whatever, and to make their careers in them. The reason that different people are good at different things depends partly on genetic and partly on environmental differences. The widespread appearance of the strong visuospatial - weak verbal ability pattern among Mongoloids in so many diverse geographical locations suggests that it has a genetic basis and that this is responsible for their striking over-achievement in the sciences and architecture and under-achievement in law.

Negroids

The mean IQs of Negroids have invariably been found to be substantially lower than those of Caucasoids. Many studies have been done in the United States and by the mid-1960's Shuey (1966) was able to present a summary of 362 investigations. The overall mean IQ of American Negroids was approximately 85. Subsequent studies in the United States such as those of Coleman (1966), Broman, Nichols and Kennedy (1975) and others have confirmed that this is about the right figure.

As a result of these studies it is sometimes assumed that the mean IQ of all Negroids is approximately 85 or 1 standard deviation below that of Caucasoids. However, it has to be noted that almost all American Negroids are Negroid-Caucasoid hybrids (Reed, 1989) and the same is probably true of most Negroids in the West Indies and Britain. To obtain mean IQs Of pure Negroids it is necessary to take samples in Africa. For this reason mean I(Zs for pure African Negroids are listed separately in Table 3 from Negroid-Caucasoid hybrids in the United States, Britain, the West Indies and South Africa.

The first good study of the intelligence of pure African Negroids was carried out in South Africa by Fick (1929). He used the American Army Beta Test, a non verbal test devised in the United States in the First World War for testing recruits who could not speak English, and administered it to 10-14 year old Caucasoid, Negroid and Colored (Negroid-Caucasoid hybrids) school children. In relation to the Caucasoid mean of 100, based on more than 10,000 children, largely urban pure Negroid children obtained a mean IQ of 65, while urban Colored children

obtained a mean IQ of 84. It is interesting to note that these South African Coloreds or Negroid-Caucasoid hybrids obtained a mean IQ virtually identical to that of American Caucasoid-Negroid hybrids.

The other studies of the IQs of pure Negroids summarized in Table 3 show means in the range 65-81. Vernon tested his small sample in Kampala with a number of tests and the overall mean was about 80, but this sample was drawn from an academic secondary school and the result suggests that the mean for the population would be around 70. The best single study of the Negroid intelligence is probably that of Owen (1989), who presents results for 1093 16 year olds in the eighth grade who had been in school for around 8 years and should have been well versed in paper and pencil tests. The test used was the South African Junior Aptitude which is well constructed and standardized and provides measures of verbal and non verbal reasoning, spatial ability, verbal comprehension, perceptual speed and memory. The mean IQ of the sample in comparison with Caucasoid South African norms is 69. It is also around the median of the studies listed in Table 3. It is proposed therefore to round this figure up to 70 and take this as the approximate mean for pure Negroids.

Negroid-Caucasoid Hybrids

As noted, virtually all American Negroids are hybrids with some Caucasoid ancestry. The same is probably the case with West Indian and British Negroids. Although this has never been documented, West Indian Negroids lived as slaves on white owned plantations from the 17th to the 19th century in similar conditions to those of Negroids in the United States. There was undoubtedly a certain amount of interbreeding between white estate owners and Negroid slaves, which gave rise to a number of Negroid-Caucasoid hybrids whose existence as a considerable class was noted by Anthony Trollope in his *Tour of the West Indies*.

The results for Negroid-Caucasoid hybrids are shown in Table 4. For the United States, seven major- post Shuey (1966) studies are listed because of their special interest by virtue of the large number of subjects, because they yield IQs for the verbal and visuospatial abilities, or because they are derived from young children. These show that the Negroid mean IQ of approximately 85 is present among children as young as 2-6 year-olds.

In Britain the three major studies of Negroids obtained mean IQs of 86, 94 and 87, broadly similar to those in the United States. Figures are available for two of the Caribbean islands, namely Barbados (mean IQ = 82) and Jamaica (mean IQ = 66-75).

The Negroid-Caucasoid differences appear to be of about the same magnitude for general intelligence and the verbal and visuospatial abilities. Detailed studies by Jensen and his colleagues have shown that when samples are carefully matched the Negroid-Caucasoid differences are greatest for general intelligence (Spearman's *g*) and for the visuospatial abilities and less for verbal ability (Jensen and Reynolds, 1982; Reynolds and Jensen, 1983; Naglieri and

Jensen, 1987). Nevertheless, the broad picture, taking the results as a whole, is that the three abilities are of approximately equal magnitude. This also appears to be the case in South Africa according to the results of Owen.

Amerindians

The results of studies of the intelligence of Amerindians are summarized in Table 5. The mean general IQs have invariably been found to be somewhat below that of Caucasoids. The largest study is that of Coleman et al (1966) which obtained a mean of 94, but a number of studies have reported means in the 70-90 range. The median of the 15 studies listed is 89 which can be taken as a reasonable approximation, indicating that the Amerindian mean IQ falls somewhere between that of Caucasoids and Negroid-Caucasoid hybrids. The same intermediate position is occupied by Amerindians in performance on the Scholastic Aptitude Test (Wainer, 1958).

In addition, all the studies of Amerindians have found that they have higher visuospatial than verbal IQs. The studies listed are those where the Amerindians speak English as their first language, so this pattern of results is unlikely to be solely due to the difficulty of taking the verbal tests in an unfamiliar language. The verbal-visuospatial disparity is also picked up in the Scholastic Aptitude Test, where Amerindians invariably score higher on the mathematical test than on the verbal (Wainer, 1988). The strong visuospatial-weak verbal pattern of abilities in the Amerindians resembles that of the Mongoloids, although in the Mongoloids the whole ability profile is shifted upwards by some 10-15 IQ points. This similarity is not altogether surprising in view of the close genetic relationship of the two races, Amerindians being an offshoot of the Mongoloids who crossed the Bering Straits from north east Siberia into Alaska at some time in prehistory. The similarity of the cognitive profile of the two races suggests that this profile was present in the common stock from which both contemporary races are derived, and that some factor raised the intelligence levels in the Mongoloids following the geographical differentiation of the two races.

South East Asians

The South East Asian races comprise Polynesians, Micronesians, Melanesians, Maoris and Australian Aborigines. The results of intelligence test studies of these subraces are shown in Table 6. Apart from the low mean of 67 for a small sample of Australian Aborigine children, all the mean IQs lie in the range of 80-95. The one study to include measures of general, verbal and visuospatial abilities for New Zealand Maoris shows that this group does not share the strong visuospatial-weak verbal ability profile of Mongoloids and Amerindians. Although the intelligence of this group of peoples has not been extensively researched there are sufficient studies to suggest a mean IQ of about 90.

Racial Differences in Reaction Times

It has often been argued that the racial differences in intelligence test performance may be due to the tests being biased or to a variety of environmental factors such as differences in education, experience of dealing with visual representations, motivation, attitudes towards test taking and nutrition. The alternative theory is that these differences have a genetic basis. In order to test for which of these different explanations is correct, a study has been carried out to determine whether the racial differences in intelligence are also present in reaction times. The rationale of the study is that reaction times provide a measure of the brain's neurological efficiency in dealing with very simple tasks and are unaffected by education, motivation and other environmental factors with the possible exception of extreme malnutrition.

It has been shown in a number of studies that reaction times are positively associated with intelligence, and the explanation widely accepted for this association is that reaction times provide a measure of the neurological efficiency of the brain in analysis and decision making (Jensen, 1982; Eysenck, 1982). Hence if there are racial differences in reaction times of the same kind as those present in intelligence test performance, it can be inferred that these differences lie at the neurological level and probably reflect genetic differences.

Reaction times consist of the speed with which a subject reacts to simple stimuli. Normally a light comes on and the subject has to press a button to turn it off. Reaction time tasks can be varied to present different degrees of difficulty. In the present study three reaction time tasks were used of different degrees of difficulty. In the simplest task a single light comes on and the subject moves his hand to switch it off. This response normally takes around half a second. In more complex situations, one of several lights comes on and has to be switched off. These are known as choice reaction times and take a little longer. In a still more complex task, three lights come on of which two are close together and one stands apart. Here the subject has to judge which is the light that stands apart and switch it off. This is known as the odd man out task. It is more difficult than the simpler reaction time tasks and typically takes about twice as long.

All three reaction time tasks were used in the present study. In addition, the apparatus used in the investigation was designed to measure two separate processes in reaction time tasks known as movement times and decision times. In these tasks the subject has to make a decision about what to do (decision times) and then execute the decision by moving the finger to switch off the light (movement times). Both these times were recorded automatically on disks by a microcomputer.

The subjects used in the study consisted of 9 year old children representative of the three major races of Mongoloids, Caucasoids and Negroids. The Mongoloids were obtained from Hong Kong and Japan, the Caucasoids from Britain and Ireland and the Negroids from South Africa. All the children were drawn as socially representative samples from typical public primary schools in their respective countries with the exception of the Irish children who came from rural areas and whose mean IQ was rather lower than would otherwise have been expected.

In all the five samples decision times, movement times and variabilities were negatively correlated with intelligence. Further details of the reaction time apparatus, testing procedures and analyses of the relationship between the reaction time measures and intelligence for the samples are given in Shigehisa and Lynn (1991), Chan, Eysenck and Lynn (1991) and Lynn and Holmshaw (1991).

Summary statistics for the five samples giving the numbers tested, mean IQs, means for the 12 reaction time measures and standard deviations for the entire sample are shown in Table 7. The last column of the table gives product moment correlations between the Progressive Matrices and the 12 reaction time measures. It will be seen that the Hong Kong and Japanese children obtained the highest mean IQs, fastest decision times and low decision time variabilities, the British and Irish children were intermediate, while the South African Negroids obtained the lowest means on the Progressive Matrices, slowest decision times and highest variabilities. All the correlations are high and five of the six are statistically significant.

The movement times of the five populations do not show any consistent overall relationship with Progressive Matrices scores. It is however interesting to note that the Negroid children tend to have fast movement times. In the complex and odd man out tasks their movement times are significantly faster than those of British, Irish and Chinese children.

It is known that the speed of reaction times is genetically determined to a significant extent. This has been shown by Vernon (1989) in a study of 50 identical and 52 non-identical twins, which produced a heritability coefficient of .51 for reaction times. Somewhat similar results have been reported by Ho, Baker and Decker (1988) for two other speed of information processing tasks which gave heritability coefficients of .47 and .24. These authors have also shown that the positive correlation between measures of speed of information processing and intelligence arises from common genetic processes suggesting that common genetically controlled neurological mechanisms are involved in the performance of both types of task.

It is therefore considered that the most reasonable interpretation of the Mongoloid-Caucasoid-Negroid results is that these reflect genetic differences between the three racial groups. It is not considered likely that educational differences could be involved because of the extreme simplicity of the tasks. Motivational differences are improbable, because reaction times seem unaffected by motivation (Jensen, 1982). It might be thought that nutritional differences might be involved.

However, the fact that the Negroid children performed faster than the Caucasoid on movement times makes it unlikely that poor nutrition could have reduced neural conduction rates. We are therefore left with genetically determined differences in information processing capacities as the most probable explanation of the Mongoloid-Caucasoid-Negroid differences in decision times.

Contributions to Civilization

A third source of evidence on racial differences in intelligence lies in the degree to which the various races have made significant intellectual, scientific and technological discoveries and inventions. The argument is that these advances are likely to be made by a few outstanding and highly intelligent individuals. There will be more of these in a population where the average level of intelligence is high, and hence the intelligence levels of populations and whole races can be inferred from their intellectual achievements.

The first writer to advance this argument was Galton (1869) but he limited his analysis to the Greeks of the classical period, England and Scotland, the Negroids and the Australian Aborigines. His conclusion was that the Greeks produced the greatest number of intellectual advances and could therefore be considered the most intelligent population. He placed the Scots marginally above the English, and a long way below these he placed the Negroids and the Aborigines.

Galton's treatment of the problem was sketchy, but it provided the initial idea on which others were to build. The most extensive analysis of this kind was carried out by Baker (1974). He first set up twenty one criteria by which the achievements of early civilizations could be judged. These were as follows:

In the ordinary circumstances of life in public places, they cover the greater part of the trunk with clothes.

They keep the body clean and take care to dispose of its waste products.

They do not practice severe mutilation or deformation of the body, except for medical reasons.

They have knowledge of building in brick or stone, if the necessary materials are available in their territory.

Many of them live in towns or cities, which are linked by roads.

They cultivate food-plants.

They domesticate animals and use some of the larger ones for transport (or have in the past so used them), if suitable species are available.

They have knowledge of the use of metals, if these are available.

They use wheels.

They exchange property by the use of money.

They order their society by a system of laws, which are enforced in such a way that they ordinarily go about their various concerns in times of peace without danger of attack or arbitrary arrest.

They permit accused persons to defend themselves and to bring witnesses for their defence.

They do not use torture to extract information or for punishment.

They do not practice cannibalism.

Their religious systems include ethical elements and are not purely or grossly superstitious.

They use a script (not simply a succession of pictures) to communicate ideas.

There is some facility in the abstract use of numbers, without consideration of actual objects (or in other words, at least a start has been made in mathematics).

A calendar is in use, accurate to within a few days in the year.

Arrangements are made for the instruction of the young in intellectual subjects.

There is some appreciation of the fine arts.

Knowledge and understanding are valued as ends in themselves.

Having set up these criteria, Baker proceeded to analyze the historical record of the races to ascertain which have originated civilizations. His conclusion was that the Caucasoid peoples developed all 21 components of civilization in four independent locations. These were the Sumerian in the valley of the Tigris and the Euphrates, the Cretian, the Indus Valley, and the ancient Egyptian. The Mongoloids also developed a full civilization in the Sinic civilization in China. The Amerindians achieved about half of the 21 components in the Maya society of Guatemala, a little less in the Inca and Aztec societies, but these peoples never invented a written script, the wheel (except possibly in children's toys), the principle of the arch in their architecture, metal working, or money for the exchange of goods. The Negroids and the Australian aborigines achieved virtually none of the criteria of civilization. While Baker

confined his analysis to the achievements of the races in originating civilizations, there can be little doubt that the same race differences appear in the historically later development of more advanced cultures. During the last 2,000 years the many discoveries that constitute developed peoples have been made only by the Caucasoid and Mongoloid peoples. For the first sixteen hundred or so years of this period a case can be made out that the Mongoloid civilization in China was marginally ahead. The Han period of around 200-100 BC saw the introduction of written examinations for candidates for the mandarin civil service, an idea which was considered an advance when it was introduced into Britain some 2,000 years later (Bowman, 1989). printing was invented in China by about 800, some 600 years before it was developed in Germany. When Marco Polo visited China about the year 1300 he was amazed at the quality of civilization in the numerous prosperous cities and particularly at the use of paper money, a concept not introduced into the general use in Europe until the nineteenth and twentieth centuries. The Chinese discovered gunpowder about the year 1050 and developed the technology for using it for guns and not only, as popularly supposed, for fireworks. They were the first to invent the principle of the magnetic compass. Their technology for the manufacture of high quality porcelain was well ahead of anything in Europe until the late eighteenth century. Details of these and many other Chinese scientific and technological achievements are given in Needham (1954).

During the last five centuries the Caucasoid peoples of Europe and latterly of North America have pulled ahead of the Mongoloids in science and technology. This is probably because China has been run as a single bureaucratic empire in which innovation has been discouraged first under the emperors and more recently under the communists while Japan was isolated from outside influences until relatively recently. Europe, in contrast, has been divided into numerous states, many of which afforded a high degree of personal freedom of thought, expression and technological innovation, and between which there was open communication. Nevertheless, although the Europeans have generally been ahead of the Mongoloids during the last five centuries, since 1950 the Japanese have provided a strong challenge and have surpassed the West in the production of a number of high quality technological goods.

A useful source for evaluating the contributions of the human races to scientific and technological achievements is available in Asimov's (1989) *Chronology of Science and Discovery*. This lists approximately 1,500 of the most important scientific and technological discoveries and inventions which have ever been made. The first three are bipedality, the manufacture of stone tools and the use of fire which antedate the evolution of the races. Thereafter every single invention and discovery was made by the Caucasian or Mongoloid peoples. This compilation confirms the historical record. Who can doubt that the Caucasoids and the Mongoloids are the only two races that have made any significant contribution to civilization.

Conclusion

The studies of racial differences in intelligence test results, reaction times and scientific and technological discoveries show a high degree of consistency. All three sources of evidence indicate that the two races with the highest intelligence levels are the Mongoloids and the Caucasoids. These are followed by the Amerindians, while the south east Asian races and the Negroids are ranked lowest. The intelligence test results and the reaction times tend to indicate that average Mongoloid intelligence levels are a little higher than those of Caucasoids, but the difference is relatively small as compared with other racial differences. "The general consistency of the results from the three sources of evidence, and the consistency of the different intellectual achievements of the races over a long historical period, points to a substantial genetic determination for these differences. If genetic factors were not involved, there would have been much greater variation over time and place and the observed consistencies would not be present. Whatever criteria are adopted, the Caucasoids and the Mongoloids are the two most intelligent races and the historical record shows that this has been the case for approximately the last 5,000 years.

The environmentalist may argue that the Negroid peoples in Africa, the Caribbean, the United States and Britain, and the Amerindians, Maoris and Australian aborigines, all live in socially and economically impoverished conditions, as compared with Caucasoids and Mongoloids, and that these conditions are responsible for some or perhaps all of their low intelligence. This argument can be met by the concept of genotype-environment correlation, originally proposed by Plomin, De Fries and Loehlin (1977) and developed by Scarr and McCartney (1983).

There are two processes of genotype-environment correlation which are relevant to the present problem. The first is "passive" and has the effect that children tend to be reared in environments which are correlated with their own genetic potentialities. The principle applies for any trait which has a heritability, and this is undoubtedly true of intelligence, and in the case of intelligence means that intelligent parents transmit the characteristic genetically through their genes and environmentally through the advantageous environment which they provide for their children. The two modes of transmission have the effect that intelligent children tend to be reared in intelligence-enhancing environments. This brings the genotypes and the advantageous environments into positive correlation and implies that those reared in advantageous environments tend to have superior genotypes. This applies, for instance, to middle class children as compared with working class children, and can also, arguably, be applied to Caucasoid and Mongoloid children as contrasted with those of other races. There is a second "active" type of genotype-environment correlation which states that people play an active role in creating their own environments. Genotypically intelligent peoples are able to create a socially and economically affluent environment to an extent which cannot be done by less intelligent peoples. Scarr and McCartney call this "niche building", and the two peoples who have been successful in building socially and economically developed niches in which to live and rear their children have been the Caucasoids and the Mongoloids.

The argument frequently advanced that poor social and economic conditions are responsible for

the lower intelligence of the Negroids, Aborigines and Amerindians places the cart before the horse. It assumes that the impoverished environments of these peoples are simply the result of external circumstances over which these peoples themselves have no control. Such a claim does not stand up to examination. There are so many cases which it cannot explain, such as the achievements of Chinese, Japanese, Korean and Vietnamese immigrants in the United States and of Indians in Britain and Africa. The only plausible explanation for why these peoples have succeeded where others, initially more advantageously placed, have failed is that they have the right genotypes for building socially and economically prosperous environments for themselves and their families.

Appendix: Notes on the Calculation of IQs

One of the principal problems in the calculation of the mean IQs for the various racial populations concerns the date at which the data were collected. Mean IQs in the economically advanced nations have been increasing during the last half century (Lynn and Hampson, 1986; Flynn, 1987). This poses the problem of whether an adjustment should be made for this increase in studies where a test standardized in the United States, Britain, Australia or New Zealand has been administered some years later to another population. The adjustment involves making an addition to the American, British or Australasian means to allow for the time interval between the two test administrations. The effect is generally to increase Caucasoid IQs in relation to those of other peoples. The increases are however quite small and do not remove the higher means obtained by Mongoloid populations, as shown in Lynn (1987).

For the present paper it was decided not to make such adjustments on two grounds. Firstly, the rates of secular increase of intelligence vary widely from about 1 to 6 IQ points per decade in studies of different age groups and different tests. It is therefore impossible to obtain any precise estimate of what adjustment would be appropriate for many of the tests. Secondly, the great majority of the studies employ tests initially standardized in the United States, Britain, Australia or New Zealand. These countries have high standards of living in relation to other populations and therefore enjoy some environmental advantage for the development of intelligence. This advantage is to some degree counterbalanced by the earlier administration of the tests. The decision was therefore made not to adjust the results for other populations for the time differential between the two test administrations but to report the mean IQs as originally published. However, tests given to racial groups in the same country as the standardization samples have been reduced to allow for the secular increase in the mean IQ of the base population. This correction applies to the Kline and Lee (1972) Canadian Chinese sample, whose mean IQs are reduced by 7 IQ points to allow for the secular increase of intelligence 1947-1970; and to the Belgian Korean sample whose IQs are reduced by 10 points to allow for a secular increase of intelligence in Belgium 1954-1983. Figures for general intelligence are derived either from nonverbal reasoning tests such as the Progressive Matrices and the Culture Fair, or from full scale Wechsler IQs. In some studies only verbal and performance Wechsler IQs are reported and where this is the case these have been averaged to give an approximate

figure for the full scale IQ. Where means for Wechsler subtests are reported, the verbal IQs are calculated from Vocabulary, Information, Comprehension, Similarities and Arithmetic, and Visuospatial IQs from Block Design, Object Assembly, Picture Arrangement, Picture Completion and Mazes. The reason for this is that factor analysis has shown that these are the best measures of the two abilities (Jensen and Reynolds, 1982). In the case of non- American standardizations of the Wechslers, IQs are calculated from the WISC tests by reading the means off the standardization tables and converting to American IQs. Buj's IQs are given in relation to a British mean of 100.

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Does Race Matter - Recent Developments

By Louis Andrews

In general, the world is a rational place in which winners on the whole deserve to win and losers deserve to lose. It is only for the exception, the lives that are strikingly unfair, that we maintain the mediating devices of social welfare.

William A. Henry III

Once upon a time it was expected that changes in laws would bring about racial equality. What is one to think when, despite these laws, racial differences in achievement have changed little in the last twenty-five years? An Associated Press bulletin from October 30th, 1997 is entitled "D.C. students post disappointing scores." Recent reports indicate that a black male in Washington, D.C. has about an 85% expectation of being arrested at least once in his life. Despite over thirty years of legislation and affirmative action, the situation has in many ways worsened. What are we missing?

Gunnar Myrdal's *An American Dilemma* was published by the Carnegie Foundation fifty-three years ago and is considered the most important book published on race relations in America. In fact, one could argue that it is the single most important study of American society published in the 20th Century. Myrdal was from Sweden, a mono-racial country where black-white relations were never a problem. Essentially, Myrdal argued that the problem with American black culture was pathological. The cause of this condition was simple: discrimination. Blacks were disadvantaged because whites would not allow blacks to participate fully in American life. Since the cause was simple the solution was equally simple: end discrimination. The origins and logic of the mores of the existing society were unimportant; it is not just (said the world-renowned egalitarian socialist) therefore it must be changed.

Some strongly disagreed with Myrdal's diagnosis of pathology, including influential blacks in favour of change; but their criticisms went unheeded. For example, the black intellectual, Ralph Ellison, wrote a solicited review of *An American Dilemma* for *The Antioch Review*, but they refused to publish it because of its antagonistic approach. Ellison thought it absurd that anyone would believe that his black culture was created by discrimination. He wrote:

Can a people live and develop for over 300 years simply by reacting? Are American Negroes simply the creation of white man, or have they at least helped to create themselves out of what they found around them? Men have made a way of life in caves and upon cliffs, why cannot Negroes have made a life upon the horns of the white man's dilemma?

He argued that Myrdal's view robbed blacks of dignity. Indeed many other ethnic groups in the United States had suffered discrimination, including the Chinese, the Irish and the Jews and yet neither Myrdal nor others were calling their cultures pathological.

The pathological argument is still very much alive and played an influential role in Dinesh D'Souza's *The End of Racism*. As we shall see, one of the newest books, *America in Black and White: One Nation, Indivisible*, continues in the tradition - although with a quite different tone.

The *Brown v. Board of Education* decision in 1954, only ten years after *An American Dilemma*, was strongly influenced by Myrdal's book. Then came the civil rights revolution, which lasted over a decade. This was followed a few years later by affirmative action, ostensibly to bring America's black population into the mainstream. However, something stopped the train. Over 25 years later (1992), Andrew Hacker, in his bestseller, *Two Nations, Separate and Unequal*, could still argue that white racism is all pervasive and thus - back to Myrdal - contemporary black failure is caused by white discrimination.

Two recent books have been compared favorably to *An American Dilemma*. The new volume by Abigail and Steven Thernstrom, *America in Black and White: One Nation, Indivisible, and Why Race Matters* by Michael Levin.

The Thernstrom study has been widely reviewed and even the rather left-wing *New York Times Book Review* treated it with some respect. This hefty tome reviews the history of race (black/white) relations in America, particularly since 1865. It addresses the important issues of poverty and crime, the effects of forced integration, employment, education, and the existing differences in test scores and apparent skills between the populations.

One can presume that the title of the Thernstroms' book is a pointed response to Andrew Hacker's 1992 classic *Two Nations: Separate and Unequal*. While Hacker's valuable study is pessimistic, the Thernstrom book is optimistic but no less valuable. The books are alike in that they both consider inherent race differences non-existent, or irrelevant to the problem of race relations. One could say that Hacker considers white racism the real "problem." The Thernstroms, on the other hand, argue that while white racism was the primary problem for many years it is no longer much of a problem. To them the real issues seem to be the unwillingness of many blacks to adopt white American ideals and habits. If only blacks would "act like whites" then they would be like whites, and the whole issue of race in contemporary America will become relatively unimportant. Nevertheless both Hacker and the Thernstroms are environmentalist egalitarians. One excoriates whites for black failure, the other blames blacks for their own failure.

America in Black and White offers a massive amount of data on numerous aspects of America's racial dilemma, from poverty, crime, and politics to education. The authors acknowledge that the current gap in cognitive skills "must be closed if the black middle class is to continue to

expand." They also note that "if the African-American crime rate suddenly dropped to the current level of the white crime rate, we would eliminate a major force that is driving blacks and whites apart and is destroying the fabric of black urban life." While they present dramatic data on race differences in SAT scores (for "scores of 750 and up, the white to black ratio was 212 to 1.") they state, "we do not find IQ...a useful concept."

Nevertheless, the Thernstroms provide ample data to destroy many left-wing beliefs. Speaking of the urban riots of the 1960's they note that these "racial disorders were most likely to occur when the condition of life for blacks was least oppressive, according to objective measures, not most oppressive." One valuable aspect of the book is its clarification that most gains by blacks in education and economics occurred prior to the civil rights revolution, not after it. Thus this massive change in the structure of society has had much less impact on the well-being of the individual black person than is generally recognized. Nonetheless, this change has had significant impact elsewhere. A 1993 victim survey of crimes reported that of 1.7 million interracial crimes, 89% involved white victims and black perpetrators. This would have been unheard of in earlier years. After adjusting for population size, "Blacks were 50 times more likely to commit violent crimes against whites than whites against blacks."

So why is it, one might ask, that racial hate crimes are generally considered to be white-on-black crimes, while the huge preponderance of interracial crime is black-on-white? The answer is: politics. One position serves egalitarian political goals, the other does not. How else can one explain such anomalies as the inclusion of "Hispanic" in the category of victim, but not in the category of perpetrator? FBI crime statistics consider Hispanic perpetrators of crime to be white; but when these same whites become victimized by a crime they suddenly become Hispanics, not whites. Dice are seldom loaded for no good reason.

The Thernstroms discuss Kenneth Clark and his research on the harmful effects of segregation - used in testimony in the Brown decision. However, they fail to note that a number of white and black scholars have discovered that Clark's studies, if anything, showed that integration, not segregation, had a more harmful effect on the self esteem of young blacks. (This point was addressed by the black legal theorist Roy Brooks and discussed in the review of his book, *Separation or Integration: A Strategy for Racial Equality*, in *pinc* Vol. 1 No. 2.)

The Thernstroms do an excellent job describing the disruption caused by busing and enforced school integration. For example, in Boston, the average minority child went to a school 24% white in 1973. In 1974 Judge Garity handed down his now famous busing decision. By 1993, after huge social and financial cost to the Boston community, "the average black child attended a Boston Public schools that was only 17% white..." White enrollment in Boston's public school dropped from 62,000 in 1970 to 11,000 in 1994. Interestingly, in 1994 the cost of busing in Boston was still about 30 million dollars per year in order to avoid the segregation "problem" that busing had created.

They also briefly discuss the Kansas City debacle, where Judge Clark's order has resulted in 1.3 billion dollars extra expenditure by the school board as of 1995. This is over \$36,000 for each of the system's students. Despite the new world-class schools and other amenities, white enrollment fell further and African-American students failed to improve their academic performance. White/black test scores remained as far apart as they had ever been.

The issue of black teacher competency is raised in some detail by the Thernstroms. This has long been a hot potato. In the original 1966 Coleman Report (On Equality of Educational Opportunity) the data on black teachers was dropped entirely from the published report because they were so devastatingly bad, particularly for male teachers. Suppression of the data continued until the early 1990s, shortly before the death of Prof. Coleman. In California only 35% of African-Americans have been passing the California Basic Educational Skills Test and as a result they filed "the largest employment discrimination suit ever filed in federal court." This suit involved over 50,000 minority plaintiffs. The State of California ruling in 1966 noted that "School teachers who use improper grammar or spelling, or who make mistakes in simple calculations, modeled that behavior for their students -- much to the detriment of their education."

The Thernstroms also address the issue raised most eloquently by Jonathan Kozol, in his classic best-seller *Savage Inequalities*, of the difference in per-pupil expenditures between black and white school children. They note that the evidence from the National Center for Educational Statistics for the 1989-1990 school year found that

the higher the percentage of minority students in a school district, the higher the level of spending, even after differences in cost of living and other variables were held constant. Districts with a 'minority/majority' were not 'starved' compared to overwhelmingly white districts; they actually spent 15% more, on the average, than districts in which minority enrollment was less than 5%.

In addition, black inner city schools typically spent far more than primarily white suburban schools per student. For example, both Hartford, Conn's. and Washington DC's schools spend substantially more per pupil than their suburban surroundings. Kozol was wrong. Predominantly black school districts are generally well funded in comparison to white districts.

Concerning the value of the desegregation efforts of the 70's and 80's, the Thernstroms write, "It is plausible to think that they helped significantly, but recent analysis suggests not. Those black students who have remained in predominantly African-American Schools have improved their scores as much or more than those attending integrated schools." This fact has been noted earlier by the sociological researcher David Armor, who has studied desegregation efforts extensively in communities around the United States since the mid 1960s. As a desegregation supporter, he has nevertheless remarked that, based on the evidence, improved school performance is the last reason for one to favor desegregation.

In terms of the controversy that surrounds the policy of tracking in school, which generally results in the segregation of the tracks in integrated schools, the Thernstroms quote Thurgood Marshall, who argued in 1955, "[t]hey give tests to grade children...put the dumb colored kids in with the dumb white children, and put the smart colored children with the smart white children - that is no problem." Unfortunately, his wisdom has now been turned on its head since the higher level track is always predominantly white (and/or Asian) and the lower level track predominantly black; that is seen as prima facie evidence of discrimination instead of merely of a sorting by ability. Disparate impact does indeed have a stranglehold on reasonable solutions: since race differences are denied, discrimination becomes the only logical cause.

In addressing the differences between predominantly black and predominantly white public schools, the Thernstroms hit on an important issue - discipline differences. They mention Emily Sachar, (pg. 379) who took a job teaching 8th grade mathematics in a predominantly black school in Brooklyn. "Many kids, she discovered, had never been taught how to sit still, how to control what they said, how to behave. Her students call her 'cuntface,' told her to 'fuck off,' spat in her face, played radios during class, and threw chairs at one another." It is hard to imagine that learning can go on in such a place. Nevertheless, it makes no sense to blame whites (as Hacker does) for the breakdown in school discipline unless one is prepared to say that a majority white (or non-black) student body is a prerequisite for reasonable discipline.

One interesting feature of the Thernstroms' book is that they write approvingly about polls that seem to show that most people think that blacks and whites are equal in intelligence and that blacks and whites are about equally as likely to commit violent crimes. They see this as an indication that white racism is on the decline. However, if blacks and whites do differ in intelligence as groups (as the evidence indicates) and if black and white crime levels are substantially different (as they are) and polls indicate people believe differently; is that a sign of a reduction in racism or is it a sign of a lack of knowledge or reasoning ability among the population polled? Or is it perhaps just a fear of being labeled racist? I am not convinced that people's actions (such as flight to better school districts and refusal to go in the inner city areas after dark) agree with their answers on these polls.

Michael Levin, in *Why Race Matters; Race Differences and What They Mean* covers a lot of the same ground in terms of crime, poverty, test scores and other differences between blacks and whites in the United States. In fact, in several cases one wonders whether the Thernstroms had perhaps seen his manuscript in circulation. However, Levin differs greatly from the Thernstroms in that he readily accepts race differences in IQ, motivation, and behavior. In fact, a substantial portion of the book is devoted to an explanation of the evolutionary origins of such race differences.

Levin is a tenured professor of Philosophy at CUNY and the author of *Metaphysics and the Mind-Body Problem* and *Freedom and Feminism*, in addition to numerous essays and articles in both popular and scholastic publications. The latter book received a number of laudatory reviews

from a variety of publications including the Wall Street Journal. I suspect that the Wall Street Journal, like many others, will pass on this one. Some coals are just too hot to touch. Levin is perhaps best known as the professor who successfully sued his institution when they attempted to change his classroom assignments and otherwise pressure him because of the student furor created by some rather mild comments about race differences that he wrote for an obscure Australian journal.

Levin took a sabbatical to write the initial draft of *Why Race Matters* in 1992 and began looking for a publisher shortly thereafter. It was rejected over the years by many publishers. In the meantime, other books which have dealt with the race issue, such as Herrnstein and Murray's *The Bell Curve*, and J. Philippe Rushton's *Race, Evolution, and Behavior* took their heat, and went on to popular paperback editions with Afterword updates, while Levin's book languished in his computer files. Eventually an academic publisher, Praeger, picked it up for its *Human Evolution, Behavior, and Intelligence* series (edited by the educator and author, Seymour Itzkoff). The first small printing (June 1997) was quickly sold out and the second is now available. Reviews in several professional journals are forthcoming although the popular intellectual press has thus far ignored the book.

Part of the difficulty in finding a major publisher lay in the book's philosophical nature and its totally relentless assault on conventional racial wisdom. What is the ordinary book editor to think when confronted with sections entitled "Race differences in personal goodness", "Intensity of preference for other race victims" and "Race differences in free will" ?

An important facet of Levin's theories is that race differences have no moral significance in themselves, but are merely facts of nature.

Inspiring this theory is commitment to naturalism, the position that human values can be explained solely in term of preferences, reinforcements and selection for preferences and reinforcements without the assumption that anything in the universe is actually good or right. (The possibility of a value-free social science is one corollary of naturalism.)

Moral approval is merely a categorical reinforcement tendency by which a group makes clear the rules it wants its members to follow. To clarify further, a moral issue such as honesty benefits the individual and others to the extent that all are honest. In contrast, "the desire to get everyone to jog and reinforce jogging would be less a moral conviction than an obsession." Jogging only benefits the jogger, honesty benefits the other members of society besides just the person being honest. As one might expect, developing a naturalistic view of morality also involves other issues. For instance, morality might differ in different societies because of evolutionary differences in development. This does not mean that one society is necessarily better than the other, only that one is more beneficial in a given environment where it developed than the other might be.

The world seems to be divided into two groups in terms of acceptance of innate racial differences in physical and intellectual qualities: First, those who insist that we are all basically identical and race is an arbitrary and unnecessary concept. Second, those who think we may or actually do differ physically and intellectually as groups. They in turn can be broken down into two additional groups. The first, the overwhelming majority I would say, believes that while racial groups may differ intellectually and physically in the mean level of their characteristics, this information is meaningless in terms of social or political implications - in other words an attitude of, "so what?" That phrase, not coincidentally, is the title of Levin's first chapter - which

seeks to answer the 'so what?' question. It argues that race differences, far from being neutral, undermine almost everything that has been said about race for the past 60 years, and the many policies based on this conventional wisdom. Much is now known about racial variation, but it remains to put this knowledge in a broad philosophical perspective. That is what I have attempted to do.

A significant portion of the book is devoted to affirmative action issues that Levin sees as compensatory in nature and at the basis of most white guilt and black blame in contemporary America. Certainly race differences in this regard is not a "clean" topic and most "nice" people would just avoid it and hope it will go away. Fortunately, Professor Levin - being a philosopher - doesn't see his role as being "nice," but as finding truth.

The topic of racial variation is admittedly disturbing, and in an ideal world might be passed over in silence, but accusations against whites have made such discretion impossible. The right of the accused to present his case includes the right to raise issues that distress his accuser. A plaintiff demanding damages for a broken leg cannot ask at the same time that his leg not be talked about, nor take offense when the defendant presents evidence that the injury was congenital. By claiming harm he opens the question of why his leg is lame. Claiming racial harm has opened the topic of race differences.

He goes on to say, "[t]he basic argument for studying race differences is that racial outcomes are currently viewed through a lens of guilt and it is important to know whether this lens is distorting." The non-student of race or racial differences in America will be shocked and awed by the number of important issues on which race has a significant bearing.

An example is homelessness. The typical homeless person nationwide is usually male, either of low IQ or mentally ill; often both - and either a drug addict or alcoholic. Another factor seldom mentioned is that this male is usually black. As Levin notes,

[w]hite incompetents are commonly cared for, directly or indirectly, by their families, whereas illegitimate urban blacks usually have no families. The 20 year

old male unwilling or unable to sell his labor cannot be helped by an unmarried, unemployed 35-year-old mother with other children and possibly grandchildren. He comes to live in public areas surviving by begging and scavenging.

Levin goes on to blame this on the nature of black peer-bonding and a mismatch between black abilities and self-sufficiency in an urban environment. He has a strong opinion about the complicity of whites in the recent breakdown in contemporary standards, moral social and other.

Finally, although this would be difficult to document, whites appear increasingly averse to norms intended to apply to society as a whole, or just to themselves, lest they be 'racist' by implication....Now I suspect a major contributor of this sea change has been fear of offending blacks whose behavior often violates white...norms.

Levin deals with issues as basic as the existence of race itself, stereotypes, differences in intelligence, criticisms of IQ, Gould's "reification", temperament and motivation, differences in MMPI results, self-esteem issues, genes, gene environment correlation, environmentalism, heritability, race differences in time preference (concern for the future), and psychological race differences. If that weren't enough, he also discusses the history and uses of adoption studies, Head Start, malnutrition, athletic ability, race differences in Africans vs. African-Americans, the Flynn Effect, other minorities, biological determinism, reductionism, and racism.

Levin argues that because of their differing evolutionary development, blacks and whites differ in their concern for the future among other things. In Africa, where the weather was generally benign there was no need to develop a concern for the future, as there was in Europe and Asia with their harsh winters. This affected the development of moral attitudes toward reciprocity and cooperation. Where the future is of less concern there is a greater disregard of cooperation and reciprocity. Emphasis on the present and emphasis on the future are both rational given different evolutionary environments. The problems develop when the differing groups are exposed to each other and each expects the same automatic response from members of the other group that they get from members of their own group. As a result moral signals can become scrambled. Levin writes,

I conjecture that given levels of anger signal a less serious injury among blacks than whites, and that a positive feedback between black expressions of anger and white efforts to assuage it explains some otherwise puzzling aspects of race relations. White guilt and black intransigence may in part be effects of white misinterpretation of black reactivity and an overall mismatch between black emotional cues and white responses...Not having evolved to interpret black displays, whites tend to interpret black anger, including anger directed at them, as indicating the more serious injury such anger would signal from whites. As guilt and solicitude are evolved white responses to perceived injury, whites tend to

blame themselves for black rage and seek to ameliorate it.

Such differences must be accepted since they can't be changed, just as when evaluation of level of hostility in photographs of faces, women tend to see higher degrees than men.

Levin believes that the primary value of Western (or Caucasoid as he calls it) Civilization is the golden rule. Levin calls an individual Kantian (after Kant) "to the extent that he conforms himself to the golden rule."

Since the Kantian like everyone else wants to be able to rely on promises, he is trustworthy. The similarity between ideal Kantians and the ideal boy scout is not coincidental, since the boy scout code encapsulates Caucasoid morality.

In one of the most controversial areas of the book he argues that "the higher the mean IQ of a group, consequently, the more Kantian its morality is likely to be." Levin further argues that the difference between black and white male scores on the MMPI indicate that "Black males are likely to be further from the typical Caucasoid female's ideals of 'a good person' than ... a typical Caucasoid male." Levin's conclusion is bound to incite anger.

Since Kantianism is a principal Caucasoid measure of personal worth, it follows that, by ordinary Caucasoid standards, the average white is a better person than the average black. Assuming that the composite trait of Kantianism distributes roughly normally in both populations, a greater proportion of black than white behavior also falls below the ordinary threshold of decency, and of tolerability.

These statements sound monstrous, but they follow from data difficult to gainsay. Since intelligence correlates modestly but significantly with moral maturity and altruism, the race difference in intelligence by itself suggests a race difference in moral reasoning.

By such Caucasian standards of morality, the average Chinese or Japanese would also be a better person than the average white, since they score higher on intelligence tests. While Levin only addresses this briefly, it seems a reasonable corollary. On a somewhat softer note:

By definition, morality is the domain of universal rules. Groups have different moralities when they universalize different rules; different interest in rules per se is not a difference in morality, but a difference in concern with morality itself. Blacks may therefore be said to be on average less interested than whites in morality - not more immoral but more amoral. Blacks, like whites, have values, preferences revealed in behavior, but preference for conformity to the golden rule is not as strong an impulse for blacks as for whites. This does not make either whites or blacks better in the absolute sense.

Here Levin argues that since the existing race differences in achievement and attainment are a result of genetic factors, not white misdeeds, "this difference is not an injury, hence not an injury for which whites are to blame, hence not a condition whites are obliged to remedy." Contrary to Herrnstein and Murray, Levin argues strongly that genetic race differences are not a politically neutral issue, but of the utmost importance. Here he draws on Nozick's differentiation of forward-looking vs. backward-looking moral viewpoints. Recall the "broken leg" argument earlier. Since Levin's backward-looking view accepts that causation is genetic, the issues of harm, responsibility, rectification, and, one might add, white guilt, are all rejected. As a result, the reasons for affirmative action, which are always compensatory in nature, fall apart. Simple justice demands an end to it.

Levin would eliminate all anti-discrimination legislation. Given the high level of black crime, he would allow screening procedures in order to reduce it. As he notes, this would reduce crime against blacks as well as crimes against whites.

He differentiates between negative and positive racial discrimination. Positive discrimination is the attempt to harm due to race. Negative discrimination is the "race-based refusal to bestow benefits." He argues that negative discrimination is consistent with the golden rule. Levin develops an interesting argument that the opposition to negative discrimination has a lot to do with one's view of race differences.

But another reason this distinction is ill grasped where race is concerned may be the failure of blacks to produce on their own the sorts of goods common in white society. This inability of blacks to acquire Caucasoid goods without Caucasoid cooperation makes white refusal to deal with blacks appear to be a barrier - and a barrier is indeed harmful...But refusal to offset an inability is not a barrier...Africans centuries ago unaware of Europe were not harmed by the sheer existence of unavailable European goods. Nor would Africans have been harmed had they known about and wanted to trade for those goods, but were unable to inform Europe of their desire. It also follows...that Africans would not have been harmed had the Europeans who refused to deal lived on the same continent, or shared the same territory, as do blacks and whites in the United States. The proximity of someone with goods you do not have may sharpen your desire for them, but his refusal to slake your desire does not make you worse off.

Levin notes that much of the so-called malaise of contemporary America had developed since the Civil Rights Movement started. Regarding welfare he has some interesting comments for a libertarian. He says that welfare is too new for us to know its long term effects, but that such a safety net does appear at least feasible for whites.

The case appears otherwise for blacks, who are more inclined than whites to

regard public assistance as a legitimate means of support...One implication is that welfare would be unstable in an all-black population, and another may be that welfare for blacks, at 12% of the population, will eventually bankrupt an otherwise prosperous white society. It thus may be imprudent to offer blacks the same safety net that whites make available to each other.

In terms of the public school system he has a similar comment.

The "failure" of public schools - falling test scores, illiterate graduates, attacks on teachers, chaotic classrooms, physical decline - has only become a matter of great concern since the start of integration...As noted above, welfare became problematic only after becoming widely available to blacks. Perhaps certain institutions, like public education, are viable in a white population, but not in a black or mixed one, and conservatives have mistaken the unworkability of these institutions in mixed-race populations for inherent flaws.

In an afterword, Levin imagines a talk to the nation by the President of the United States, on solutions to its race relation problems, based on the ideas presented in the book. Here the President ends affirmative action and offers three plans for the future: minimizing race differences, laissez-faire, and controlling the negative aspects of race differences. The first, having been tried and failed, is rejected. Various methods of controlling the problems of black crime and unemployment are presented. Cooperation and support from the black community (especially black churches) is encouraged. Finally he suggests that a laissez-faire approach might be the most productive when linked with "realistic race blindness." Disparate impact is normal and to be expected, while racial classifications should be avoided.

Many religious persons are disturbed by Darwinism, but few people oppose open discussion of evolution. Loss of cherished illusions and abandonment of dreams is often the price of wisdom. The impossibility of our hopes is seen first as a crisis, then a chronic problem, then, finally, accepted as part of the human condition. So it will be with race.

Would that we could have a President so wise. But let us now look at four of the most pressing race problems in the U.S.: poverty, crime, education, and employment.

Since 1970 poverty rates for both blacks and whites have been pretty well stabilized at a fraction of their level in the early 20th century. According to the Thernstroms, affirmative action has made no appreciable difference in closing the black/white poverty gap. However, they argue that the structure of black poverty has changed substantially. In 1995 85% of poor black children lived in fatherless families. In 1959 this was a mere 29%. Today, of black women aged 15-45, a majority have never been married and by 1987 "the birth rate for married black women actually fell below the birth rate for unmarried black women, the first time this has ever happened for any

ethnic group. It was not a one-time anomaly; the pattern has continued ever since." One interesting fact uncovered by the Thernstroms is that "the vast majority of the adults who are poor today - and this includes black adults - are people who do not work for a living or only work part time." Of both black and white men (and white women) who were employed full time, less than 3% have incomes below the poverty line in 1995.

While the Thernstroms offer no real solutions for black poverty, they seem to feel largely that it is a result of the social structure that results in a huge number of single-parent families and also the welfare system, which discourages black women from marrying. They argue that "a typical black woman who marries loses benefits that amount to a 'marriage penalty' of almost \$1,900.00, almost 9% of her family income, twice the marriage penalty for whites." It seems doubtful though, that this penalty has much direct effect on the marriage rate. One wonders just how much black women of marriageable age are aware of this and would use it as a reason to avoid marriage?

The Thernstroms, like many neo-conservatives, blame the welfare system for much of the black social structure which they believe causes the poverty pathology they discuss. However, they fail to question why whites and blacks seem to respond differently to the same socio-economic policies. Levin addresses that directly:

On the other hand, while conservatives have made a strong case that welfare has accelerated black crime, poverty, and illegitimacy, they ignore the failure of whites to respond as blacks do to welfare incentives available to both races, and explain black failure in the post civil rights era as a legacy of slavery in language borrowed from the Left...The truism that a bad theory beats no theory may explain why the Right's account of race relations is seldom taken seriously.

What if contemporary urban black family structure is normal for the evolutionary background of blacks, not pathological? Anthropologist Patricia Draper has shown that contemporary urban black family structure is in many ways akin to traditional family structure over much of Southern Africa. Thus it may be, although few are willing to say it, that if traditional group norms are not forced on a differing population, is only natural to expect that their own norms will rise to the surface. It would be true regardless of the races involved. Of course, if one ignores evolution and biology like the Thernstroms and Andrew Hacker, than all this seems just foolish nonsense.

While the Thernstroms noted the huge difference in full time employment between white and black males, they offered no reason for this outcome. They note that William Julius Wilson's argument that it is blacks' lack of proximity to jobs that is the problem fails the test because other ethnic groups find jobs under similar constraints. Here Levin provides a possible answer. He argues that due to differences in the evolutionary habitat, Europeans and Asians have evolved longer time horizons. As a result, their level of concern for the future is entirely

different than that which is normal for blacks.

The Thernstroms argue that "there is no reason to assume that black criminals are going out of their way to prey on whites in particular. If African-Americans are seven times as likely to commit violent crimes as whites, and there are seven times as many whites as blacks available as victims, one would expect a disproportion of this order of magnitude." Of course this does not address the issue of racial isolation and/or economic incentive. There are not seven times as many whites readily available as victims - they are only available if blacks specifically go into white areas to find their victims. This could be because of a desire to damage whites or merely because the economics makes more sense - whites typically have more resources to steal than blacks do. The Thernstroms address the causes of crime and look at the usual arguments, poverty and swiftness of punishment. They find, as Levin does, that poverty has no real impact on crime and in many cases is inverse to the level of crime. They also find that while a speedy trial may be important, it is important only in a limited number of cases. All in all they find no real causes for the huge amount of black crime, but they paint a horrifying picture of the damage it has done to black communities.

Crime is the urban problem. It is the principal reason that so many people are fleeing from our largest cities. There remain upscale sections in almost every metropolis; apartment dwellers in the Upper East Side of Manhattan generally like where they live, and where they live is relatively safe. But it is literally the case that the revitalization of our central cities awaits a solution to the problem of crime. Urban advocates can demand federal dollars for enterprise zones and other such projects, but until the streets are safe, no store, factory, or theater is likely to flourish.

In looking at the issue of crime, Levin uses somewhat different figures. Blacks are 12 times as likely to commit robbery and 9 times as likely to have committed a murder as whites. He goes on to say that "Some criminologists use the rule of thumb that a black male is 10 times more likely than his white counterpart to be involved in homicide, rape, robbery and aggravated assault." The Thernstroms note that "crime is an individual failing, and the statistical generalization that blacks are disproportionately both perpetrators and victims must never obscure the vital fact that most black citizens are law-abiding."

That may be true if one includes females, but in some of our inner cities the sad fact is that the majority of males are not law abiding. Two recent reports have estimated that, in the District of Columbia 85% of black males will be arrested at least once in their lives. Levin argues, regarding interracial crime, that

blacks may be said to prefer white victims more than 2.6 times as intensely as whites prefer black victims. Informative as this ratio is it seriously understates the racial asymmetry because of the absolutely greater crime rates of blacks. Since the

average black is more than 2.5 times more likely to victimize a white than the average white is to victimize a black and 10 times more likely to have committed a crime, the average black is about 25 times more likely to have victimized a white than the average white is to have victimized a black.

Various estimates on inter-racial crime are that 80%-90% is black on white.

With their "individual failing" comment, the Thernstroms are clearly arguing that race is irrelevant to crime. Levin addresses that directly. He argues that even if the race and crime are causally independent (a view with which he does not agree),

the assumed causal independence of race and crime still leaves race its predictive value, and it is predictive value that warrants use of trait in screening. Traits are listed in suspect profiles because they carry information; why they carry information is a separate question.

While the Thernstroms address the issue of the causes of black crime, they seem to find few direct causes. Levin, at his most provocative, makes the comment that blacks are about the only group for which causes of crime are offered:

Lynching has had its causes as does everything in nature, yet an FBI investigation of a lynch mob is not called blaming the victim. Why isn't violent dislike of blacks excused, on the grounds of anger caused by black crime? Why isn't attention paid to the root causes of the holocaust? If some criminals are victims of the past why aren't all?

Special pleading about the causes of black crime suggest the belief that its causes partially justify or excuse it. And many people do think something (s) very like this: That, since black crime is the effect of past injustice, either the two wrongs cancel out, or else that past injuries done to blacks have left them unable to refrain from crime.

Levin then goes on to discuss a four basic root-cause hypothesis. He concludes that "[r]acism, poverty, low self-esteem and the 'circular culture of violence', offer less plausible explanations of black crime than do individual crime relevant-traits more prevalent among blacks." Of course the principal one is IQ. It has long been known that violent criminals tend to have an IQ about 9-11 points below average. Interestingly enough, the percentage differences between white and black youths that have appeared in juvenile courts can almost entirely be explained by IQ differences. He notes that most black criminals come from an "IQ range 75.7 to 91.1, with a mean of 83.4, and...white criminals from the range 72.5 to 87.7, nearly homologous bands containing 50% of the black population and 17% of the white." Levin adds "most of the difference in rates of black and white juvenile crime disappear when IQ is held constant."

Levin points out that black/white differences on the MMPI scales suggest greater criminal behavioral characteristics among black males and that black males and criminals tend to be more mesomorphic than the general population. Across races, mesomorphs "tend to 'unrestrained, impulsive self gratification' " Levin's final word is that the much higher rate of criminality among blacks than either whites or Asians is probably a result of "lower Kantianism, facilitated by lower intelligence and greater impulsivity themselves probably biological in origin." Finally Levin argues that probably race and crime are causally related. He opines that "mean black levels of intelligence and aggressivity appear to be joint adaptations to an African environment, so, while indications like skin color do not cause the behavior with which they associate, the association is not accidental."

The Thernstroms paint an equally dismal picture of skills, abilities and test results. However, there are still substantial differences in their treatment. They clearly believe that equalization is possible. They argue that "if the bar is raised, children work harder, and hard work is the road to success. It matters much more than any ability." Is this not the old neo-conservative lecture - "just behave like middle class whites and you will do just fine..."?

They address the issue of different learning styles raised by some black sociologists. In other words what is culturally appropriate for blacks may not be what is appropriate for whites. The Thernstroms feel this is nonsense. The latest study by Rowe and Cleveland (Intelligence, Nov.-Dec, 1996) favors their opinion. Blacks and whites seem to learn in the same way despite the objections of some Afro-Centrists.

They also raise another important issue: contrasting peer groups. They note that "Asians had far more close friends who valued academic success highly, while blacks did not. Blacks view doing well in school as 'acting white' and thus betraying one's race." This is certainly reflective of the findings of the Coleman Report in 1966. The nature of one's peer group had much more impact on one's scholastic attainments than any other factor they investigated, including funding, quality of teachers, schools etc. Of course the Coleman Report ignored issues of innate differences such as IQ, as do the Thernstroms. When these are added to the mix, even peer-group influence becomes relatively minor in comparison.

The Thernstroms report that "almost four of ten African-Americans have federal grants to defray college costs, in double the proportion among whites." Nevertheless they offer no real reasons for the huge differences in graduation rates, skills, abilities, and test results between the races. They seem to think that if only we make it tough enough for everybody then somehow blacks and whites will come out pretty well the same.

Levin addresses the issue of education somewhat differently. While mentioning some of the dismal statistics discussed by the Thernstroms, Levin is much more interested in why the vast gulf between white and black performance. He compares education with professional sports.

Blacks were generally excluded from professional sports until the 1940's. When the opportunity was provided, black talent in sports allowed them to rise rapidly. Today over 2/3 of the National Football League's players are black. The figure is an even more astounding 90%+ for the National Basketball Association. This is a pretty amazing achievement for a group that is only about 12% of the population, and it may even exceed the comparable success of Jews and Asians in our institutions of higher education. Little money is spent to encourage black participation in these sports, yet blacks dominate them. The opposite is true in education. Here vast sums have been spent with little to show for it.

Since 1972, the National Institute of Health and the National Science Foundation have spent 2 billion dollars to increase black representation in scientific fields. Blacks are enrolled in medical schools with much lower MCAT than allowed for whites and the overwhelming majority of these blacks receive scholarships. Head Start, despite its ineffectiveness for young blacks, has cost hundreds of billions of dollars. Despite these programs and many others there has been little change since the 1970's. Levin points out that it is hard to argue that the relative weakness of blacks in education is due to a lack of opportunity. IQ differences seem to account for almost all, if not all, of the differences in education.

Concerning SAT scores, the Thernstroms provide some data from the latest 1995 tests. These, no more than the 1992 data previously offered by Andrew Hacker, provide little to indicate that socio-economic status differences for the races have much to do with SAT scores. The SAT scores of children from highly impoverished white families earning less than \$10,000 a year exceed those of children from black families earning over \$70,000 a year. Despite this, the Thernstroms still reject the significance of IQ in America's race problem. They note that there is abundant evidence that SAT scores are excellent predictors of college performance for blacks, though there is some difference here from whites. They quote Robert Kiltgard (Choosing Elites), as stating "One might wish that standardized tests underestimated the later performance of blacks..." Nevertheless, he found "at elite institutions 'black students' typically do worse than 'whites with the same test scores, perhaps one to two thirds of the standard deviation worse.' Kiltgard estimates that to make the prediction of black college grades precisely correct it is necessary to subtract 240 points on the combined SAT. Among black and white students with the same high school grades, blacks will perform as well in college as whites with a SAT score that is 240 lower."

The Thernstroms note that there has been little change in the relative wages of black versus white men since the early 1970's. They have lots of interesting data about the effect, or lack of effect, of affirmative action on black employment. However, it is curious that they do not once mention the pioneering work of Linda Gottfredson on black employment.

Levin summarizes Gottfredson's work, originally published in the Journal of Vocational Behavior in 1986 and 1988. Using the US Department of Labor IQ estimates for various job descriptions from meat cutter to physician, Gottfredson demonstrates that blacks are more

numerous in higher IQ level positions that their IQ would allow based on population size. Instead of discrimination against blacks in these areas there appears to have been discrimination in favor of blacks. Since the Thernstroms do not consider IQ valuable, they fail to report this dramatic statistic.

Probably the major differences between these two new books can be ascribed to the difference between a universalist-environmentalist-egalitarian outlook and a Darwinian outlook. The first optimistically ignores differences or tries to and assumes that any that may exist will disappear eventually given a little time and tolerance; the second assumes differences and expects these differences to persist. The universalist calls the Darwinian names (racist, biological determinist, etc.) for considering differences, while the Darwinian suggests that optimistic universalism has nothing to offer other than description.

While the Thernstroms blame blacks for black failure, Levin wonders if black failure really is failure, from an evolutionary standpoint. Dinesh D'Souza in *The End of Racism* argues strongly that the causes of contemporary black failure are largely the result of black pathology. Levin says this may "just be a way of saying that these behaviors are maladaptive in the contemporary American environment." But are they? He goes on to point out that from the Darwinian standpoint a behavior is pathological only if it reduces reproductive success.

In the contemporary United States, black fertility is substantially higher than white fertility. Levin argues

33% of all black children (and their mothers) are now supported almost entirely by the resources of genetically unrelated whites in the form of public assistance, rather than by their biological parents. Black success at inducing whites to divert resources from their own children to the children of unrelated blacks is successful exploitation of the environment rarely matched in nature...at the moment black norms are highly adaptive.

Levin accuses the pathology believers of a patronizing attitude towards black behavior. For example if groups differ, the evolutionary origins of group behavior might differ. The behavior that is disapproved of may well be valuable in the context of that group's social relationships

[T]he male gang appears to be an important element of black society, making aggressive physical display, which helps determine rank in loose male hierarchy, black-pro-social. The same oppositional defiant body language is disruptive in white society in whose crowded cities constant physical challenge is intolerable, and where hierarchical status is determined by more symbolic displays of dominance/aggression.

Theories about race relations in the United States must be measured by their ability to explain,

plausibly, the black enigma: how it is that blacks came to fail precisely when they ought to have succeeded. Pinning the blame on white racism, ala Andrew Hacker, is unreasonable and unacceptable, and the Thernstroms have provided the definitive refutation of this position. But the Thernstroms' account of black progress stumbles over glaring black failures that cannot be wished away, especially the continued status of blacks as a cognitive underclass. The Thernstroms leave these failures wholly unexplained, apart from a vague sense that something to do with motivation or expectation is lacking. Levin, however, grasps the nettle with both hands, producing a full-fledged theory of black underachievement, which, if correct, unravels the conundrum: America has a racial problem because races are real, races are different, and race matters.

In his 1994 book, *Alien Nation*, English émigré Peter Brimelow argues that, for the United States, race is destiny. Maybe Brimelow is right. As one US newspaper editor has remarked - "without race, we wouldn't have much of importance to talk about."

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The Reality of Race - A Summary of John R. Baker's book: "Race"

by Thomas Jackson

From American Renaissance magazine November, 1993

"Race is a veritable mountain of evidence, all of which can lead only to the conclusion that the races differ in ability. Nevertheless, Dr. Baker is strictly the scientist. He draws no further conclusions and makes no suggestions about social policy. There is no doubt in his mind that current orthodoxy on this subject is absurd, but he limits his exegesis to the interpretation of data."

John R. Baker, *Race*, Foundation for Human Understanding (original publisher: Oxford Univ. Press), 1974

- * Introduction
- * The Proper Study of Mankind
- * Race and Color
- * Equal or Unequal?
- * A Mountain of Evidence

Race, by John Baker, is a remarkable book. There is probably no other treatment of the biology and physical anthropology of race that approaches it in breadth, detail, erudition or style. Even more remarkable is the book's point of view. Far from evading the issue of racial differences in ability, it was written for the very purpose of investigating and clarifying those differences.

Dr. Baker, now deceased, was the ideal author for this book. He was professor emeritus of cytology at Oxford University, a Fellow of the Royal Society, and president of the Royal Microscopical Society. To these professional qualifications he added an abiding interest in what he called the "ethnic question," that is to say, the entire range of ways in which the races differ.

Written late in life, *Race* is Dr. Baker's definitive statement on what he considered one of the most important issues of our time. From start to finish the book is stuffed with little-known, eye-opening facts, and it is fascinating, even essential reading for anyone with a serious interest in race. It is supplemented with more than 80 illustrations, and some of the simpler line drawings

are reproduced here.

Race is organized in four parts. The first is a summary of what was thought and freely written about racial differences up through the end of the 1920s when, as Dr. Baker puts it, "the curtain came down" on open discussion. The second is an introduction to the biology of taxonomy or classification, including a thorough treatment of how races and species are identified. The third is a detailed inventory of the biological differences that distinguish the major races and subraces. In this section Dr. Baker makes a particular study of whites, or Europids as he calls them, and of Africans (Negrids), Bushmen (Sanids), Australian aborigines (Australids), Celts, and Jews. In the final section, Dr. Baker sets out what he considers to be the essential criteria for determining what he bluntly calls superiority and inferiority. Not surprisingly, his conclusions are at odds with current dogma.

Dr. Baker's historical account of what has been written about ethnic differences includes introductions to a number of people one might well expect, such as the Comte de Gobineau, Houston Stewart Chamberlain, Nietzsche, Francis Galton, and even Hitler. Dr. Baker also describes the pioneering but no longer recognized work of men like Johann Blumenbach (1752-1840) and Samuel Sommerring (1755-1830).

Other famous men have pronounced themselves on the question of racial differences and, until recently, few have had any sympathy for the notion of equality. Rousseau, for example, thought the chimpanzee was a primitive form of human being, and Kant, Voltaire, and Hume thought the Negro vastly inferior to the European. Dr. Baker reminds us that even the Bible is hardly silent on the ethnic problem. The Children of Israel routinely exterminated enemies, whom they considered inferior, and in the tenth book of Joshua, they enslaved the entire Hivite people.

The Proper Study of Mankind

In the more technical sections that follow, Dr. Baker draws on his scientific training to treat homo sapiens as just one more member of the animal kingdom. "No one knows man who knows only man," he observes, and adds: "One might almost go so far as to say, in relation to the ethnic problem, that the proper study of mankind is animals." By this he means that without a thorough grounding in biology and taxonomy it is impossible to view man with the detachment that science requires. Dr. Baker writes, he explains, in the spirit that inspired T.H. Huxley to conclude that "Anthropology is a section of zoology [and] . . . the problems of ethnology are simply those which are presented to the zoologist by every widely distributed animal he studies." In this, Dr. Baker is out of step with many contemporary social scientists who seem to believe that humans are uniquely exempt from the laws of heredity and from the kind of scrutiny to which all other animals are subject.

Dr. Baker leads us firmly back to biology with an account of how evolution gave rise to different species, how species are classified, the nature of hybridity, and the circumstances

under which animals can be made to mate with differing species. Anthropology indeed becomes a branch of zoology. However, in this discussion it becomes clear that man differs from animals in at least one important way: humans are exceedingly unselective in their mating habits and will copulate with individuals--across racial lines, for example--from whom they are physically very different.

The contrast with the seven kinds of European mosquito, for example, could not be greater. Their eggs can be distinguished because of slight differences, but adults are so similar that not even experts can tell them apart under a microscope. What experts cannot do, the mosquitoes do without fail; they never interbreed.

Dr. Baker likewise reports that Grant's gazelle and Thompson's gazelle live together in mixed herds and are so similar in appearance that it takes a trained eye to tell them apart. They, too, never interbreed. It is only under domestication that animals can be made to overcome their repugnance for mates unlike themselves and thus produce mules or leopons (a cross between tiger and leopard). Domesticated dogs breed indiscriminately with widely different types but wild dogs like wolves, foxes, and coyotes breed only with their own kind.

Man is the most domesticated of animals and the least exclusive in his amours--but his promiscuity varies enormously by group and individual. As Dr. Baker points out, the Indian caste system successfully prevented interbreeding even among racially similar people. At the same time, there are individuals whose lust for animals is so great that bestiality has had to be specifically forbidden ever since Biblical times.

The races and sub-races of man have evolved largely because of geographical separation, but Dr. Baker also refers to what he calls "ecological races" that evolved to fill different but overlapping niches. The small stature of African pygmies, for example, fits them to forest life while the larger Negrids live in clearings.

If humans had continued to evolve in isolation or if they were as discriminating as animals in their choice of mates, racial differences would eventually lead to mutually infertile species. This would be diversity of a truly remarkable kind.

Domestication and travel have led to increasing miscegenation, but Dr. Baker speculates about another possible reason. The skulls of our remote ancestors show that their olfactory organs were much better developed than ours. It is also likely that ancient man had stronger odors than does modern man, and since our ancestors' mating habits were probably governed by smell just like those of animals, this discouraged mating with unfamiliar peoples. Even today the races have different odors.

Dr. Baker notes drily that although modern man is scrupulous in selecting only the most promising breeding couples among his domestic animals, he almost never gives the same

attention to his own reproduction. "It follows," he adds, "that we cannot look for any advance in inborn intelligence"

Race and Color

Dr. Baker writes at some length about skin color, but only because race and color are sometimes confused. He himself thinks the subject is trivial and, in fact, since at least Darwin's time scientists have recognized that color is unimportant in distinguishing biological forms. Dr. Baker points out that to make color the touch stone of race is as stupid as to think that a red rose is more closely related to a red petunia than to a white rose.

Australian aborigines are similar in color to Bushmen, for example, but it would be difficult to think of two racial groups that are more dissimilar biologically. Likewise, Dr. Baker explains that some of the inhabitants of northern India have relatively dark skin but are racially very close to Europids.

Skin color is affected by the color of blood that may be visible through it, but the main reason for variations in skin color is the presence of different amounts of the pigment melanin. All humans make the same melanin and have much the same number of melanocytes--the difference is in how much melanin is produced. The darkest Africans have visible concentrations of melanin even in the whites of their eyes and on their tongues. Melanin colors hair as well as skin, though it is the presence of a slightly different substance, called phaeomelanin, that causes "red" hair.

Dr. Baker explains that blue eyes are not caused by a blue pigment but by the absence of pigment. Eyes appear to be blue for the same reason the edges of a snow bank may appear blue: red light and other long wave lengths pass through but shorter, bluer wave lengths are refracted and scattered, and some are reflected back towards the viewer.

Light-skinned people are probably descended from dark-skinned people who migrated from the tropics. The skin of Europeans transmits three and a half times as much sunlight as the skin of Africans, and the ultraviolet rays convert ergosterol in the body into vitamin D. Dark-skinned people, whose skins are adapted to sunnier latitudes, may therefore get rickets--caused by vitamin D deficiency--if they live in cold climates.

The third section of *Race*, in which Dr. Baker describes the myriad ways in which the races differ from each other physically is the most technical. It includes general descriptions of blood chemistry, physiology and skeletal structure, with a special emphasis on the characteristics of the skull. It introduces concepts like brachycephaly, paedomorphism, and the cranial index.

It is useful for the reader to have had some training in physiology but it is not necessary. Even the most technical passages can usually be understood by a non-specialist who has paid close

attention to earlier explanations, and Dr. Baker has set his most abstruse observations in smaller type as a signal to laymen that they may skip over them without much loss.

A certain level of scientific detail is necessary here not merely because physiological differences between the races require a certain vocabulary. In this section Dr. Baker is at pains to explain the extent to which some races show the traits of primitiveness--the retention into the modern era of features possessed by our remote ancestors--and pedomorphy--the retention as adults of traits commonly associated with children.

For example, it is indisputable that Australids are more primitive than other races. Like Pithecanthropus, their teeth and lower jaws are strikingly large, and their skulls are twice as thick as those of any other race. The forehead recedes sharply, and the brow ridges are so well developed as to be reminiscent of Pithecanthropus and of the larger apes. The brain is only about 85 percent the size of that of Europids and the back part has lunate folds not found in other races but similar to those in the brains of orang-utans. Likewise, the nasal aperture is similar, in some respects, to that of the orang-utan.

The Bushmen, or Sanids, show equally remarkable evidence of pedomorphy. Their very small size--males are often no taller than 4'7" or 4'9"--is the most obviously juvenile characteristic retained by adults. Their skulls are notably short and squat like those of a Europid infant and their eyes are set wide apart like a new-born's. The facial and body hair of both sexes is very weakly developed and reminiscent of children. Among males, the scrotum is like that of a pre-adolescent: so small and tightly drawn up that one might think only one testicle had descended.

As for Negrids, aside from a brain that is very slightly smaller than that of Europids and Sinids (North Asians), Dr. Baker finds no characteristics that could be called either primitive or pedomorphous. Negrids differ in blood chemistry from other races, and have broader shoulders and thinner calves. Certain tribes, such as the Hottentot, show extreme steatopygia or enlarged buttocks. In some cases the posterior extends horizontally, almost like a shelf.

Francis Galton, who travelled among the Hottentot in 1850 and 1851, wrote of one such woman that he was "perfectly aghast at her development." He wanted to measure her dimensions but could not bring himself to ask her permission to do so. Instead, he took observations through his sextant and, he says, "worked out the results by trigonometry and logarithms."

Equal or Unequal?

The question of whether Africans are, on average, equal in intelligence to whites is important both in the United States and in Britain. Dr. Baker therefore devotes considerable space to 19th-century accounts of African societies before they came into sustained contact with foreigners. This is the only sure way to know how far they had been able to advance without outside influence.

Every explorer found a remarkable poverty of development. No black African society had a written language or a calendar. None used the wheel or practiced joinery or built multi-story buildings. Iron smelting was common but no black Africans built what could be called a mechanical device, even one so simple as a hinge. Africans apparently tamed no animals themselves but received already-domesticated dogs and cattle from north of the Sahara. None used any beast of burden, despite the presence of large mammals that could have been tamed.

Although African societies are today described as having rich oral histories, this was by no means universal. A few tribes did have men who could recite the histories of their kings, but many were completely ignorant of the past. The Ovaherero tribe, for example, kept no count of years at all.

Slavery and polygamy were widespread. Arbitrary execution of subjects by rulers or wives by husbands was common. A few tribes ate human flesh though even some of their own members seem to have rejected this custom. Some coastal natives, seeing slaves being fed before being loaded onto ships for export, believed that Europeans intended to eat them.

Some people have argued that the reason Africans showed such poor development was that the effort to maintain life was too great to permit the leisure for advancement. On the contrary, the missionary and explorer, David Livingstone, found that some parts of the continent were a veritable paradise:

"To one who has observed the hard toil of the poor in old civilized countries, the state in which the inhabitants here live is one of glorious ease. . . . Food abounds, and very little labour is required for its cultivation; the soil is so rich that no manure is required."

Although Dr. Baker does not pursue this idea very far, he suggests that it was the very ease of life in Africa that kept high intelligence from being as necessary for survival as it was in harsher climates.

In the concluding section of *Race*, Dr. Baker draws the only conclusions that the data will permit: Just as they differ in biology, the races differ in their mental traits. They are not equally intelligent or capable of building civilized societies. Dr. Baker reviews the literature on mental testing and on the heritability of intelligence and finds that it only confirms his conclusions.

After setting out an interesting set of criteria for genuine civilization he finds that the first people to achieve it were the Sumerians of the fourth millennium B.C. Physically, it is likely that they were more closely related to the Kurds than to any other present people. Europids and Sinids have also created genuine civilizations, but Negrids and Australids have not.

Dr. Baker puts the Maya of Central America in a category of their own. Their astronomy and mathematics were extremely advanced and were at one time the most sophisticated in the world. They built great cities and administered large territories. However, Dr. Baker hesitates to call them genuinely civilized for several reasons: they did not use the wheel or use commercial weights, their written language was poorly developed and their religion was a mass of superstitions that were often the basis for torture, human sacrifice, and mass slaughter.

A Mountain of Evidence

Race is a veritable mountain of evidence, all of which can lead only to the conclusion that the races differ in ability. Nevertheless, Dr. Baker is strictly the scientist. He draws no further conclusions and makes no suggestions about social policy. There is no doubt in his mind that current orthodoxy on this subject is absurd, but he limits his exegesis to the interpretation of data.

In its realm, however, *Race* is a magisterial work to which justice cannot be done in a review. It is probably the single most ambitious and comprehensive volume on the subject ever attempted, and is surely without peer in its treatment of the physical differences that distinguish races. It is not an easy book -- Dr. Baker does not address himself to dullards or dilettantes -- but in these blighted times it is a stroke of astonishing good fortune that a man of his immense learning and ability should have chosen to take up a position on the unpopular but truthful side of "the ethnic problem."

Virtue in "Racism" ?

Raymond B. Cattell

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At a time when racism is a widely discussed issue, it behooves us to look at it more broadly than as an issue in affirmative action.

Geneticists in the last decade have formulated a view of the animal kingdom that describes what they call "altruism" an inverse function of the genetic distance between the interacting individuals or species. That is to say, individuals are indifferent or hostile to others in proportion to their genetic unlikeness.

Recently support has come to this generalization from an unexpected quarter. Research on heredity by the new MAVA method permits a calculation of the interaction of heredity and environmental influences that is not possible by the older twin method. The remarkable finding is that for every trait measured in humans the correlation is negative between the heredity and the environmental pressure. That is to say, individuals who deviate from the average most strongly on the genetic component are pushed toward the mean by environment. This is shown in Table 1.

The relation may be illustrated by the ordinary intelligence test measurement - crystallized intelligence in Table 1. Here within the family i.e. among siblings, there is a correlation of $-.52$, suggesting that the duller members are more pressed on and the brighter members neglected. However, the greater effect ($-.81$) is between families. That is to say, the average of the children in a genetically dull family are strongly pressured, e.g., by Head Start, toward the mean, while the average of the bright family is either left untouched or pushed toward the mean. This is true of crystallized intelligence, which is possibly 50-70% environmentally determined, versus 20% for fluid intelligence. These between-family values are the best indication of what is going on in society as a whole, for they indicate the general effect of society upon the family units.

TABLE 1

Genothrepic Correlations (Data from Cattell, 1982, pp. 330-376)

From Questionnaire Measures of Factors

By overlapping simultaneous equation solutions (OSES)

16 PF Factors	Within Families	Between Families
Ego Strength, C	-09	-78
Dominance, E	-33	-90
Surgency, F	-30	-92
Super Ego Strength, G	26	-1.00
Parmia, H	-23	-91
Premsia, I	-44	-70
Guilt, O	-17	-92
Self-Sufficiency, Q2	-35	-89
Self-Sentiment, Q3	-26	-95
Tenseness, Q	-37	-93
Mean Value from Objective test Battery(Secondaries in Q-Data) (From Least Squares Method)	-24	-58
U.I.16	-92	-93
U.I.17	-39	1.0
U.I.19	-17	-86
U.I.21	59	-95
U.I.23	06	-79
U.I.24	02	-58
U.I.25	-44	-20
U.I.26	-41	-90
U.I.28	-42	-90
U.I.32	-40	-93
U.I.33	-81	-96
Fluid Intelligence, gr	-.59	-59
Crystallized Intelligence, gc	-.52	-81

These “genothreptic” findings are very recent and it remains for social psychologists to develop theories of why this “coercion to the bio-social mean” occurs. A critic of TV has suggested that since advertising is directed to the largest numbers, the intellectual level of “carrier shows” caters for the average. It stimulates the dull and leaves the bright bored. The effect can even be seen in the classroom where the busy teacher presses attention on the backward 'to catch up' and necessarily leaves the bright undirected.

The coercion to the mean effect has long been noted by observant writers. Voltaire remarked that the impact of a true genius could always be verified by the fact that all the mediocrities gang up against him. We are used to the genius living in an attic and the incompetent being supported and cared for by community welfare.

Society loves its average. It is an instinctive reaction which preserves the species intact. However, it also plays a part in the generation of new species. When a whole subgroup - by genetic drift or unusual environmental selection - begins to break off, the unity and special character of the newly emergent group are preserved by coercion to its mean - with inter-breeding of the main group deviators. Perhaps something like this explains the development of Cro-magnon man, despite being surrounded in the same geographic regions by Neanderthals.

All this bespeaks the existence of an innate racialism as an evolutionary force - a tendency to like the like and distrust the different. As an instinct it may not be as strong as the primary instincts of sex, fear, hunger, etc.; but we have every reason to posit its existence. Just as civilized society has constantly to battle an innate sex drive, so the evidence that it has had to battle racism is sufficient evidence that an innate drive exists.

Modern society has pronounced its ethical condemnation of racism, but in the long run has met with little more success than in religion and in its condemnation of sex and aggression. It is time to recognize clearly that race-consciousness is a natural tendency, with which our socio-political life must come to terms.

One way is to avoid too great a diversity within a politically organized society. Contemporary societies made up of a mosaic of ethnic components have potential advantages. For example, social experiments can be tried out in one subgroup and, if successful, adopted by all. Something of this kind exists in the degree of independence of the fifty American states. But, as in current Yugoslavia, perhaps the mosaic can go too far and lead to conflict.

This is a matter for investigation, which will remain uninvestigated until social psychologists wake up to the existence of a natural, innate racism. Like all instinctive forces, it has its virtues and its vices. There are situations in which it can advantageously be cultivated, and others where it is a source of trouble. But even when, in the latter circumstances, it appears necessary

to suppress it, we should recognize the consequences of suppressing innate drives and the need to respect what is, in other circumstances, a virtuous gift. It was such in the Second World War, when it gave tremendous power to the anti-Nazi attack. It plays an unspoken part, among most Africans, in the attitude of the public to the Negro and the Hispanic. It is time for social scientists openly to recognize it as something other than a perversion, to measure it, and to understand how best to shape society to adjust to it.

Race, Evolution, and Behavior Summary - by Glayde Whitney

Race, Evolution, and Behavior: A Life History Perspective

by J. Philippe Rushton

New Brunswick NJ: Transaction Publishers, 1995, 334 pp.

Reviewed by FSU Professor Glayde Whitney

in Contemporary Psychology, December 1996, pp. 1189-1191.

The Return of Racial Science

- * The Theory
- * The History
- * The Reception
- * The Pity
- * References

If the mavens of Politically Correct could enforce an Index Librorum Prohibitorum, then you would not be allowed to read this book. Serious scientific considerations of similarities and differences among the living races of humankind have been in eclipse for most of a century. With *Race, Evolution and Behavior* author Rushton goes a good distance toward reinstating objective scientific rationality to this important and sensitive area of investigation. Here within a single cover are considered topics of race with regard to intelligence, aggression and criminality, sexual behavior, parenting behaviors, personality, rates of maturation, sexually transmitted diseases, social stability, brain size, differential rates of twinning, pharmaceutical reactions, and much more, along with genes and evolution. Rushton reports that for over 60 variables he has found the same pattern among races: "people of east Asian ancestry (Mongoloids, Orientals) and people of African ancestry (Negroids, blacks) define opposite ends of the spectrum with people of European ancestry (Caucasoids, whites) falling intermediately,"

(p xiii). Although there is much variability among individuals within each broad racial category, the average differences between them are consistent in direction across diverse physical, behavioral, and social variables.

The Theory

To theoretically account for the consistent pattern of differences across races for so many disparate variables requires a high-level, broad conceptual framework. Rushton proposes a "gene-based evolutionary theory" that utilizes concepts from population biology. The r - K scale of reproductive strategy has been widely used in many sociobiological applications. The symbol "r" initially denoted "intrinsic rate of increase", while "K" is the symbol for "carrying capacity of the environment" (MacArthur and Wilson, 1967). The individuals of populations which have been r-selected tend to mature rapidly and reproduce at a young age. The emphasis is on maximization of number of offspring with less resources devoted to the care of each individual offspring. The species which are r-selected often exist at population densities that are well below the theoretical carrying capacity of their environment; they experience high rates of death due to unpredictable causes (disease, local famine). The r evolutionary strategy has been to throw out lots of kids in the likelihood that some might survive in a capricious world.

Individuals which are K strategists tend to live in more predictable environments and they mature more slowly. Rather than high rates of reproduction, there is delayed reproduction and considerable resources are devoted to caring for the smaller number of offspring which are produced. The K evolutionary strategy has been to produce far fewer kids and to carefully nurture each one through the most difficult times in a predictable world (think winter blizzard). K-selected species tend to have more stable and complex social structure than do r-selected species.

In order to emphasize that all humans tend to be K-selected in comparison to many other species, Rushton has referred to his theory as "Differential K Theory". Essentially, the proposal is that African populations, evolving with a tropical abundance of both food and diseases, are relatively less K-selected. Relative that is, to Mongoloid populations which were more K-selected in the harsh environments encountered during the last Glacial epoch, or which are experienced today in cold climates. There is a positive Darwinian selective advantage favoring more forward planning, sexual restraint, parental nurturing, family stability, and social structure in order to successfully raise children across hard cold winters.

The History

On many of the variables that are considered, the racial differences are not large and Rushton emphasizes "the indisputable fact that much more research is needed. Objective hypothesis testing about racial differences in behavior has been much neglected over the past 60 years and knowledge is not as advanced as it ought to be" (p. xv). In view of the near taboo on race as a

causal variable in the social sciences, it is interesting to consider how much do we know and since when have we known it. The answers to these two questions, as given in the chapter "race and racism in history", as well as throughout the book, will likely surprise many psychologists and social scientists educated in the last 60 years. We knew a lot about race differences and we knew it prior to the early decades of the twentieth century.

Indeed, some of the race differences only now being investigated (re-investigated) have been known and have been stable with regard to direction of average differences since the first recorded contacts among the races. One example is the case of brain size. Well known to Broca and other 19th century scientists, then lost in a fog of misspeak and obfuscation and only now reemerging as a stable and potentially important difference between races. The context of progressive, socialistic, or communistic environmentalist-egalitarianism in which the study of race differences went from being respectable science to ideologically suppressed evil is a fascinating study in itself (Degler, 1991; Pearson, 1991). The widespread abhorrence of wartime excesses fed a mid-century frenzied denial of the legitimacy of racial science from which we are just now emerging. It is in large part this history of denial and demonization which marks Rushton's book as a landmark volume.

The Reception

It will come as no surprise to learn that Rushton's work, although well written and very readable, has not been greeted with universal acclamation. Indeed. He has probably suffered as much controversy and abuse stemming from his professional activity as any modern psychologist in the "free world". Following a 1989 invited presentation of Differential K Theory at a meeting of the American Association for the Advancement of Science, a firestorm of controversy arose. Although not widely reported in the United States, an academic, governmental, and media circus played out in Canada. The Premier of Ontario (analogous to a state governor) called for the University to fire him. The Premier also asked the Ontario Provincial Police to investigate whether he had violated the federal criminal code of Canada. A leading Toronto newspaper kept a steady stream of scurrilous editorials flowing until threatened with a lawsuit, upon which they desisted. Canadian television news programs propagandized and demonized Rushton's appearance with the insertion of Nazi film clips, as did Connie Chung of CBS's "eye-to-eye" infamy.

On the academic front the institution of tenure saved Rushton's position at University, but not without cost. His annual performance rating suddenly went to "unsatisfactory" (as at most places a first step in laying the paper trail to eventual dismissal) until legally challenged, at which point his rating, as one of the most prolific researchers in his unit, went back to the customary high level.

One of the most ignominious events involved a covey of influential members of the Behavior Genetics Association (BGA). Because of their field of research, investigators of behavior

genetics (even mousers and fruit fly devotees) have not been immune from Nazi name-calling and attacks on their academic credibility. Accordingly, the BGA had long established a "public and professional affairs committee" to issue the occasional "official statement" in support of attacked members. In a totally unprecedented turn-about that committee was requested to disavow, on behalf of the BGA, the member-in-good-standing Rushton and his research. When the committee refused, the afore mentioned covey took it upon themselves to circulate widely a statement throwing Rushton to the wolves. None of the attacks involved data or rational theory. Rather they were emotional attacks on Rushton's "repugnant" insensitivity.

In the face of tenure protection, a move was instigated to criminalize Rushton because of his research. In what has been called "the worst attack on freedom of speech ever perpetrated in Ontario", the Ontario Human Rights Commission investigated for four years and then unceremoniously dropped the case (Leishman, 1995).

It is not just the political left that has trouble acknowledging the legitimacy and importance of racial science. Irving Horowitz (1995), Rushton's publisher, has written an interesting account of the refusal of a leading conservative publication to accept paid advertisements which announced the availability of *Race, Evolution, and Behavior*.

The Pity

More is the pity of these emotional rejections of racial science, since it is often members of the "protected groups" which suffer because of ideologically enforced politically correct ignorance. As an example, it has been quite unacceptable to discuss race differences in testosterone levels, although this taboo is crumbling since it was noted that the hormone difference might be causal to the substantial race difference in mortality due to prostate cancer. In the U.S. the epidemic of murders of young black males by young black males has reached such levels that even the most ideologically committed can no longer deny reality.

The remarkable resistance to racial science in our times has led to comparisons with the Inquisition of Rome active during the Renaissance. It is probably not the case that Pope Paul V and Cardinal Bellarmine were evil men. They were quite well educated for their time and probably sincerely concerned for the welfare of their society. Their duty was to prevent the destruction of society that must surely follow if the heresies were allowed. Now the Copernican heliocentric theory could be tolerated; it was after all only a theory and Copernicus was dead. Kepler's mathematical calculations could be tolerated; they were after all quite mathematical and not likely to arouse the curiosity of the common man. But Galileo Galilei went too far. He said it was true. Come, look through his telescope. Not just a theory but real observable data. Not in the past but here and now. Truth from which who knew what evil might follow. Galileo Galilei was arrested and forced to recant. Astronomy and the physical sciences had their Copernicus, Kepler, and Galileo a few centuries ago; society and the welfare of humanity is the better for it today. In a directly analogous fashion, Psychology and the social sciences have

today their Darwin, Galton, and Rushton. Discipulus est prioris posterior dies [Publius Syrus].

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Race, Evolution, and Behavior Summary - by Mark Snyderman

Race, Evolution, and Behavior: A Life History Perspective

by Mark Snyderman

from National Review, Sept 12, 1994

WHAT MUST Pat Shipman think of Phillippe Rushton? Dr. Shipman describes how the scientific study of racial difference has too often been polluted by political forces; she proclaims her allegiance to science, and declares that we are better off knowing the unaltered truth about racial differences. But her rhetoric betrays great fear of what science may reveal.

Phillippe Rushton apparently has no such fear. Although his story is absent from Dr. Shipman's book, it would fit neatly. Mr. Rushton, a professor of psychology at the University of Western Ontario, has endured excoriation because he has dared to posit an evolutionary/genetic explanation for racial differences in a wide variety of physical and behavioral characteristics. Undeterred, he has even appeared on Geraldo (though this episode may demonstrate more an ignorance of American television than fortitude). Mr. Rushton's new book -- a synthesis of a vast body of scientific research on racial differences -- is his most ambitious, and fearless, work. Pat Shipman should be happy. She probably won't be.

Dr. Shipman's book, *The Evolution of Racism*, is beautifully written, and endlessly intriguing, but one is never quite sure what it is supposed to be about. For starters, the title is misleading. The book is only marginally about racism, as the word is commonly understood.

What Dr. Shipman does present is a series of case studies, told largely through biographical accounts, of the politicization of scientific debate over racial differences and genetic explanations of behavior. These are fascinating stories, well told. But the stories have no clear moral.

The book begins with a wonderful portrayal of Darwin's insecurity about his new theory, of Thomas Huxley's unabashed championing of Darwinism, and of Huxley's famous debate with Bishop Wilberforce which put the theory of evolution over the top. Dr. Shipman begins the real discussion of race with the clash between the owlish Rudolf Virchow, perhaps the pre-eminent German scientist of the mid nineteenth century, and the vigorous Aryan Ernst Haeckel. Virchow opposed the theory of evolution because he thought it inconsistent with his own scientific theories and a fundamental challenge to his view of the social order, while Haeckel championed Darwinism and then used it to further his theories of racial superiority and his

political position. Dr. Shipman decries the damage to science in the ensuing struggle.

There follows a discussion of the eugenics movement and of Hitler (who sought justification in Haeckel's writings), and the post-war backlash against the scientific study of race. Dr. Shipman gives us an enlightening account of anthropologist Ashley Montagu [aka Israel Ehrenberg], a vehement anti-racist and author of the 1950 UNESCO Statement on Race. The Ashley Montagu Statement, as it has come to be known, denies the validity of any notion that human groups differ in innate characteristics of intelligence or temperament, and touts scientific support for "the ethic of universal brotherhood."

Montagu subsequently was among those who led the attack on Carleton Coon. According to Dr. Shipman, Coon was "a man betrayed by history." An anthropologist-explorer trained in the early twentieth century, Coon published his life's work, *The Origin of Races*, in 1962. His thesis was that the various races developed long ago--a half million years before we became *Homo sapiens*--and that some races developed into modern humans more slowly than others. Whatever its merits, Dr. Shipman explains, this was a work of science, not of racial politics. Yet it is not difficult to imagine the reaction to such a work in 1962, at the very moment that the civil-rights movement was coming into full swing. What is remarkable is that so much of the criticism from other scientists took the form of personal attack and political diatribe. As the line between concerned scientist and social activist blurred, genetic and evolutionary accounts of racial differences simply would not be tolerated even by those whose job it was to search for the truth: "It was an unresolvable conflict between the fervent social activist and the irascible scientific purist. But the tenor of the times was such that it was the scientific purist, Coon, who was disgraced and, to some extent, driven out of his profession."

Dr. Shipman's final case study is the tale of an attorney and researcher named David Wasserman. Mr. Wasserman had the idea to sponsor a conference on the legal and social implications of behavioral genetic studies of criminality. The story of how his innocent project became entangled in, and eventually destroyed by, the racially charged reaction to a wholly independent Bush Administration program is out of Kafka. Like many interested in biology and behavior, Mr. Wasserman was defeated by those who believe that there are some questions science simply should not ask.

In the end, one wonders where Dr. Shipman stands on this issue. She bemoans the politicization of science and proclaims that we are better off studying racial differences, yet she is afraid of what such research might find. Her fear comes very close to overwhelming her defense of science. Thus, the book ends with the following cryptic summation:

The trajectory begun with Darwin has run its course. No one has sought to provoke a bitter controversy, but the value of differences among humans has reached out its sticky pseudopods and engulfed the unwary over and over again. The monster cannot be outran; it threatens us all. There is a real danger here

To date, we have feared to wrestle with it openly, we have turned our heads and shielded our eyes from the horror of the problem. Rather than face the monster, we have played, instead, at politicizing first evolutionary theory and then genetics, for we are intrinsically political animals and it is a game that comes naturally. We have fought each other--called each other names, accused each other of sinister intent, promulgated bitter insinuations--instead of fighting ignorance. In so doing, we have given the hate-mongers time to feed the monster. It has swelled on a steady diet of racial divisiveness, lies, and half-truths until it is strong enough to destroy us all.

What exactly is this "monster" to which Dr. Shipman refers? It is, apparently, the truth about human differences. How are we to handle the truth, if it "threatens us all"?

Dr. Shipman's unsatisfying answer is to trust in the power of the environment. Should it turn out that there is a significant genetic component to individual and racial differences in behavior, she concludes, "Our only hope lies in the certainty that these attributes are subject to tremendous environmental modification." For her, this is simply an article of faith.

Dr. Shipman's fear of the genetic is evident in her readiness to reject biological explanations. In criticizing early behavioral genetics, for example, she explains that "we have a different perspective on what traits are heritable today." She takes as an example the perceived difference in volubility between Italians and Finns. "Is it because Italians more commonly carry genes for talkativeness than Finns? It is wildly improbable that this is so, for how could such a gene work?" This is a naive response from a physical anthropologist. Of course there is no single gene for talkativeness, yet there plainly is some genetic mechanism that allows humans to talk (unless Dr. Shipman postulates that the lack of speech in other species is entirely due to a difference in environment). Why, then, is it difficult to imagine that this genetic mechanism might differ in degree among individuals or groups?

Dr. Shipman's unease about any genetic explanation is particularly apparent in her treatment of intelligence, which lies at the heart of the controversy about racial differences. She follows unthinkingly the argument set forth by Stephen Jay Gould in his 1981 book *The Mismeasure of Man*. The argument is that the development of intelligence tests in the early part of this century was driven largely by the eugenics movement and belief in the inferiority of certain groups. The upshot of this argument is a form of guilt by association: intelligence tests were born of racism; thus they must retain their racist tint. Mr. Gould's conclusion, which Dr. Shipman parrots, is that intelligence tests at best are extremely sensitive to environmental variation, and therefore are of limited usefulness in measuring intelligence or establishing any genetic component to differences in intellectual functioning.

Mr. Gould is wrong, and so is Dr. Shipman. While it is true that racists found some support in early test results, the historical record reveals that the majority of early mental testers were

engaged in a legitimate scientific enterprise. There were flaws in these tests to be sure, as there are flaws today, but the large-scale problems with test development and administration to which Mr. Gould points have been eliminated. Evidence of the validity of modern intelligence and aptitude tests, and of the significant heritable component to individual differences in intelligence, is beyond rational refutation. (The genetic basis of group differences remains uncertain.) In following Mr. Gould, Dr. Shipman has fallen prey to the same environmentalist bias she condemns in the reaction to Coon and Wasserman.

WHAT IF she is wrong. What if scientific investigation reveals, for example, that there are average differences in intelligence between members of different races that cannot be accounted for by any known sources of environmental variation? Faith in the power of the environment will not shield us from that "monster."

Phillipe Rushton is willing to accept the results of his science. He describes hundreds of studies worldwide that show a consistent pattern of human racial differences. The three primary human racial groups--Mongoloids (Orientals), Negroids (blacks), and Caucasoids (Caucasians)--show significant average differences in such characteristics as intelligence, brain size, genital size, strength of sex drive, reproductive potency, industriousness, sociability, and rule following. On each of these variables, the groups are aligned in the order: Orientals, Caucasians, blacks. On average, according to the data Mr. Rushton reports, Orientals are more intelligent, have larger brains for their body size, have smaller genitalia, have less sex drive, are less fecund, work harder, and are more readily socialized than Caucasians; and Caucasians on average bear the same relationship to blacks. There is, of course, tremendous variation within each group on each of these variables, and a great degree of overlap between groups. The group differences Mr. Rushton reports are not large, but they are demonstrable.

He proposes an evolutionary explanation based on "life history theory." The theory assumes "that each species (or subspecies, such as a race) has evolved a characteristic life history adapted to the particular ecological problems encountered by its ancestors." These strategies are organized along a continuum from "K-strategies" to "r-strategies." K-strategies "emphasize high levels of parental care, resource acquisition, kin provisioning, and social complexity," while r-strategies "emphasize gamete production, mating behavior, and high reproductive rates." Compared to other species, humans are K-strategists. Based on the data he reports, Mr. Rushton observes that Orientals are the most K-strategizing of the human races, and blacks are the most r-strategizing.

According to Mr. Rushton, r-strategies evolve in environments in which the population is kept below the carrying capacity of the environment (that is, where there are more resources for survival than there are members of the population to use them) because of unpredictable factors such as weather or predators. K-strategies are more adaptive in environments in which the population is close to carrying capacity and competitive interactions among individuals are important. Put simply, when there are abundant resources, organisms are better off producing

many offspring and letting them fend for themselves; when the environment is difficult, organisms are better off putting their resources into equipping each offspring to survive.

Mr. Rushton's thesis now falls into place. Blacks evolved in Africa in an abundant but unpredictable environment that favored reproduction over nurturance, relative to other human populations. The harsh environment of northeast Asia in which Orientals evolved favored more nurturing, socialization, and greater intellectual capacity. Caucasian evolution in Eurasia imposed intermediate pressures.

Underlying Mr. Rushton's thesis is the contention that there is a genetic basis for much of the observed between-race variation he reports. Here is where he will meet the most resistance. Behavioral genetic studies of between-race differences are notoriously difficult, as Mr. Rushton admits. Nonetheless he strongly argues for a genetic component to average between-race differences. He presents much behavioral genetic evidence on the question, but his most compelling argument is intuitive. What possible environmental variables could account for the systematic alignment of the races on such a wide variety of characteristics, including behavioral traits evident soon after birth, "the speed of dental and other maturational variables, the size of the brain, the number of gametes produced, [and] the physiological differences in testosterone?" The strictly environmental hypothesis also is undermined by the various studies that demonstrate a significant genetic component to within-race individual differences on each of the behavioral and physical characteristics and the fact that these racial differences are consistent across cultures. Mr. Rushton contends that only an evolutionary/genetic explanation makes sense of these disparate data.

This is dynamite he fails to handle with sufficient care. Mr. Rushton tries in the preface of his book to temper the impact of what follows. He notes that he is dealing for the most part with relatively small group differences, and that these differences are likely the result of environmental determination as much as genetic. He explains also that the mechanisms that mediate genetic effects offer "numerous ways for intervention and the alleviation of suffering." His three-paragraph caveat is a tame cousin to the paean to the environment with which Pat Shipman ends her book. As such, it is woefully inadequate to head off any of the attack that is to come. Mr. Rushton must be aware of this; he seems not to care. "There are no necessary policies that flow from race research," he declares. His reliance on this single idea indicates either a naivete about political reality or an unshakable faith in science.

Mr. Rushton is not naive. He begins his book with a discussion of the difficulties of the scientific study of race:

The propensity to defend one's own group, to see it as special, and not to be susceptible to the laws of evolutionary biology makes the scientific study of ethnicity and race differences problematic. Theories and facts generated in race research may be used by ethnic nationalists to propagate political positions.

Antiracists may also engage in rhetoric to deny differences and suppress discoveries. Findings based on the study of race can be threatening. Ideological mine fields abound in ways that do not pertain in other areas of inquiry.

This passage could serve as a summary of Pat Shipman's treatise. Mr. Rushton adds a twist. He posits that the politicization of the scientific study of race may itself have evolutionary origins. He devotes a chapter to genetic similarity theory, the hypothesis that genetically similar people tend to seek one another out and to provide mutually supportive environments." This phenomenon, according to Mr. Rushton, "may represent a biological factor underlying ethnocentrism." Thus, the reaction to work like Mr. Rushton's may have deeper roots than in our present environment.

Phillipe Rushton has written his own epitaph. Any genetic predisposition toward the defense of one's race only adds to the near impossibility of rational response to the scientific study of race in a world that has seen the Holocaust and racial subjugation. As he explains, "The evolutionary psychology of race differences has become the most politically incorrect topic in the world today." Mr. Rushton's work may be ignored by the fearful, damned by the liberals, and misused by the racists. It is unlikely to be truly understood by anyone.

How Relevant is the Nature/Nurture Controversy to the Need for Eugenics ?

By William J. Andrews, Silver Spring, Maryland Vol. 32, Mankind Quarterly, 04-01-1992, pp 311.

While there are other significant problems related to the future of this country that need serious attention, all of which must be resolved if our civilization is to survive, this paper discusses the need to react to the possibility of a dysgenic threat due to an intergenerational decline in human intelligence. This is a problem that is seldom publicly discussed or debated, and therefore most people do not have an adequate background upon which to base intelligent conclusions. It has been especially clouded by the hairsplitting academic debate concerning the exact degree to which intelligence is dependent on heredity.

The subject of this paper was suggested by a reading of a debate between Eysenck and Kamin[1] relating to the nature/nurture controversy. In this controversy, Kamin holds that environmental factors are dominant in determining a person's IQ, and that any hereditary contribution to IQ is negligible and that genetics therefore is irrelevant to any explanation of acknowledged group disparities in academic or professional success. Eysenck, speaking for the hereditarians, by contrast, argues that although environment plays a role in determining IQ, genetic factors are also important. Hereditarians believe that the threat to the level of IQ in the West is sufficiently real that solutions should be sought in both areas, at least until it has been conclusively determined that remedial intervention is not required.

In reading the referenced work it became apparent that a lay reader could make no serious assessment of the subject without studying the original references cited in that work as well as the many studies which have been carried out since then - a task of several months. Even then a lay reader might conclude that the task was beyond his capabilities as the level of statistical competence required is challenging. The debate focuses on the relative apportionment of IQ to heredity and environment. In what follows, an argument will be made that the need to adopt anti-dysgenic measures is not directly related to the outcome of that debate, but that pragmatically and ethically it depends on the extent to which we are prepared to ignore the threat and simply pass the problem on to our progeny, instead of accepting responsibility for our share of the required effort.

For a lay person interested in this subject, two sources of information are recommended. One is Arthur Jensen's *Bias in Mental Testing*[2] and the other is a review of that book published in

Behavior and Brain Sciences.[3] Jensen's work is complete and thorough. For those seeking less challenging reading, however, the review article cited above will be appreciated. It includes not only a precis of Jensen's book, but also eight pages of peer review and commentary, followed by the author's response. This review thus presents a balanced overview of the entire issue.

As previously mentioned, the core of the Eysenck-Kamin debate is the extent to which a person's IQ depends on heredity and how much upon environment. There are two basic problems posed by the distribution of IQ. One of these is a drift in the average IQ in the downward direction, which makes a nation less competitive in world markets, lowers the standard of living, exposes more workers to obsolescence (due in part to increasing intellectual requirements caused by advances in technology), and makes a democratic government less viable. A second and equally obdurate problem is that significant differences in intellectual competence have been found to exist between groups, and this causes inevitable friction and hard feelings. The crucial parameter about which the debate rages is the degree to which intelligence is genetically determined.

It is the purpose of this article to demonstrate that, from the point of view of dysgenics, the importance of the debate as to the exact heritability of IQ is overblown and concerns largely technical issues, and that the ethical side of the question issue is not dependent upon the outcome of the environment-heredity debate - even though this is now widely accepted as being in the ratio of 30 to 70 (i.e. the heritability of IQ is believed to be in the region of 70%). The issue is an ethical one, and if people in general had a better understanding of the underlying ethical issues, it might be easier for us to develop the consensus badly needed for finding and implementing solutions.

Figure 1 illustrates in simplified format how both evolution and eugenics operate to make changes in our genetic heritage. This figure shows two curves, one labeled "original," the other "derived." The curve marked "original" illustrates the distribution of a parent population, assuming no crossbreeding, as a function of IQ or intelligence quotient. The number of persons with IQs falling between any two adjacent IQ points along the horizontal scale would be represented by the height of the curve at the center of that interval. The total number of persons in the population is proportional to the area under the curve, and can be found given the scale factors for the horizontal and vertical axes. For convenience of discussion this is centered about an assumed mean IQ of 100, and has a distribution characterized by a typical breadth as defined by a standard deviation of 15 IQ points, or more universally understandable, by half of the distance between the half-amplitude points of plus/minus 17.66 IQ points as shown. For the purpose at hand, the vertical scale is normalized to one for the peak of the distribution as a matter of convenience, as the amplitude is not significant in the development.

Drawn through the peak of this distribution is a sloping (dashed) straight line, which represents the number of children the parents have, on an average, with respect to the replacement birth rate. For instance, from Figure 1 at an IQ of 85, one standard deviation from the average of 100, the number of children exceeds the replacement rate by a factor of 30%, and at an IQ of 115 the

number falls short by 30%. These values are illustrative only, and the value of the slope, 0.03, is chosen to make the figure less cluttered. As implied above, the slope is expressed as a fractional value per standard deviation in IQ.

In our society, conditions are such that almost all will survive to maturity. Assuming for the moment that the children of the parents will have the same average IQ as the average of their parents, a curve similar to the "original" can be derived by the multiplication of the "original" distribution by the birth-rate slope, and the resulting distribution is labeled "derived." One can see that the peak and average of the "derived" curve has been shifted in the left direction to a new average value as shown. One effect not accounted for, which in a quantitative analysis would need to be included, is the effect of assortive mating. There is a relatively high level of correlation between parent's IQs, often estimated at 45%. This effect, as well as environment would need to be included explicitly before one could give quantitative significance to the figures.

Clearly this is a very simplified presentation, as in general the curve giving the ratio of the actual number of children to the replacement rate will not be a straight line function of IQ, and the equivalent slope for a real relationship may be steeper, shallower, or of the opposite sign. None of these considerations, however, are significant for the purposes at hand. It is not intended here to assume that this new average so found represents a new value for the average population IQ. In fact, it is almost certainly not that large. Most children's IQs are located between the parent's IQs and the mean of the population. Taking this fact into consideration, the actual new "derived" average change will be some multiple (less than one) times that shown in our example. For the simplified model used here, the fraction that determines how much of the child average IQ change shown one actually gets is the same number which, when multiplied by the parent's IQ referenced to the group mean, gives the average of the children's IQs. This parameter is the "heritability" as defined for purposes of exposition in this very simple model. A more complete analysis would give a more complex but similar result.

Very crudely, this is the process by which evolution made changes to adapt man in his struggle for existence. Those unable to feed and care for their children, either collectively or individually, would have fewer surviving children. Those more capable of producing and raising children until they in turn can reproduce would have more descendants, tilting the curve to the right, indicating an increase in the successful traits. Intelligence is only one of the almost innumerable survival-oriented traits that have been similarly reinforced. In a Malthusian world, where the population is controlled by available resources and birth control measures are not available, life is competitive. In modern societies in which standards of living and social support are such that effectively all individuals survive to maturity, nature's adaption mechanism now uses a new criterion - simply the number of births per mother irrespective of other parental characteristics. If there is a negative slope due the correlation of IQ with birth rate, the average IQ of a population will decline. The significant criteria here are two things, the equivalent slope of the birth-rate/IQ curve and the heritability. At least superficially, it would appear that the heritability is a very

significant parameter.

Figure 2 shows the average IQ drop decline due to the above mechanism, as illustrated in Figure 1, for six values of heritability. Figure 2 uses a raw drift rate, before allowance for heritability, of 1.5 IQ points per generation. There is very little data on this subject, but the value of 1.5 is consistent with a value from Vining[4] of approximately 1 IQ point per generation, which is equivalent to the assumed 1.5 above with a heritability of 0.667. A generation is taken as 28 years, although this is different for different societies and is not constant in time in any case. The heritability assumed for the plot falls comfortably in the range of 0.4 to 0.8 which bounds most estimates. Once again, the exact value selected here is not crucial to the argument. The downward drift is proportional to the product of the amount of crude unbalance before taking into account heritability, the heritability, and time. If one assumes constancy of the values, the average IQ curves drop a constant amount each generation.

It is clear from the curves shown in Figure 2 that the serious problem is not so much in the near term as in the future, and for some assumptions, in the distant future. For one who has no concern for the future the question is moot. Current dysgenic affects are not important to those who are only concerned with the present. On the other hand, for someone who feels concern for those yet to be born, the question is clearly not moot. At almost any value of heritability, the problem is serious.

Most of us will accept that we have a minimum obligation to leave the world in no worse condition than we found it. Given that assumption, one might ask what the genetic burden will be, remembering that the degree of heritability is the multiplier for any eugenic program, just as it is for the dysgenic effects of the adverse birth-rate imbalance. In order to have no degradation in population average IQ, the curve corresponding to the "derived" curve of Figure 2 must average 100 or greater. The short-term seriousness of the slippage, if any, of course, would be ameliorated by low values of heritability. However, under those circumstances, even though the IQ drop is not large, the amount of eugenic effort to bring it back will correspond to the raw dysgenic trend rather than to the drop in IQ. If a dysgenic trend is allowed to proceed unchecked, it accumulates in time. Any postponement of necessary eugenic activities means that posterity will have the onerous chore of remedying our neglect- something it will by definition be less well-equipped to do.

Figure 3 has been prepared to illustrate this issue. For illustrative purposes the value of the downward drift rate is taken to be 1 IQ point per generation of an assumed 28 years. Starting at the left at a presumed average IQ of 100, three options are illustrated. The lowest path illustrates the "do nothing" option. The shadings below the solid lines indicate the presence of dysgenic pressures that cause a constant drop in average IQ. The shadings above, not present in this instance, indicate eugenic efforts. Sometimes the effort above the line is shown with twice the amplitude of the dysgenic pressures. This indicates that adequate eugenic effort must be expended to overcome the existing dysgenic trend before one can effect any positive

compensatory changes. This lower curve, followed to its logical conclusion, results in social chaos.

The response of a group or society to such a drift depends upon the population for which that society has (not claims) ethical concern. If the reference population consists of adults over seventy who happen to have no ethical concern for their children or progeny, certainly the subject is moot. With an expected life of a fraction of a generation and no concern for others, even under the worse circumstances they would have no reason to act. Suppose, however, that the population of ethical concern included all those now living and to be born before 3000 AD. Now one has a vastly different situation and projected consequences for a thousand years into the future are significant.

To take a pragmatic case, predictions from known imbalances in the birth rate of different social classes suggest that the imbalance is now on the order of 1 to 2 IQ points per generation, before allowing for the heritability rh . Taking a generation at about 25 years or four generations in a century, this would give an approximate six IQ point decline in 100 years for an rh of one, which value is almost certain to be incorrect. If it were 0.5 then the six-IQ point would be reached in 200 years. In 1000 years, it would be five times that or 30 points. With today's requirements on intellectual tasks due to our complex technological society, and not the slightest hint that things will get simpler in the future, that should count as a disaster within the context of that person's value judgement.

The value of heritability, therefore, is important because it defines the level of short-sighted selfishness at which the problem of declining intelligence can be ignored. Anyone who has no concern for the future, then, can even ignore the postulated problem if the heritability were one (100%). On the other hand, one might make a basic assumption, not unreasonable, that at a minimum we should not bring children into the world and pass to them an inheritance inferior to that which our generation received - notably, one with an inferior gene pool. That is, we are in no mood to participate in eugenic or other highly "dubious" endeavors unless it is forced upon us by logic. Not letting things get worse we will accept, but progress we will leave to the future. Making such an assumption completely bypasses the question of the value of rh . If rh is high, then a eugenics program is very efficient, but on the other hand the dysgenic stress is also powerful due to the high heritability. Thus the appearance of the heritability in both the requirement side and the eugenics side means that it is irrelevant under the "hold our own" assumption.

If rh is very low, then society's average IQ is a valuable resource, valuable because it is durable, and also because the cost in obtrusive eugenics programs is very high if one wishes to raise the level of IQ for future generations. While a policy of maintaining the status quo sounds like an acceptable objective, there is another objective which couples into the problem in a very significant way. That is the case where one wishes to remove significant differences in intellectual competence between groups as a matter of equity and compassion. Graceful

acceptance of such differences is scarcely possible. Even for a very obtrusive program, the period of time is long under almost any assumption, and is on the order of 100 to 150 years, depending upon what one means by "getting there." If the value of r_h were very low, it might be very difficult to get anything started, given that the short-term payoff would pragmatically be small. On the other hand, any such a gain made would last for quite a while, even if the country allowed itself to slip into a situation where some dysgenic trends were tolerated. And one should be careful not to overlook intangible gains due to the self-respect one generates when one tackles a tough and difficult problem and passes a very significant benefit to one's children.

Therefore, for the midrange of values of r_h , the only rationale for the failure to respond to a downward drift in IQ applies if we wish to, as it were, sponge on future generations. While extremely low values of heritability provide an attractive rationalization for doing nothing and passing the problem on to our children, such rationalizations are scarcely consistent with an ethical system.

Which is to say that the degree of heritability of intelligence, as debated in the nature/nurture controversy - while significant from the standpoint that the more we know and understand, the more effective we can be - does not affect the ethical obligation to recognize the need for some kind of eugenic policy. The threat of dysgenic trends surely exists in our modern world, but what the debate about the precise degree of heritability is about is whether the impact is fast or slow, that is, whether we can excuse ourselves from action and pass the problem to our children by rationalizing excuses for inaction. Viewed in that context, there is no reason why we should delay consideration of eugenic measures just because some scientists still question the exact degree of heritability, or argue that it might vary slightly from race to race. Those who argue for a low value of r_h are opting to pass the problem to our children. Those who perceive a high value of r_h are trying to point out that dysgenic trends may not only be real but that the issue is an urgent one. To do our moral duty we should investigate the threat of dysgenic trends and attempt to take some kind of action -- if nothing more than alerting the public to the situation.

As long as r_h falls within a reasonable range, and is not zero, he who claims the high moral ground should at the very least argue for a very significant effort to clear the air with a "we did this, and this is what happened" type of research program[5-6] the results of which the electorate can understand and accept, in contrast to arcane arguments which only specialists can follow.

In sum, the academic battles that rage over the selection or prediction of heritability are much overblown and of less significance than they are made out to be. Many are arguing without any real understanding of the implications of the debate, which essentially revolve around practical issues concerning the need (or otherwise) to implement some form of eugenic policy. If this generation is ethically concerned about its responsibility to future generations, it should perhaps design a pragmatic test to determine the efficacy of a voluntary eugenics program - one that would be acceptable to both sides, the results of which could be clearly demonstrated to the public at large. As I hope to have shown above, the exact extent to which genetic factors

determine intelligence is not a criterion for the acceptance or denial of the need for a eugenic program. Since none today deny that genetics plays some role in determining intelligence, the need to consider the evidence for dysgenic trends cannot ethically be avoided. A close relationship between heredity and intelligence makes eugenic considerations all the more pressing, but dysgenic trends are quite as fatal whether they take place slowly over a long period of time or rapidly. If we are concerned for the future of the (hopefully) millions of generations still to be born, we must realize that their fate lies to a considerable extent in the breeding practices of those who are currently alive.

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GRAPH: Figure 1. Figure illustrating dysgenics and eugenics mechanism.

GRAPH: Figure 2. Time Impact of value of heritability, (Heritability shown in tenths.)

GRAPH: Figure 3. Schematic illustration of several scenarios,

Race and Crime: A Reply to Cernovsky and Litman

(response to Z.Z. Cernovsky and L.C. Litman, Canadian Journal of Criminology, vol. 35, p. 31, 1993) (Canada)

Summary: The extension of statistical analysis by Cernovsky and Litman was based on erroneous assumptions about the interpretation of variance and correlation statistics, and, therefore, their criticism of the results of the research was unwarranted. There is statistical justification for risk avoidance behavior that is based on the identification of certain individual characteristics such as age, sex and other variables.

J. Phillippe Rushton

Canadian Journal of Criminology, Jan 1994 36 n1 p79-82

In a critique of my work, Cernovsky and Litman (1993) reproduced a table that I constructed from INTERPOL data showing that African and Caribbean countries reported twice the amount of violent crime (murder, rape, and serious assault) as European countries and three times that of countries from the Pacific Rim (Rushton 1990). Summing the crimes and averaging the years gives figures per 100,000 population, respectively, of 143, 74, and 44. These proportionate racial differences are similar to those found using official statistics from within the United States (Wilson and Hernstein 1985).

I used a standard 1-way ANOVA design to test whether these huge proportionate differences in mean levels of crime were statistically significant given the variance involved and found that they were. Cernovsky and Litman (1993) deconstructed these aggregates, first into pair-wise per crime t-tests, then into point biserial correlations, then into a metric of variance accounted for, and finally into the non sequitur that the prediction of crime in individual cases would result in 99.9% false positives!

Cernovsky and Litman's conclusions do not follow from their analyses. The "percent variance accounted for" argument is statistically correct but substantively erroneous, as discussed at length by Rosenthal (1984) and Hunter and Schmidt (1990). The $[r.^2]$ (and other indices of percent variance accounted for) are related in only a very nonlinear way to the magnitude of effect sizes that determine impact in the real world. Small correlations can have large impacts.

Rosenthal (1984) and Hunter and Schmidt (1990) provide numerous examples of how a "small"

effect can have major practical consequences. I have transformed some of their examples from medical procedures and personnel selection into those concerned with criminal justice. Thus, in selection for parole, a validity coefficient of 0.40 should not be squared to mean that only 16 percent of the variance of recidivism is accounted for. Instead, using regression predictions, it means that for every 1 standard deviation increase in mean score on the selection procedure, a gain of the magnitude of a 0.40 standard deviation will result in outcome success -- a substantial increase with considerable practical value. An effect size of even 0.10 for a parole procedure, for example, would increase the chance of success from 50:50 to 55:45.

A relatively small difference at the mean can generate rather large differences at the tails of the distributions (where most repeat offenders are to be found). A correlation of .16 for a greater black than white likelihood to break the law would mean that, at the 95th percentile of the distribution, about 7 percent of the perpetrators would be black and 4 percent would be white, a ratio of nearly 2:1. The Asian versus African correlations reported by Cernovsky and Litman (1993) based on INTERPOL data were double this ($r = .32$).

A correlation of 0.32 between a treatment and an effect means that an effect that accounts for only 10 percent of the variance could reduce the crime rate by almost 50 percent (Rosenthal 1984: 130). It is, therefore, quite rational for the public to attempt to reduce their chance of being victimized by avoiding individuals with perpetrator characteristics (age, sex, socioeconomic and other variables such as race; Rushton 1990). Thus Cernovsky and Litman's (1993: 34) chastising me for commenting in the media is inappropriate.

Levin (1992) has examined some of the resulting philosophical issues about probable risk assessment and the rights to risk avoidance raised by the disproportionate differences. Levin holds that the taking of differential precautions is both logically and morally justified. He cites a parallel with rational choice theory in economics and rejects the arguments that differential perceptions of dangerousness are the result of "illusory stereotypes".

Cernovsky and Litman (1993: 35) cite a number of published critiques for a "plethora" of technical errors that I am supposed to have made. For example, they claim that I "erroneously" listed as supportive the large-scale study of cranial capacity by Beals, Smith, and Dodd (1984). It is Cernovsky and Litman's interpretation of this study that is in error and I refer the reader to tables 2 and 5 in Beals et al. (1984) so that they can see for themselves the hard data and statistically significant population differences in [cm.sup.3]. Irrespective of interpretation, the rank ordering in this world review is in accord with my prediction. Cernovsky and Litman also fail to mention more recent empirical support for my hypotheses (Ellis and Nyborg 1992; Rushton 1992).

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A Review of "A New Morality from Science: Beyondism"

Richard Lynn,

"Review: A New Morality from Science: Beyondism." by R.B. Cattell. Pergamon Press, New York, 1972. Pages xvii and 482. Irish Journal of Psychology 2 #3 (Winter 1974).

A new book by Professor Cattell is always an exciting occasion, for his is certainly one of the most brilliant of contemporary psychologists. Before he was thirty he had devised the culture-free intelligence test and worked out a statistical technique for measuring the decline of the British national intelligence. Later he formulated the double g theory of fluid and crystallised intelligence and designed the world famous 16PF. And now we have his latest work: Beyondism.

Beyondism! Whatever is it? It is a new system of ethics designed to bring about the improvement of the human species. We need a new system of ethics, Cattell begins by telling us, because the old ethics based on religion is so clearly breaking down throughout the world. The new ethics of Beyondism is based not on religion but on science. Its objective is the improvement of the human beings and society: a better world. The means of bringing about this lie in the application of Darwin's law of evolution.

People who considered the problem of how the world can be improved fall into one or other of two camps. On the one hand, there are those who believe it is possible to draw up a blueprint of the ideal society. Everything is to be planned. This is the vision of socialism. The alternative approach is that of conservatism. To the conservative, we are not able to tell what an improved society of the future would be like, any more than our primate ancestors could imagine human society, or mediaeval man the advances societies of today. In the fact of our limited powers of foresight and understanding, and the unknown discoveries which will be made in the fullness of time, the best course is to let a better society evolve gradually of its own accord.

Of these two approaches, Cattell places himself squarely in the conservative camp. The problem, posed from the viewpoint of the conservation tradition, is not to sit down and plan a specification for Utopia, but to set up the conditions under which further evolutionary progress will occur. For this we need to go back to Darwin, for he gave us the master theory of the principles of evolution, applicable not only to the development of different species in the past but also to the future progress of mankind.

Now evolution takes place where there is a variety of different types who compete against one another, and in this competition the fittest survive and the unfit become extinct. This, therefore, should be the first principle in the design of human society. The requirement of diverse competing types applies both to societies and to individuals. Among societies the unit should be

the nation and there should be the widest variety of different cultures. Some will be capitalist, some socialist, and some mixed economies. Some will be democracies, others oligarchies, and yet other dictatorships. They will have different religions, or none; and they will have different kinds and distributions of intelligence and personality qualities. The nations will compete, and in the competitive struggle the fittest will survive.

If the evolutionary process is to bring its benefits, it has to be allowed to operate effectively. This means that incompetent societies have to be allowed to go to the wall. This is something we in advanced societies do not at present face up to and the reason for this, according to Cattell, is that we have become too soft-hearted. For instance, the foreign aid which we give to the under-developed world is a mistake, akin to keeping going incompetent species like the dinosaurs which are not fit for the competitive struggle for existence. What is called for here is not genocide, the killing off of the populations of incompetent cultures. But we do need to think realistically in terms of "phasing out" of such peoples. If the world is to evolve more better humans, then obviously someone has to make way for them otherwise we shall all be overcrowded. After all, ninety-eight per cent of the of the species known to zoologists are extinct. Evolutionary progress means the extinction of the less competent. To think otherwise is mere sentimentality.

As a general rule it would be best for national cultures to keep themselves to themselves and not to admit immigrants. There are several reasons for this. Isolation would give rise to societies with greater diversity and individuality, both culturally and genetically. Indeed, it would be desirable if the human race could evolve several different non-interbreeding species, since this would increase the options for evolution to work on. Another reason for discouraging migration is that migrants are often people of low genetic quality who reduce the efficiency of the population they join.

The first principle for evolutionary progress is therefore competition between diverse cultures, but we have to think also of the principles conducive to the efficiency of individual nations especially that of our own if we wish to be among the survivors.

It is of course necessary to improve the society by better education, health and so forth. Everyone agrees with that. But it is equally important to improve the genetic quality of society. Cattell maintains that in order to do this we need to encourage the intelligent people to have more children and the unintelligent to have fewer. And here, as in international relationships, the altruistic impulses have become unhealthily strong in advanced western societies. For just as in certain people the aggressive impulses, or the sexual impulses, can get out of hand, the same thing can occur with the altruistic impulses and has in fact occurred in advanced western societies. For example, we are too altruistic towards the poor. People are poor largely because they are incompetent and unintelligent. Such people should not be encouraged to breed. Conversely, we are too harsh to the rich. Progressive taxation, for example, is hard to justify. Why should the rich have to contribute more than anyone else through taxation to the

maintenance of state services, since they do not benefit more from them? Morally, this cannot be justified. Eugenically, it is equally undesirable. For the rich are rich, broadly speaking, because they are intelligent and competent and we should encourage them to have more children. Let them keep their money and they may be persuaded to do so. We should allow the effects of competition full reign within societies as well as between societies. For it is through competition that evolutionary progress will take place.

Tough speaking, you may say. No doubt, but then Cattell is saying that this is a tough world. It is the law of evolution which is tough, and you cannot fight against the laws of nature. You have instead to work with them, working with the grain and not against it. Ignoring the laws of nature brings its own nemesis. Thus a society which has grown too soft towards its incompetents, encouraging them to multiply unduly, and places too great handicaps on its more efficient and enterprising, will itself become an incompetent society and will in time fall victim to a more vigorous nation. Moral defects within societies are thereby corrected in the competitive struggle between societies. The law of evolution cannot be fought or circumvented. We can ignore it, at our peril, or we can recognize it and work with it. But if all this -- nature red in tooth and claw -- seems harsh, we have to remember that this is the mechanism through which evolutionary progress takes place, through which man himself has evolved from more primitive forms of life, and through which future progress will occur.

And so for Cattell the basic principles for a scientific ethics are these: diverse societies and types; competition between societies and between individuals; survival of the fittest, extinction of the unfit. This is the way to a better world. How different from most prescriptions for Utopia, with their socialistic world states in which competition is extinguished and all men work together in a spirit of co-operation, brotherly love and, no doubt, boredom. And how different is Raymond Cattell today from the young Raymond Cattell who in the nineteen thirties, in his *Fight for the National Intelligence*, described himself as a Socialist. Over the last forty years Cattell has evidently travelled (sic!) the long road from radical Socialist to high Tory. He is not the first to have done so. Those who share this latter viewpoint will welcome a recruit of such undoubted brilliance as Raymond Cattell.

Professor Shockley's Experiment

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One of the experiments that Professor Shockley suggested to the National Academy of Sciences at its Spring Meeting of 1968 ("Proposed research to reduce racial aspects of the environment-heredity uncertainty") has been conducted; the results are in, but you won't hear about it in the mainstream media. If recent history is a guide we will first wish the results the death of silence. Pretend they do not exist. If that fails, then yell and scream and call names. Outrage at insensitivity; heap acrimony upon ad hominem (see Pearson, 1991). The unfortunate truth that no one was particularly hoping for is completely at odds with the revealed wisdom of the egalitarian left: when black babies are adopted into middle class bright white families they grow up to function intellectually and emotionally like blacks.

Professor William Bradford Shockley (1910-1989), you will recall, was awarded the Nobel Prize for Physics in 1956. That was for research conducted at Bell Telephone Laboratories where he was director of solid- state physics research. It was in 1948 that his three-man research team created the point contact transistor; Shockley personally invented the junction transistor, the analog and the junction field-effect transistor, thus ushering in the age of solid state electronics. He and his co-workers shared the Nobel Prize. Shockley left the Bell Laboratories in 1958 and in 1963 was appointed to a named chair at Stanford University. From the mid-'60s until his death in 1989 he devoted much of his scientific efforts to questions of heredity, intelligence, and the welfare of western civilization. He spoke out repeatedly against the "entrenched dogmatism" which prevented open discussion and unbiased research concerning some of the most important issues facing our civilization. For his humanitarian efforts he was excoriated by the left-leaning press and "politically correct" academic scientists alike (Pearson, 1992). While it has become de rigeur to complain about an uninformed and biased media, they merely reflect a deeper problem. The power to destroy civilization lies with the scientists and intellectuals, our modern secular priesthood, who have given up the canons of science - objective observation of the real world combined with honest reporting - in order to accomodate the dogmas of a secular religion. An irrational ideological zealotry that emphasizes the dogmas of socialism at the expense of scientific knowledge has already brought about the downfall of one of the two great superpowers. Can we be far behind if we pervert truth to follow the precepts of the same secular religion?

Roger Pearson has well summarized Shockley's thesis, which scared the political Left. It was simple: intelligence is a quality which is of prime importance to humankind in the struggle to survive - but it is not evenly distributed between individuals and races. The available scientific evidence indicated that the level of an individual's intelligence is predominantly determined by heredity, and also that the less intelligent members of the American population are reproducing

more quickly than those genetically better endowed in this vital area of human competency:

Shockley's attempts to bring these facts to the attention of the public, and his campaign for a top-level, government-funded scientific enquiry into the question of human quality, was anathema to liberals and to those on the political Left. The liberals felt that his ideas challenged the doctrine of equality to which they were wedded, and the political Left quickly recognized that they challenged their traditional argument that poverty was due solely to class (and race) exploitation rather than, as Shockley implied, the low intelligence of the inhabitants of the inner city slums who were unable to find employment they could handle in the increasingly technical world of modern America. (Pearson, 1992, p. 18).

It was in the 1960s that the Great Society's War on Poverty got going, in the 1960s that Arthur Jensen first got into trouble for pointing out that Head Start programs had not been successful in raising the intelligence of black youth, and in 1968 that Shockley suggested a "research proposal that might reduce the environment-heredity uncertainty regarding racial differences".

Shockley's Proposal

Shockley told the Academy "I have heard that the drastic environmental change of adoption from a Negro slum into a middle-class New York Jewish family has actually occurred for some 70 orphans." (Shockley, 1968, p. 102). Of Course. The adoption design is the closest that you can come with humans (for ethical reasons) to conventional scientific procedures for separating genetic from environmental causes of the traits of individuals. It's the human analog of the cross-fostering experiment: Take a Pit Bull puppy and have it be raised by a Cocker Spaniel mom (and dad) in a Cocker Spaniel-provided home and social milieu. If the Pit Bull grows up to think like a Cocker Spaniel, or to act like a Cocker Spaniel, then you know that the environment of rearing influenced the traits in question. Now, if the radical environmental change of cross-fostering does not change the Pit Bull into a Cocker Spaniel, then what hope is there for the less drastic and less complete interventions of Head Start and other "enrichment" type programs?

Since 1965 over \$5.4 Trillion dollars have been spent in the Great Society War on Poverty (Rector & Lauber, 1995), and we find ourselves bracing for the arrival of the Super Predators (Dilulio, 1995). In the meantime, Shockley's experiment has been conducted, more or less, and the results are in.

Adoption Study

For the experiment we are indebted to the eminent child psychologist Dr. Sandra Scarr (recent President of the American Psychological Society and a Past President of the Behavior Genetics Association, among other accolades), and her colleagues (Scarr & Weinberg, 1976). The experiment began in the early '70s when Scarr and her original collaborator Richard Weinberg were faculty at the University of Minnesota. They have pointed out that "The intellectual and

social climate of Minnesota is generally conducive to liberal and humanitarian movements such as interracial adoption" (p.727). In 1966 an influential organization named the Open Door Society of Minnesota was formed by adoptive parents of black children. The founding president of the Open Door Society was a leading columnist for a Minneapolis daily newspaper who frequently wrote about his multiracial family. In this auspicious social climate Scarr recruited 101 families that lived within a 150-mile radius of the Twin Cities (Minneapolis-St.Paul) metro area. Many of the participating families were recruited through the Newsletter of the Open Door Society. The 101 families included 321 children who were 4 years of age or older when originally tested in the 1970s. There were 145 biological offspring and 176 adoptees, of whom 130 were black and 25 white. The remaining 21 consisted of children of Asian, American Indian, and Latino ancestry. Further, many of the "black" adopted children could be grouped as to whether they had 2 black biological parents (black/black kids) or one black and one white biological parent (black/white kids). When originally evaluated the average age of the children was seven, and the results were happily reported in many media outlets and reviewed in many standard psychology and child development or educational psychology textbooks. A follow-up study was conducted 10 years later, at an average children's age 17 (Weinberg, Scarr, & Waldman, 1992). Don't expect to see the results of the follow-up study in the textbooks or the mainline liberal media.

National Dilemma

The national dilemma that provides the backdrop for Professor Shockley's experiment is the large gap between black's and white's average intelligence. It is important to note that among serious scholars the IQ gap has never been an issue: It is the reason for the gap - cultural deprivation, genetic differences, etc.- that has been the issue. The racial gap in average IQ is large and important: About 15 points separate the black average of 85 from a white average of about 100. These 15 points represent about one standard deviation of the bell curve of the intelligence distribution. From this it follows that only about 16% of blacks equal or exceed the average of whites, thus by white standards fully 84% of blacks are of below average intelligence. The racial discrepancy is larger the further one gets from the average - blacks are very much over represented among the intellectually disabled and very much under represented among the exceptionally gifted. These facts are essentially what is behind the perceived need for affirmative action and other black preferential social policies, although it is generally quite incorrect to mention outside the confines of the ivory tower - as Charles Murray discovered in the firestorm of criticism for having written (with the late Richard Herrnstein) *The Bell Curve*. Faced with the racial gap, as well as a wide range of individual differences within each race, the egalitarian priesthood has waged one of the most successful disinformation campaigns in the annals of modern propaganda. IQ went from being one of the brightest stars in the firmament of applied psychology to being deemed useless, misleading, evilly oppressively racist, and even outlawed in many settings. (If the race is important and Cocker Spaniels regularly run substantially faster than do Pit Bulls, then viciously attack the stop watch). Antidotes to the ideological zealotry include *The Bell Curve* (Herrnstein & Murray, 1994), as well as Arthur Jensen's *Bias in Mental Testing* (1980) and Stanley Burnham's *America's Bimodal Crisis* (1993). Of course intelligence

is important and of course IQ well predicts performance in many settings.

Childhood Results: Environments Matter [Blacks will be Whites]

Against this anguishing national (and international) backdrop Scarr and Weinberg (1976) reported that when evaluated at an average age of seven, the 99 black and interracial children adopted in the first year of life had average IQ scores of 110. Wonderful. The egalitarian liberals literally jumped for joy. Quickly into virtually all the introductory textbooks in the relevant fields went the findings and the interpretation: Blacks raised in the favorable home and cultural milieu provided by bright middle class white parents not only did well, they actually did substantially better than the national average for whites. Clearly the interpretation was that the abysmal conditions and performance of blacks in general was correctable by the liberal agenda of environmental treatments. Improve the home environments, schools, and general social milieu of blacks and their intellectual performance will substantially benefit. Scarr and Weinberg (1976) interpreted their results thusly: "One reason for the substantial increase in test performance of the black and interracial adoptees is that their rearing environments are culturally relevant to the tests and to the school ... [the] black children in this study have been fully exposed to the culture of the tests and the school,"(p. 737). "There is no question that adoption constitutes a massive intervention, as noted earlier, and that it has a favorable impact on IQ" (p. 738). "The major findings of the study support the view that the social environment plays a dominant role in determining the average IQ level of black children" (p. 739). Of such findings and interpretations are myths created and liberal heroes made.

Although not emphasized, usually not even mentioned in the secondary reports, there were disquieting patterns in the data of the seven year olds. And in fairness to Sandra Scarr and Richard Weinberg it should be noted that they presented the data in an apparently unbiased manner; they are of course free to emphasize whatever interpretations they find appropriate for whatever reasons. The final words of their 1976 report are "that both social and genetic variables contribute to individual variation among them" (p.739).

Other critics found in the study results which were interpretable from a genetic perspective. For instance, the adoptees with two black biological parents (b/b kids) averaged IQ of 98.6; for b/w adoptees the value was 109.0, while white adoptees (w/w) had average IQs of 111.5 and the biological offspring of these unusual middle class parents averaged 116. Well. Here we have approximately 13 IQ points difference, not so far different from the 15 points that separates blacks from whites in the general population:

$$[w/w 111.5] - [b/b 98.6] = 12.9$$

Give the b/b a dose of white genetic parentage (b/w) and the average IQ goes up about 10 points. Raised in a white family environment so advantageous that the children born to those white families average an IQ of 116, b/b adoptees only manage an average of 98.6. Of such politically

incorrect observations are doubts made. Well, answered the authors, in effect, no single experimental study is perfect in all respects and this one is no exception. There were unfortunate confounding variables in the data that could perhaps have been responsible for the discrepancies. For example, b/b kids tended to have been placed for final adoption somewhat later than others, thus perhaps early perinatal experiences were somehow detrimental to IQ, or, perhaps "expectancy effects" were at play and parents adopting b/b kids didn't expect as much of them as from b/w or w/w kids. The possibilities for equivocation are seemingly endless. But, however, it seemed clear that the b/b value of 98.6 was higher than the black population average of 85, and 98.6, by golly, is awfully close to the general population average value of 100. Bottom line for the interpretations widely accepted from the study conducted at average age seven: Environments matter and "good" environments like those provided by bright white middle class parents increased the IQs of black children. In other words, Pit Bull puppies raised by Cocker Spaniels acted like Cocker Spaniel puppies. But what of their behavior as adults?

Limits of the Family Influence

While questions of racial inequalities and what to do about them, or indeed, what can be done about them, have been festering in the national agenda, quite remarkable progress has been made in the general sciences that deal with human development and behavior genetics. From new data have come new and quite surprising interpretations. The new data are mostly from studies of adoptees evaluated when they are adults, rather than as in most older studies where adopted children were studied in childhood. Also there are many new data concerning adult twins, raised together or raised apart, and other kinds of family arrangements. It now seems that for many physical and psychological traits, including measures of personality, intelligence, and psychopathology, identical twins that have been raised apart in different families resemble one another very closely in adulthood. At the same time, adoptees, although sharing a common family environment across many years, do not resemble each other in adulthood. Quite amazing and quite surprising, even to the scientists who have conducted the studies. Geneticist David Rowe in his recent book *The Limits of Family Influence* (Rowe, 1994) points out that

Most people believe that different rearing experiences have something to do with differences in the way children turn out. A social scientist opposing this cultural belief would be dismissed as uninformed and possibly dangerous. In response, many people would recount stories from their own lives. Social scientists would mention the massive research literature showing influences of rearing on behavioral development. Nonetheless, many societies once accepted a flat earth; both experts and cultural beliefs, on some occasions, may be wrong. (p. 1).

This is pretty heady stuff, and Dr. Sandra Scarr has herself been an influential theorist in these new directions.

The traditional view in the social sciences, with roots in centuries-old philosophical speculations, has been that family environments, the social fabric in which individuals grow up,

have important and lifetime cumulative influences on how the individuals turn out. Different societies or social class experiences caused differences among the individuals that grew up in them. The problem has always been that by-and-large genetically different people raise their children in their own differing ways, so that when the children grow up to resemble their family and to be different from others, it was impossible to separate the genes from the environments as causes of individual differences. To put it somewhat crassly, it has been known for centuries that, in general, poverty and stupidity tend to go together. The liberal catechism has taken it as central that poverty causes stupidity. However, that may be mostly, if not entirely, wrong. To an important extent stupidity causes poverty, and the "root cause" may be largely genetic. Such heretical thoughts are usually branded as evil, even "racist", by the enforcers of liberal ideological orthodoxy. But science accumulates knowledge, sometimes even in hostile intellectual environments. It takes a cross-fostering experiment - an adoption study, to separate genes and family experiences as causes of individuality. Now that a number of such studies have been done, the newly emerging interpretations run something like the following:

In childhood, adopted children tend to correlate somewhat with the parents who are raising them. This is because children are very importantly under the care, guidance, and coercion of their parents. At average age seven or ten, whether a child plays the piano or shoots hoops on a street corner, depends largely on the interests and involvement of the parents. Does the child know and enjoy camping, fishing and the great outdoors, or music, concerts and the symphony, or beer, booze and dope? It depends very much on what the parents are into and to what the parents expose the child. So, in childhood, adopted children tend to somewhat resemble each other and to resemble the people who are raising them. However, around adolescence/puberty some major changes take place. Biologically some genes active in children turn off and other genes active in adults turn on. One of the consequences is physical and mental maturation: Sex organs grow and sex fantasies grow apace. Another consequence is the "dispersal stage" common to most mammals and manifested among humans as adolescent "rebellion", mild or severe. Most young people begin to more- and-more control their own interests and choose their own activities and their own friends. At 10, who you play with is largely determined by what the parents allow; at 16 most youths much more choose and select their own friends from among a wider field of possibilities, often to the consternation of their parents. Play the piano? At 10 it is parent's choice, by 18 you quit if you wish. The upshot of all this becoming-adult is that individually different people seek out their own individually compatible lifespaces. The surprising outcome is that as adults, individuals that were raised together but are not genetically related (adopted siblings) correlate zero on many measures of intellectual and personality functioning. Similarly, the adopted children, when adult, do not resemble (the correlations are zero order) the parents that raised them. There is little or no evidence for cumulative effects of family environment. Rather, family resemblances, and differences, are importantly influenced by genes. Heresy.

Adult Results: Blacks will be Blacks

In this minefield of theoretical readjustments Professor Shockley's experiment sits, waiting to

detonate. A ten-year follow-up was done, the children evaluated at an average age of seventeen (Weinberg, Scarr & Waldman, 1992). The results and their interpretation have created a bit of a tempest, so far largely confined to the academic teapot as reported in the scholarly journal "Intelligence". Initially the authors maintained an interpretation of the evidence as supporting environmental influences on the malleability of black's IQ: "These results (demonstrate) the strong effects of the rearing environment on IQ." (p. 131), "the results of the longitudinal follow-up continue to support the view that the social environment maintains a dominant role in determining the average IQ level of black and interracial children" (p. 133). To some it looked like spinning through Alice's mirror, or theoretically jumping through the Politically Correct environmentalist hoop twice. But, after all, genetic interpretations of human race differences in IQ will not get you elected president of the American Psychological Society; they will get you defamed and shunned, at least. After challenge, especially by Richard Lynn of the University of Ulster and Michael Levin of City College of New York (Levin, 1994; Lynn, 1994), the authors wrote that "it is not possible to reach definitive conclusions Our findings do not speak directly to genetic and environmental etiologies of racial differences in IQ," (Waldman, Weinberg & Scarr, 1994, pp 41, 42). On the contrary, the results not only speak, they literally shout, but very Incorrect Politically.

When retested as young adults (average age 17) the b/b adoptees displayed an average IQ of 89.4 while the w/w adoptees averaged 105.6 and the white biological children of the adopting middle class white parents scored 109.4. Recall that generally the racial IQ gap nationally is about 15 points, whereas here the gap is:

$$[w/w 105.6] - [b/b 89.4] = 16.2$$

This is substantially similar to the previous result when the children were young. What is different in this testing of older adoptees is the b/b average of 89.4. Where is there any evidence for a role of the social environment? Remember the earlier quotation: "There is no question that adoption constitutes a massive intervention the black children in this study have been fully exposed to the culture of the tests and the school," (Scarr & Weinberg, 1976, pp 738,737). A lifetime of immersion in middle class white family life sufficient to produce average IQs of 109.4 (biological offspring) and 105.6 (white adoptees), for an average black outcome of 89.4. This may appear to be above the nominal national average for blacks of 85, yet Levin (1994) points out that Minnesota blacks score somewhat above the national average. Parenthetically, the white biological parent dosage effect was maintained in that b/w adoptees averaged an IQ of 98.5:

$$[b/w 98.5] - [b/b 89.4] = 9.1$$

As noted above, no single experimental study is perfect, and Scarr and colleagues now emphasize that there were some differences across adoptee groups in pre-final placement experiences. Perhaps Professor Shockley's experiment is important enough that an attempt

should be made to replicate it on a large scale and without equivocal confounds. In the meantime, in the main these results are very clear, and very consistent with a wealth of other data and theory. Unfortunately these real data are completely at odds with the revealed wisdom of the egalitarian left. Here in the real world, as a young adult the Pit Bull, after being raised by Cocker Spaniels, acts like a Pit Bull.

An early abstract of the follow-up experiment conducted when the adoptees averaged 17 years of age mentioned social deviance and psychopathology at higher levels than had been found in other adoption studies (Scarr, Weinberg & Gargiulo, 1987). Languishing in two unpublished doctoral dissertations completed by graduate students are some potentially interesting findings. One dissertation, by Kimberly DeBerry (1991), was completed at the University of Virginia where Sandra Scarr is now a Professor. Among other things, the DeBerry dissertation reports the results of the Minnesota Multiphasic Personality Inventory (MMPI) testing at average age 17. Fully 2/3 of the interracial adoptees that took the test are said to display evidence of maladjustment by having at least one clinical scale elevation on the MMPI. Moreover, the white biological offspring of the middle class white adoptive parents fared just as poorly. These data require some speculative interpretation: Do they mean that Pit Bulls raised by Cocker Spaniels grow up to be at increased risk of psychological maladjustment? Could it be that Cocker Spaniel pups are harmed by being raised in mixed litters with Pit Bulls?

To interpret the MMPI results from the adoptees requires a consideration of the characteristics of the test. The Minnesota Multiphasic Personality Inventory was one of the most reliable and most widely used assessment devices for identifying abnormalities of personality. However, like any psychological test it was not perfect and has been revised to become MMPI-2. The first version of the MMPI was used in the DeBerry version of Professor Shockley's experiment. The normative group for the original MMPI was 724 people at the University of Minnesota hospital tested in the late 1930s and early '40s. It was reportedly a good match for the 1940 Minnesota census. Dr. Ned Megargee, a noted MMPI expert, once checked those census data and estimated that there might have been 1.5 black people included in the 724 (Megargee, 1996). It is well established that generally blacks tend to have elevated scores relative to the standardization norms. Also, younger people tend to have elevated scores on some of the scales. Of the 10 basic MMPI scoring scales, the four with the most reported elevations in DeBerry's dissertation were, in order of frequency, 9, 5, 8, and 4. The standard characterizations of high scorers on these scales are:

9 (Ma) Mania - High scorers are called sociable, outgoing, impulsive, overly energetic, optimistic, and in some cases amoral, flighty, confused, disoriented; 5 (MF) Masculinity-Femininity - High-scoring males are described as sensitive, aesthetic, passive, or feminine. High-scoring females are described as aggressive, rebellious, and unrealistic; 8 (Sc) Schizophrenia - High scorers are often withdrawn, shy, unusual, or strange and have peculiar thoughts or ideas. They may have poor reality contact and in severe cases bizarre sensory experiences - delusions and hallucinations; 4 (Pd) Psychopathic Deviate - High scorers often are rebellious, impulsive,

hedonistic, and antisocial. They often have difficulty in marital or family relationships and trouble with the law or authority in general. (adapted from Rosenham & Seligman, 1984, p.163).

Without a matched age and race comparison group it is difficult to know what to make of the finding that 2/3 of the tested transracial adoptees had clinical elevations relative to the norms. It could simply be that these young people, although raised in the home and social milieu provided by middle class white parents, are performing like typical blacks raised under usual conditions. In other words, as was the case with the IQ data, the personality results indicate that Pit Bulls raised by Cocker Spaniels grow up to be Pit Bulls.

Does it Hurt Whites?

The elevated scores of the white biological children of this sampling of middle class white parents are problematic. Of the many possible interpretations, three likely possibilities come to mind. One is that it is hard on the white biological children to be raised alongside black adopted siblings. It would not be the first time that well-intentioned liberal humanitarian endeavors turned out to have unanticipated consequences (a fascinating book-length account of the effects of The Great Society is titled *Paved with Good Intentions* (Taylor, 1992)). We really don't know the consequences for the white siblings. We do know that there are many physical traits and maturational rates that are different between black and white children, beyond the psychological variables that were the chief focus of the study. Would it affect the personality of a bright white child to be raised with a different race sibling that tended to be stronger, had denser bones and better physical coordination, matured sooner and was more boisterous and less intelligent (Rushton, 1995)? A recent report from the U.S. Department of Agriculture (concerned with nutritional needs in childhood) reports that black children experience their growth spurt two to five years earlier than white children. By age 7 for boys and 6 for girls, blacks have accelerated muscle and bone development. They sooner grow taller and heavier and mature sexually about three years earlier than whites (Nando.net, 1996). A very extreme across-species adoption study was conducted back in the 1930s by the animal psychologists Winthrop and Louella Kellogg. They reported their findings in a 1933 book *The Ape and the Child: A Study of Environmental Influence Upon Early Behavior*. When their first child Donald was born they located a baby Chimpanzee named Gua. Donald and Gua were raised together as siblings and treated as alike as possible, until being separated when Gua was 16.5 months of age and Donald was 19 months. We have no way of knowing if there were any long range effects of this experience for Gua or Donald. Anecdotally, a scientist who knew him has reported that Donald had a gait with a definite simian lope. Tragically, Donald committed suicide as a young man.

A second possibility to account for the elevated clinical scales on the MMPIs of the biological children of the middle class white parents that took part in transracial adoptions would be to invoke normal familial relationships. Unfortunately we do not have the data for the biological parents and thus cannot make the necessary comparisons. However, a likely possibility is that these youth are simply displaying the well-known phenomenon of familial correlations. Without

casting any aspersions on the adopting adults, one must ask what kinds of middle class white couples in the social environment of 1960's Minnesota initiated cross-racial adoptions? Undoubtedly caring adults who felt a social commitment and followed through with quite unusual behavior. Such adopting was a very rare event and was "not normal" in just this sense of being rare. People who engage in very unusual behaviors, whether socially desirable or socially undesirable, tend to be unusual in a wide variety of ways, including personality traits. Thus it is entirely reasonable to hypothesize that the MMPI results of their biological children might simply reflect the well known familiarity of personality characteristics. This parental-resemblance hypothesis is less likely to account for the elevated deviancy rates of the black adoptees because in other studies personality characteristics of young adult adoptees have been found to not correlate with those of their adoptive parents or adoptive siblings (Rowe, 1994).

The third possible interpretation of the elevated rates of psychopathology reported for both black adoptees and the white biological children in DeBerry's dissertation is simply that the findings may be spurious. That is, they may not replicate nor generalize. These results could be due to any number of quirky events that might be unique to this particular study. For instance, at the 17-year old follow up, not all of the adoptees or biological offspring from the original study took the MMPI. Was there selective participation that led to the particular pattern of findings reported? Because the results and interpretations are of potentially great importance, Professor Shockley's experiment probably should be replicated.

In a dissertation completed at the University of Minnesota, L. Fischer (1991) related patterns of family functioning to MMPI characteristics of both the transracially adopted and the biological offspring. She noted generally that the white "Biological children showed significantly more psychopathology than transracial adoptees" (p. 73). So again an indication that Cocker Spaniels do not thrive when raised as littermates with Pit Bulls. Two of the dimensions of family environment are labeled "Adaptability" and "Cohesion". Cohesion has to do with the emotional bonding among the family members. The members of high cohesion families are said to be "enmeshed", while low cohesion families are "disengaged". When measured by deviancy of MMPI scores, the white offspring seemed to be better in highly cohesive families and worse with low cohesion. For the transracial adoptees, family cohesion was not as important as was adaptability. The adaptability dimension has to do with the tendency of a family to change its rules and relationships (power structure, roles, etc.) in various situations. Adaptability involves the discipline, roles, rules, and control systems of the family. Very high adaptability is called "chaotic" which grades through "flexible" to "structured" to "rigid" for low adaptability families. The transracially adopted young adults clearly did better, as measured by MMPI deviancy, with low adaptability. With rather rigid, structured roles and rules they appeared better overall and for them cohesion was unimportant. Without getting into the conundrums of directionality of causation (psychologically healthy adoptees create rigid family rules, or families with rigid rules tend to develop psychologically healthy adoptees, or both are parallel manifestations of genetic predisposition), it is potentially important to note that the relationship between kind of family structure and the apparent well-being of the children was different for the white biological offspring and the transracial adoptees. Consistent with the historical observations of such

disparate commentators as Albert Schweitzer and traditional Southern County Sheriffs, one interpretation is that Pit Bulls do best with rather strict and inflexible rules. On the other hand Cocker Spaniels respond favorably to emotional bonding.

What is to be Done?

One of the experiments that Professor Shockley suggested to the National Academy of Sciences at its Spring Meeting of 1968 has been conducted and the results are in. What is to be done? As suggested at the beginning of this article, if recent history is a guide we will first wish the results the death of silence. Pretend they do not exist. If that fails, then yell and scream and call names. Outrage at insensitivity; heap acrimony upon ad hominem.

The unfortunate truth that no-one was particularly hoping for is completely at odds with the revealed wisdom of the egalitarian left: When black babies are adopted into middle class bright white families they grow up to function intellectually like blacks. Less clear is what happens emotionally and in terms of personality adjustment. Whatever, there is no evidence that either the white children or their black adopted siblings grow up better adjusted, and there might be substantially more social deviancy and psychopathology than without the mixed-race adoptive experience. These data are consistent with a large and growing body of other findings.

In a rational civilized and civilly humanitarian culture there might be a call for further investigation and study of the implications of the best scientific information that is available. In a civilization that is experiencing a phase of irrational ideological zealotry the response would be quite different.

In 1961 a president of the American Psychological Association, Henry Garrett, called the egalitarian dogma that blacks and whites are genetically equal in cognitive ability the "scientific hoax of the century" (Garrett, 1961). In 1967 the Nobel laureate William Shockley lamented the "entrenched dogmatism of inverted liberals" that prevented open discussion and unbiased research (Shockley, 1967). In 1995 the sociologist Robert Gordon referred to the "degradation ceremony" which is held to heap acrimony on anyone who deviates from "one-party science" (Gordon, 1995). The Canadian psychologist J. Philippe Rushton has experienced attempts to criminalize him because of his research (Whitney, 1996). Charles Murray in his "afterword" for the 1996 soft-cover edition of *The Bell Curve* opines "The social science that deals in public policy has in the latter part of the twentieth century become self-censored and riddled with taboos - in a word, corrupt." (Murray, 1996, p. 575) The inquisitorial zeal with which the secular priesthood attacks any apostate from the egalitarian fiction would be ludicrous if the consequences were not so serious.

Science and Socialism

The current state of affairs in the social sciences is not unprecedented in recent scientific history.

The conditions of soviet science under socialism are only just now becoming known in the west. There have been a spate of books, one is the 1994 *Lysenko and the Tragedy of Soviet Science* by Valery N. Soyfer (translated by Leo and Rebecca Gruliov). Under socialism, the genetics that forms the basis for individual and race differences was first attacked, then ridiculed and essentially outlawed as an anti-egalitarian invention of Western capitalists that was inherently evil because it was inconsistent with Marxist-Leninism. In America *The Science and Politics of IQ, or Not in Our Genes, or Ever Since Darwin will give you the flavor* (Gould, 1977; Kamin, 1974; Lewontin, Rose & Kamin, 1984). The absurd anti-factual structure which developed was able to dominate all of the biological and social sciences in the Soviet Union and its client states for a period of decades. This perversion was not the work of any one man, not the great Lysenko, rather it required the active involvement and support of many of the leading scientists and intellectuals. It is a fundamental structural flaw of socialism, to claim to establish reality on the basis of the scripture according to Marx. Genes and heredity did not influence differences between individuals, or races, or eventually even species. Instead, conditions of rearing were all-important. Everyone knows fertilizer is important, so manipulate the early experiences of the puppies in order to change their development. "Vernalization" was the name for one sort of head start program, sure to transform winter wheat into spring wheat. No need, or time for basic research, there was a pressing national need that called for intervention now. So, throw money at nice-sounding intervention programs. Then, without evaluation introduce nation-wide applied programs. Discourage any mention of genetics - it represents the Hell of Capitalism, the Devil's work in total contrast to the Paradise of Egalitarian Socialism. Inheritance and genetics is Nazi-tainted evil; its practitioners must be despicable racists. When one program after another fails, simply give them more rubles, or quietly close them down while touting with much fanfare yet another enrichment. It is truly scary; the parallels between Soviet practice under socialism and environmentalist - egalitarianism in American social policy. Egalitarian agriculture and the food shortages it caused played no small role in the demise of the Soviet Union.

Soyfer says it well:

In any society, there are charlatans and people who are simply mistaken. They may try to deceive their fellows, either by design or out of ignorance. But in a healthy society, others will call attention to their errors, test their assumptions, and make objective appraisals. Shams are exposed, and no one punishes those who do the exposing; members of the government or secret police do not hurl political accusations against seekers of scientific truth. But that is what happened when an alliance of the Lysenkos, the Stalins, and the Berias was part of the onrushing, bloody chariot of socialism.(p.300)

One of Professor Shockley's suggested experiments has been done and the results are in. Now after 30 odd years and over \$5.4 Trillion dollars, perhaps it is not too late to dust off some of his other suggestions.

The Human Situation and its Reparation

by Robert Klark Graham

A great drive toward higher intelligence began when the very early precursors of man began to walk erect. This freed their grasping forelimbs from use in locomotion and made them available as hands, as implements of the mind. Of the mammals only those ancestral to man walked fully erect.

During the next approximately 3 million years the human brain trebled in size. This was one of the most remarkable developments known and it gradually brought into the world a new force: the power of high intelligence.

"The human brain is the most complicated mechanism in the universe. Crammed within its relatively small volume of 1.5 liters are billions of individual neurons, many of which receive tens of thousands of connections from other neurons. The neuronal wiring in the brain is genetically determined."

The gains in brain size and intelligence continued within the ancestral line of hominids throughout almost its entire hunting stage. It culminated in the tall, powerful, intelligent Cro-Magnons and their cognates, regarded by anthropologists as the most impressive creatures nature has produced. Cleland commented, "The Cro-Magon Brain was much larger than the average of today. It was a superb race both physically and mentally." Kroeber agreed, "The size and weight of the brain of the early Cro-Magon people was some fifteen percent or twenty percent greater than that of modern Europeans." Humankind never again reached such a state of average excellence.

Apparently this peak was reached only by the early Cro-Magons. Later generations of these same peoples were not quite the equal of their forebears. Their workmanship was less admirable. This was the first known regression in the development of our kind. There is reason to conclude that increasing control of the environment (including fire, shelter and weapons) weakened the intensity of natural selection until less endowed individuals could survive in debasing numbers.

With the ending of the latest Ice Age, about 11,000 years ago, agriculture became possible. Given the warmer climate and the relative abundance which food production provided, man redoubled his numbers again and again until he had cities and then civilizations. Types which never could have survived by hunting in semi-glacial wilderness now multiplied prodigiously. This great quantitative gain produced some qualitative loss. Over time the average brain, once 1500 cc., regressed to less than 1400 cc.

With increased numbers and increased leisure the creative segment of society began a whole series of dazzling accomplishments. They invented the wheel, writing, the smelting of metals and more. Although now in the minority, there are probably more creative individuals in the populous world today than the Cro-Magnons could have mustered at any one time. Cultural accomplishments can still accumulate while the innate condition of man regresses.

Since the beginning of agriculture there have been twenty-six identified civilizations. They include the Egyptian, Babylonian, Greek and Roman. Every one of them broke down or died out excepting so far only the youngest our own. Why were they not self-sustaining?

A common factor, which appeared in the late stages of many of these failed civilizations, was the gradual dying out of their abler peoples, the types who had initiated the civilizations and might have sustained them. They failed to reproduce sufficiently. Consequently their civilization died out at the top and their society became unable to cope with problems it once could have surmounted, including invasions.

The tendency of civilized life to sterilize its ablest citizens...is the experience of nearly all countries which enjoy even a passable degree of prosperity...For example, the earlier Roman emperors were continually in difficulty because of the extinction of the senatorial families, which were the class whose administrative ability had been so largely responsible for the creation of the Roman Empire."

Today there is a specific remedy for this chronic affliction of civilization.

A normal woman whose childbearing is not restricted will have an average of 15 live children. 1.8 is the present reproduction rate of our more able citizens (European and American). This is significantly below the 2.1 rate necessary for them just to maintain their numbers. This failure of the most able segment is even more serious when we realize that 4.1 is approximately the reproduction rate of the exploding world population today.

How did this happen? Possibly from observing the behavior of domesticated animals, someone deduced the cause of pregnancy. Discovery of the cause led to ways to prevent it. Ever since, the more capable members of society have been more effective than the average in the prevention of pregnancy. When they reduced the pregnancies of their own kind below replacement level, they exerted an especially sinister influence on human quality. No civilization survived long once this destructive morbidity set in. ("Extinction from within," Spenger called it.)

Late in the development of our Western civilization we see evidence of regression for the twenty-seventh time. We live in a nation desperately in debt. It no longer maintains its borders as it once did. Crime worsens. The SAT scores have declined. There is evidence that the genetic component of human intelligence has declined measurably in recent generations. Some

authorities estimate that the decline is not less than one IQ point per generation.

For thousands of years our kind has borne the gradual weakening of natural selection. We have also endured world wars which killed millions of the best of young manhood before they could reproduce. It has seen the proletariat kill millions of its own intelligentsia and bourgeoisie. It sees a nation paying indigent females to bear millions of largely non-self supporting offspring. Most sinister of all, today it suffers the gradual elimination of the intelligent by the intelligent themselves- -a direct negation of the natural selection which once built our brain.

It is not to be expected that we stand unhurt by massive dysgenic catastrophes such as these. The details are not all known but the evidence is stark. Where it counts most, man has lost more than 100 cubic centimeters of brain mass. There are about 600 million fewer brain cells than there used to be. The brainy creature is squandering his capital. We are still the dominant creature. We overpopulate the earth. But we are no longer an upwardly evolving organism.

Why must humankind achieve great civilizations repeatedly, only to fall back into decline more than twenty times? Has man reached a limit? Must he continue as a physiologically declining organism? The answer depends on the character of the lives yet to come and over this we have some influence.

The reproductive deficiency prevalent today among the leaders, the savers and investors, the entrepreneurs, producers and professionals, is not due to infertility. It is due to suppression of their fertility. If instead, more of this fertility were released, many of our gravest problems could soon be ameliorated. Encouraging the procreative impulse where would do the most good could be decisive.

Man can be improved gradually by increasing the proportion of advantageous genes in the human gene pool.

The situation is complex but its remedy is straightforward. It is contingent on many of the healthiest and most intelligent women having more children by the healthiest and most intelligent men. If this can be accomplished abundantly, as in former times, it will conserve and multiply our most valuable genes. It will lead to more good families, to preservation of our great civilization and even to humanity resuming its evolution into increasingly competent beings.

One of the ways to accomplish this elemental healing would be for society to recognize widely that the more intelligent you are the more children you should have. This simple, basic principle is mankind's opportunity. It could do for us what natural selection formerly did, without natural selection's cruelty. Learned in childhood, understood and lived up to, this would put mankind back on the path of upward evolution.

Specifically, if you are in good health and your intelligence is substantially above average, you should have at least five children. A family of five bright children is really one of the greatest blessing a man and woman can have in their lifetime. When you can give to children the most lasting, the most persistently satisfying, the most all around useful of natural endowments- -a really good mind- -give generously. This giving does not deplete your fund.

We need the finest counsel to bring about wide recognition of this powerful source of reparation, for the sake of all and especially for the generations to come.

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14. 5 is smallest whole number above the population's average of 4.1.

The Writer addressing you is ninety-year old Robert Klark Graham, still driven by a passion for a better world. Graham is co-founder, with Nobelist Hermann J. Muller, of the ongoing Repository for Germinal Choice ("genius sperm bank") and developer of the modern hard resin ophthalmic lens, now replacing fragile glasses worldwide.

The Consequences of Variable Intelligence

By: Tatu Vanhanen

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Human Intelligence and National Power: A Political Essay in Sociobiology

Seymour W. Itzkoff

New York: Peter Lang Publishing, 1991.

The Road to Equality: Evolution and Social Reality

Seymour W. Itzkoff

Westport, Connecticut: Praeger, 1992.

The Decline of Intelligence in America: A Strategy for National Renewal

Seymour W. Itzkoff

Westport, Connecticut: Praeger, 1994.

Seymour W. Itzkoff argues in his three books published in 1991-94 that there are significant hereditary intellectual differences between individuals and groups and that as a consequence of this variation there are very large differences in educability, social status, and economic achievements of individuals and groups. According to him, intelligence is part of each individual's inheritance, as much as one's height and personality. Therefore,

"the issue of intellectual variability in humans and the consequent variability in average intelligence between groups of individuals, and their ethnic, racial, religious, and national identities, is the Copernican problem of our time" (1991, 10).

He challenges the egalitarian dream of socialists, sociologists, and liberal egalitarians, according to which intelligence is uniformly distributed in all populations and all humans were equal to any social and intellectual task if only they were not held down. Itzkoff points out and enumerates great failures of social policies based on these unrealistic views of human nature. The theme is the same in all three books, but he discusses it from different perspectives.

In *Human Intelligence and National Power. A Political Essay in Sociobiology* (1991), he focuses on the evolution of human intelligence and the emergence of intellectually different human groups, as well as on various consequences of the variability of human intelligence, including the European florescence, the failure of communism, the rise of Japan's power, the decline of the United States, and the Third World debacle. He emphasizes the significance of intellectual homogeneity in ethnically homogeneous nation-states and examines the ways to raise the level of general intelligence "g".

In *The Road to Equality: Evolution and Social Reality* (1992), Itzkoff focuses on the failure of Marxists and liberal egalitarians to create an egalitarian and classless society and argues that their basic assumptions of human nature were wrong. They failed to recognize that human beings are endowed with differing quantities and qualities of intelligence and that the same concerns ethnic groups. From this perspective, he examines the hallucinations and misfortunes of our evil century, the methods to achieve classlessness and to end oppression and degradation, the ethic of intervention, the democratic quest, essential feminism, the mysterious ethnicity, and the significance of the wealthy. His message is that America's social dilemmas are in part due to hereditary intellectual differences between individuals and groups.

In the latest book, *The Decline of Intelligence in America: A Strategy for National Renewal* (1994), Itzkoff analyses the problems and social pathologies of America and claims that they are related to the decline of general intelligence. His central idea is that new generations are coming from the lower end of the intellectual, and thus the social, scale. As a consequence, a population of permanently poor Third World Americans is emerging. In the second part of the book, he recommends policies intended to turn the trend. The solution proposed in this book is simple: the government should stimulate the finest to form families of the traditional sort in which children are conceived, born, raised, and educated to the highest levels for which they are capable, and the helpless should be encouraged and guided not to have children that they cannot rear and educate to functional cultural levels.

The problems analyzed in Itzkoff's books are extremely important. He has had courage to take up issues that have not been discussed because it has not been politically correct to assume that

there might be intellectually different human groups and that social inequalities might in part be due to variable intelligence in humans. It has been difficult even for evolutionary biologists to accept the idea that humans vary in general intelligence (see, for example, Gould 1981; Lewontin 1982). Even more difficult it has been to accept the claim that there are hereditary intellectual differences between ethnic groups (see Vine 1994). I try in this essay to tell about Professor Itzkoff's central ideas, arguments, evidence, examples, and renewal proposals and to evaluate the practical significance of his theoretical insights and reform proposals.

The Evolutionary Roots of Intellectual Differences

Let us start from his central idea concerning hereditary differences between individuals and groups. How to explain the origin of assumed group differences?

He traces the origin of intellectual variability of human groups to the geographical dispersion of early humans and to the variation in their environmental circumstances. According to him, *Homo erectus* originated in Africa, but it possibly split into modern geographical races of man already one or 1,5 million years ago when some groups emigrated from Africa to the other Old World continents.

At this stage of human evolution, from about 1,5 to 0.5 million years ago, various groups of humans, whether races or ethnic groups, seem to have had similar levels of intelligence. There were not many differences in tools used by them. However, after 500,000 B.P., a revolution begins to occur in the North, in Europe and western Asia among Caucasoids during the Pleistocene Ice Ages. Intelligence helped the survival of people in harsh and variable environmental conditions. High intelligence was useful. The average brain size and intelligence increased in Caucasoid populations through natural selection. He says that

"in the challenging environment of the north, a big brain had extraordinary selective value. These humans could think deeply and analytically" (1992, 37).

Finally, about 35,000 B.P., Cro-Magnon appeared in Europe. His assumption is that *Homo sapiens sapiens* evolved in Europe as a consequence of adaptation to harsh and variable environmental conditions:

"the northern quadrant of humanity subject to the flow and ebb of the glaciers inhabited a far more challenging and dangerous environment than those living in the tropical south" (1991, 194).

There was not similar pressure for intellectual evolution among the human populations living in "millions-of-years-old tropical garden of Eden." Consequently, northern populations achieved a higher level of general intelligence than tropical populations.

Itzkoff assumes that the ability of large-skulled, adaptively able northern sub-species of Homo to handle this ferocious Ice-age environment and even prosper probably forced them to migrate for more space. Over the period of 150,000 years, they moved east and south and spread their genes. He further assumes that

"modern blacks originated in Western Africa after 10,000 B.P. as a result of mixtures between indigenous proto-Negroids and Pygmies, and incoming Caucasoids" (1991, 40).

[As a consequence,]

"Negroid and Caucasoid races have biologically more in common with each other than they do with any of the other races" (1991, 42)

The original Mongoloid descendants of Homo erectus pekinensis along the Yellow River Valley also absorbed a steady stream of Caucasoid wanderers across the Siberian and Kazakhstan plains. The same concerns the Koreans and Japanese,

"who speak a Uralic/Altaic language related to the hybrid Siberian steppe peoples and thence to the Estonians and Finns" (1991, 42).

[In this way the Cro-Magnon people wandered from their unknown Eurasian homeland to the other parts of the world]

"hybridizing with the existing transitional erectine-sapiens humans all over the world."

[The New Guinea, Australian and Tasmanian Australid populations are possible exceptions (1991, 18, 39). Today's]

"racial divisions are the remnant memories of ancient human separations that go back several million years" (1992, 7).

This is a very interesting assumption on the origin of intellectual differences between human populations and of geographical races. It differs radically from interpretations, according to which the evolution of modern people took place in Africa.

C. B. Stringer, for example, claims that

"all living people are closely related and share a recent common ancestor who probably lived in Africa. From that African ancestral group, all the living peoples

of the world originated. "

He continues that the ancestors of Europeans, Asians and the populations of the American and Australian continents probably share common ancestors within the past 60,000 years. This idea does not presuppose any significant intellectual differences between human populations. In fact, Stringer emphasizes their similarity:

"What is certain is that the early modern peoples of each part of the world were all similar in basic anatomy and behavior, but regional differences in physique and culture rapidly developed subsequently" (Stringer 1992, 249. See also Howells 1992; Ritter 1981, 98-101).

Stephen Jay Gould, similarly, assumes that *Homo sapiens*

"is tens of thousands, or at most a few hundred thousand, years old, and all modern human races probably split from a common ancestral stock only tens of thousands of years ago" (Gould 1981, 323).

Izkoff's assumption differs from the "Out of Africa" hypothesis in two important points: (1) he claims that human populations have racially differed from each other one or 1.5 million years, although there have been new mixtures later on, and (2) he provides a plausible explanation for the origin of intellectual differences between human populations. The alternate hypothesis would be unable to provide any explanation for intellectual differences between the northern and tropical populations. The crucial question is whether such differences really exist.

General Intelligence "g"

Izkoff's claims that individuals vary in intelligence and that such variation is principally due to hereditary factors. What kind of evidence does he provide to support this claim?

He refers to intelligence tests (I.Q.) that have been carried out in various countries since the beginning of this century. They indicate consistently that humans vary in intelligence. A heated debate has continued on the question whether such variation is more due to hereditary or environmental factors and whether there is any "general intelligence" that could be measured (see Gould 1981; Lewontin 1982; Izkoff 1987).

Izkoff refers to evidence of the existence of general intelligence "g" and of its hereditary character. According to him, 50-80 percent of general intelligence seems to be due to hereditary factors. Innumerable studies of monozygotic and dizygotic twins have provided evidence on the hereditary nature of intelligence. For example, he says,

"identical twins reared apart in differing life circumstances are much more similar intellectually than fraternal twins reared under the same roof" (Itzkoff 1987, 142; cf. 1991, 27).

[Worldwide studies of sibling adaptation, he continues,]

"regardless of the race or ethnicity involved, reveal that a sociologically uplifting environment has no long-term impact either on the personality or the intellectual profile that the children bring with them from their biological heritage" (1992, 88).

The results of these studies also imply that the genetic variation in intelligence depends on a relatively small number of genes because the possible variability between even closely related individuals seems to be enormous (see 1992, 31-32; 1994, 101). Itzkoff comes to the conclusion that it

"should be clear to all but the most ideologically and theologically devout environmentalists that human achievement and personality have a dominating biological and thus hereditary component" (1992, 31).

I think that it would be difficult to disprove his argument that human intelligence varies and that hereditary component is dominating in this variation. If we accept the argument on the hereditary intellectual differences between individuals, it becomes difficult to deny the possibility that there might be hereditary intellectual differences between ethnic groups, too.

This is a much more inflammatory proposition than the claim of individual intellectual differences. Everybody has probably made observations of great individual differences in intelligence, but it is more difficult to make observations of the average intelligence of ethnic or racial groups. Therefore, it has been easy to deny the existence of such differences and to argue that there cannot be any significant differences in the average intelligence of ethnic or racial groups. And if all human races separated from a common ancestral stock in Africa only some tens of thousand years ago, it would be difficult to find any plausible explanation for the emergence of such differences. However, Itzkoff has a plausible explanation for the origin of intellectual differences between human groups, as mentioned above, and he provides data that indicate the existence of such differences among contemporary ethnic groups His evidence is based on the consistency of the results of intelligence tests (I.Q.) carried out in many countries.

According to the results of intelligence tests given in his books, the average I.Q. for American whites is 100, for African-Americans 82-85, for Hispanics somewhere in between, and for native Americans in the low to mid-90s, whereas it is 103-107 for Japanese and probably more than 100 for Han Chinese, too. Itzkoff stresses that they are ethnic groups that differ from each other in intelligence, not racial groups, but, on the other hand, he emphasizes the difference

between northern and tropical populations. In general

"the northern peoples of the world, the residue of the original Caucasoids and Mongoloids have more on average brain power" (1992, 50).

This is probably the most controversial part of his argumentation, but because his conclusions and policy recommendations are based on it, those who disagree with him should try to show that he is wrong. It is not enough to say that it is not politically correct to make such propositions. In open society, people should be prepared to discuss and examine also the ideas that contradict their own convictions and belief systems.

Itzkoff provides additional support for his thesis from empirical data on educational and economic achievements of different ethnic and national groups. According to him, it was natural that the technological civilization emerged in the North, in the area of Caucasoid Eurasians. The present great economic inequalities between the north and the south are related to intellectual differences. Therefore, it has been difficult to equalize economic conditions between the industrially developed north and the Third World countries. It has succeeded only in the parts of the world where national ethnic groups have been intellectually approximately equal with Caucasoids. This concerns particularly northern Mongoloids, Japanese, Koreans and Han Chinese.

On the other hand, development aid from the north has not been enough to generate and maintain technological development in Africa. Itzkoff finds further evidence for his thesis from the fact that all immigrant groups have not succeeded equally in America. According to his data, more intelligent ethnic groups have succeeded much better than less intelligent groups.

Social Consequences

We come to the social consequences of variable intelligence. They are enormous. For example, Itzkoff refers to many types of social facts and problems connected with variable intelligence in humans. He argues that social inequalities are persistent because humans vary in intelligence. He accuses the ideology of egalitarianism for the genocides and holocausts of this century. Communists killed tens of millions of people of higher intelligence to further equality. The failure of communism was caused, according to his interpretation, by their erroneous assumption that intelligence is distributed homogeneously among individuals. They believed that the masses could easily be educated to fill the vacuum created by the destruction of the bourgeoisie establishment.

It was not so. Marxists had forgotten Marx's refutation of those sections of the Gotha Program (German socialist parties) that asserted the absolute uniformity of human abilities. Marx himself believed in the existence of intellectual differences in human beings.

Itzkoff further argues that Japan's economic success story has been powered by the high intelligence of the ethnically homogeneous Japanese people. Because of universally high intelligence of its ethnically homogeneous population, the Japanese state does not need to subsidize any permanently "catch-up" portions of the nation, and because there is a rich supply of talent ready to step in, the salaries of executives remain relatively low. In Japan, the average chief executive earns about eight times the average of his workers; in the United States the average chief executive earns about 160 times the worker average (1992, 152).

Itzkoff presents an extremely inflammatory and important explanation for the failure of modernization in most parts of the Third World. According to his assumption, it is due to clear differences in average intelligence between the northern and southern populations. Northeast Asia, including mainland China, Taiwan, Hong Kong, Singapore, and South Korea, are rapidly rising from war and political chaos because of the high intelligence of their populations, whereas in Africa, Central and South America, and many parts of southern Asia, the pace of modernization has been at best slack. Many hundreds of billions of dollars in loans have simply gone down the drain in corruption and incompetence. The reason for the Third World debacle is in the fact that the level of intelligence is lower in the tropical south. He supports this assumption by the experiences gathered from minority populations of the tropical south living in the north. Some members of such minorities thrive and prosper, but the majority falls into despair.

On the other hand,

"ethnic Han Chinese living in either Indonesia, Malaysia, or the Philippines achieve at levels parallel to their Chinese compatriots in the U.S. or Hong Kong, despite extensive negative discrimination." And Japanese, Germans, and Italians born in Brazil achieve as their confreres do in their respective homelands (1991, 195).

The Decline of the United States

The major problem examined by Itzkoff concerns the decline of the United States and its causes. He complains of the lack of open discussion and warns that never

"in history has a society that has blocked the open search for truth survived to prosper. "

[In America, the intellectual leadership of the great public media institutions and the universities has effectively handcuffed the elected political representatives and prevented them from considering solutions:]

"The taboo word is, of course, race. Because so much of our internal tragedy does involve the minorities of color, the stereotyped excuse is that discussions about biological intelligence and the variable behavior that it elicits will militate against the interests of these minorities."

[He does not accept this argumentation, and he tries to show that it is in the interest of all Americans to think deeply]

"about this reality of variable human intelligence and whether there might be a connection between this issue and the fact that our national profile is sinking so rapidly" (1994, 6).

What does he mean by "decline of the United States?" Itzkoff claims that this decline

"can be confirmed by any of the criteria that historians have ever used to measure the state and condition of a nation and its people" (1994, 3).

The indicators of decline used by Itzkoff include the rise of criminality in American cities, the status change from a great creditor nation to the world's largest debtor nation, the enormous loss of high-wage jobs, the fact that some 50-80 percent of the workforce is not able to work and produce at an internationally competitive level, the decline in educational standards and achievements of the public schools as indicated by the quarter-century decline of SAT (the Scholastic Aptitude Test) scores, social disintegration, and the expanding poverty populations at the bottom of society. It seems to me that he has presented enough empirical evidence on the decline of the United States compared to Japan or to some European nations.

Itzkoff explains the economic and educational sinking of the United States by the decline of the average intelligence. The welfare policies encouraged the poorest, least capable sectors of the population, from all the races and ethnic groups to have children. However, he does not provide much statistical evidence for his claim that poor sections of the population have produced relatively more children than more wealthy and educated ones. It is not self-evident that this claim should be true.

According to sociobiological theories, wealthy and dominant sections of the population are expected to have been reproductively more successful than poor ones, at least until modern times (see Betzig 1986; Rogers 1990, Roskaft et al. 1992). Therefore, I would like to see more statistical evidence. One example, to which he refers, concerns the blacks. The proportion of black citizens in the U.S. grew from 9.8 percent in 1940 to 12 percent in the mid-1980s.

Itzkoff sharply criticizes the welfare-policies that have produced a new human zoo. He says:

"Like animals whom we now have trained to reproduce in captivity, there is a new and growing class of Homo sapiens living within the ostensibly modern societies."

[He assumes that even Marx would look at this new and classically unrecognized situation with horrified wonder:]

"What he would see would be the public welfare hospitals where they are born, the flocks of social workers who minister to their dole, the Head Start teachers, then the special education and remedial classes in the state schools, the drug clinics, probation officers, public health nurses, the police and the jails, the crime-ridden public housing projects, the food-stamps, the underground subways, bus terminals, and railway stations and the spaces over the heating vents on the public streets that serve as sleeping places, the municipal hospital emergency rooms, and then the AIDS wards and hallways where they die" (1992, 90-91).

On the other hand, the invention of "the pill" and feminist ideas decreased the birth rate among educated and more intelligent sectors of the population. Liberal equalitarians told the people that it was not important who had the babies. The children could easily be educated to high levels of social productivity, they preached. To the educated classes,

"both men and women, they urged liberation, careerism, and material consumption, heaven forbid conceiving, bearing, and raising large families" (1992, 91).

[As a consequence,]

"the United States mean I.Q. has dropped about five points over the last several generations, the result of this differential birth rate" (1991, 163-187).

Briefly stated, Itzkoff argues that the poor and intellectually lower sections of the population have been reproductively much more successful than the wealthy and more intelligent sections of the population and that it has caused the fall of national intelligence. He estimates that already by 1994, roughly half of the American population can be seen to be sinking below international levels of intellectual and educational achievement needed to maintain competitive production. And he asks, what is "to become of these individuals, and then of the formerly wealthy nation that encouraged their coming into being?" (1994, 107). He assumes that they will be pushed deeper and deeper into the culture of poverty. What to do?

Remedies Proposed

Professor Itzkoff argues that because social pathologies and other problems of the United States have been aggravated by the decline of general intelligence of its population, the best remedy would be to increase the level of general intelligence. He stresses that it is not a purely racial or ethnic issue because those at the bottom of the intellectual pyramid come from all groups, white, African-American, Latino, and others. It is clear, however, on the basis of his books that the problem focuses on African-Americans and other ethnic groups originated from the south.

The remedy proposed by Itzkoff is simple: the most intelligent and educated men and women should bear and raise many more children than those from the bottom of the economic and educational social class structure. Besides, the traditional nuclear heterosexual family should be saved. He accuses liberal egalitarians for hating monogamy and the nuclear family:

"They fear and despise men as heads of household, and thus with a woman actively raising her brood of children in the home, the kids not out in day care or with illegal aliens acting as 'foster' parents. The idea that males and females differ in any important bio-cultural manner, physical or intellectual, is anathema to their unisex ideology, and their despising of historical male and female values."

[As a consequence of liberal policies, Itzkoff continues, we]

"have lost the children of almost two generations of our educated and liberated women. It has had almost the same effect as if it had been genocide" (1994, 126, 133).

According to his interpretation, it will depend on the policies of the government whether the reproduction trends change to the proposed direction or not. The government should pass

"social policy legislation aimed at creating inducements, as well as legal protections, that will lead to the wealthy and successful having more than their share of children and the poor limiting their procreative activity in the interest of their own individual social and economic aspirations" (1992, 160).

The prescription is clear, but it seems to me that he does not yet have any clear idea what such "social policy legislation" should include and how the government could carry out such policies. However, he makes some proposals.

- * First, people should be reeducated.
- * Second, job priorities should be given to married men with families.
- * Third, all births should require the identification of the father.

* Fourth, men and women at the top of social scale without children should be punished through the tax system.

The government should try

"to establish a long-term social policy that will `encourage' the birth of 50 percent more children from the upper half of the social and income brackets than from the lower."

[It is not clear how it could be done, although he says that we]

"must persuade the potentially parasitic classes at the top and at the bottom of society to act appropriately. The wealthy educated will have to validate their socially acquired assets by bearing their own offspring or adopting needy children. Those at the bottom should be humanely persuaded, with generous gifts if deemed appropriate but for one generation only to refrain from conceiving and having children" (1994, 192-195).

Itzkoff makes several other interesting reform proposals. I refer to only two of them. He would like to decrease the relative number of African-Americans because their average level of general intelligence "g" is low. The discouragement of illegitimate births would serve this purpose.

On the other hand, he suggests that the "talented tenth" of the African-Americans should produce many more children than the less intelligent majority. In this way it would be possible to raise the general intelligence of the African-American minority.

Besides, the United States should change its immigration policies radically. No more illegal immigration, he says, and

"those who are here in violation of our laws, along with the children that have been born here in the interim," must return to their homelands (1994, 161).

Only talented people, irrespective of their race, should be allowed to immigrate to the country.

Itzkoff is deeply worried about the declining intelligence in America because he would like to retain his country among the first class nations in the competitive world of the twenty-first century, which is not possible without a highly intelligent population. America's crisis is a natality crisis, he says, but the leadership of the United States is indifferent to this issue. It does not care who is having the children.

Discussion

I agree with Professor Itzkoff in most points of his analysis. Evidently humans vary in intelligence, and this variation is principally due to hereditary factors. He has convinced me that ethnic groups may also vary in general intelligence "g". I agree with him that social consequences of intellectual variability are enormous and that they can be seen in all areas of human life. The origin of social inequalities is in the fact that humans are not similar in their intelligence and other capabilities. It is also quite probable that a significant part of the persistent poverty in the Third World is related to intellectual differences between ethnic groups. He is probably right in his central assumption that the level of general intelligence would increase if the upper half of social and income brackets could produce 50 percent more children than the lower half. The problem is how to get people to follow his advice.

According to the sociobiological inclusive fitness hypothesis, all organisms are programmed to further their own reproductive interests and not to concern themselves about others (see, for example Dawkins 1976; Alexander 1980). Therefore, I assume that it would be extremely difficult or impossible to persuade the members of any minority ethnic group to sacrifice their own reproductive interests for the assumed higher interests of the nation.

It might be possible to achieve some results by economic and other inducements, but it is quite possible that coercion and even force would be needed to achieve substantial results. Itzkoff has not proposed or discussed the use of coercion, although he proposes that the births should be reduced at the bottom of the social and economic scale and that all births should require the identification of the father. Is this a case in which the government might use coercion and even force to carry out its family policy?

If the father cannot be identified and made responsible for the child, the state might require the prevention of the birth by compulsory abortion. However, if coercion and force become necessary to prevent the births of unwanted children, we have to ask whether the aims are worthwhile enough to justify such policies. Is the maintenance of intelligence so important that it justifies the use of coercion and force against women who break the legal rules of reproduction? I do not know, and Itzkoff has not discussed this problem. It should be discussed because I do not believe that his radical reproductive reforms could be carried out without coercion.

It is true that African-Americans are at the bottom of the social and economic scale, but I would like to point out that they have not been losers in the Darwinian struggle for existence. In fact, according to the data given by Itzkoff, they have been even more successful than the whites because their relative number has increased in the United States since the 1940s. It means that in some way they have become better adapted to their social environment than the white majority. Despite their poverty, they have borne and raised children more than their share, whereas many wealthy and educated and probably also highly intelligent whites feel themselves

so poor and insecure that they cannot afford to have children.

We should remember that in the Darwinian struggle for existence reproduction is the only criterion of success, not wealth, education, or intelligence. By this criterion the American blacks have been more successful than the whites.

Izkoff has brought into discussion the issue of variable intelligence in humans and indicated through extensive evidence and examples its crucial importance in national and international politics. I think that it is time for us to take biological factors seriously and examine their relevance from various perspectives.

As Izkoff says, the scientific evidence for the biological roots of our social behavior continues to accumulate (1994, 5). It is becoming clear that environmental egalitarians were wrong in their traditional assumption that human behavior and social structures are principally, if not completely, shaped by our environment. Human nature matters probably more than we can imagine. Izkoff has focused on one very important aspect of human nature, to hereditary intellectual differences between individuals and groups, and he has disclosed its social and political relevance in superb manner.

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Why Race Matters: A Review and Extension

Why Race Matters: Race Differences and What They Mean by Michael Levin, Westport, Praeger, 1997.

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Levin's new book, *Why Race Matters*, is probably one of the most politically incorrect books of recent years. It argues both that there are racial differences in ability and personality, and that these differences matter for public policy. Professor Levin's views have been controversial for years, and he has successfully defended in court his right to express them.¹ The book is organized into three major sections. The first documents that differences exist and that they are genetic. The second and third discuss why these differences matter for economic and social policy, hence the title of *Why Race Matters*.

The empirical evidence for racial differences is strong, although seldom discussed in the academic literature, being often dismissed as due to stereotypes. Levin deals with the stereotype issue, asking why over the centuries certain beliefs about race have prevailed. The simplest answer is observation; the traits have been repeatedly observed. A summary of the data on intelligence describes the differences between races.

As a professional philosopher, Levin frequently focuses on issues of definition and logic. As an example of Levin's style he says (p. 51), "Calling athletic ability. . . 'intelligence' no more changes the intelligence of athletes, . . . than call dogs 'horses' will make them whinny. The world is what it is no matter how it is described. That is why, when dispute focuses on a word, the word is best dropped and the facts restated without it. Should someone insist that whether Albert Einstein or Babe Ruth were equally intelligent is culture-relative, it is best to say that Einstein was better . . . at abstract reasoning, and Ruth better . . . at hitting baseballs, whatever these traits are called."

Levin points out how many who "make a point in argument of not understanding 'intelligence' invariably understand it in all other contexts." One of his examples is how Gould (who pretended not to understand the concept) who in his book *The Mismeasure of Man*² asserts that psychometricians had "reified" intelligence. But Levin points out that whether an abstraction like intelligence is useful depends on whether it correlates with other variables of interest, and that intelligence does meet this criterion. Speaking as a philosopher, Levin points out how positivism or operationalism (the idea that concepts have no meaning beyond the operations used to measure them) has become unpopular in philosophy of science circles. As he puts it. "At

the present time, an objection like 'IQ tests predict' but so what? would be dismissed as doctrinaire in any context other than psychometrics. Nobody belittles Maxwell's equations by saying 'they predict radio waves, but so what?' Radio waves are taken to show the existence of the fields these equations describe. Likewise, the correlates of IQ are important, not because correlation exhausts scientific knowledge, but for the opposite reason, that they indicate the underlying reality.

Having argued that intelligence is a meaningful concept, Levin then goes on to deal with the evidence for racial differences and related questions. He takes up test bias, and the claim that the racial differences are only due to the tests being biased.

Taking Gould on again, Levin points out that even Gould³ agreed that tests are not biased against blacks in the statistical sense (as Levin points out, this admission is in effect a retraction of Chapter 5 of his earlier 1981 book), but argued that people are really interested in whether "blacks average 85 and whites 100 because society treat blacks unfairly." This is replacing the usual meaning of bias with a new question. As Levin points out repeatedly, an effect can be real but unjustly caused, and whether or not an effect is real, and whether it is justly caused are logically separate questions.

He presents evidence that tests predict academic performance, and job performance, as well for blacks as for whites. Interestingly, black performance is usually over predicted, not under predicted. Given the same test score, the blacks typically perform worse on the job or in employment.

There are a number of reasons for this. As was pointed out in this journal⁴, Bayes' Theorem implies that the best estimate of the true ability of a person will be a suitably weighted average of their ability as tested, and the average ability of the group. This theorem has the politically unfortunate implication that when seeking the best employees, those from a low scoring group should have points deducted. Levin cites the working paper version of this, but due probably to the time delays between the first drafts of his book and its final publication, failed to update the reference.

As to evidence that the tests are unbiased it is found that blacks lag whites by about two years in their performance on tests and Asians by three years, but that the nature of the errors made (and the relative difficulty of the questions) at the same level of mental ability are similar.⁵ If differential exposure to "white culture" is the problem, the nature of the errors made and the relative difficulty of questions would vary greatly between the races, but they do not. Also, while it is plausible that blacks are exposed to a somewhat different culture than those (typically middle-class whites) that make up the tests, the Asians are even more culturally different and yet outperform whites.

The racial difference in IQ is well known to specialists (even if not to the media) and well

discussed by them. There has been less attention paid to racial differences in personality. Levin describes two of special interest.

One concerns self esteem. Contrary to popular belief, studies show black self esteem to typically be higher than that of whites. The wide spread belief to the contrary among the intelligentsia may be because these people believe they would have low self esteem if they had the status and school abilities of blacks.

Another very important racial difference is in time preference. In a classic experiment children were asked to fill in a very simple questionnaire, and then offered a choice of rewards. They could have a small piece of candy now, or a bigger piece next week. Black children in Trinidad were found to prefer the immediate piece more than Indian (i.e. ancestors from India) children in Trinidad.⁶ Banfield⁷ has shown how many life decisions made differently by inhabitants of inner cities can be traced to differences in time preference. For instance, deciding not to study, or to steal a purse now, involves trading off immediate gratification for future gratification. Levin states that blacks watch 73 hours of TV per week versus whites' 50 hours, and spend twice as much per capita on movies in spite of lower incomes, which he implies is related to this trait. The fact that even at the same income level, blacks have typically accumulated less wealth than whites or Asians appears to be another reflection of this trait.

After an introduction to basic genetics, Levin presents the evidence (from twin and adoption studies typically) that within races, intelligence and personality traits show considerable variability. He starts out by quoting the Snyderman and Rothman⁸ study which showed three times as many experts thought the difference between blacks and whites in intelligence was both genetic and environmental as thought it was only environmental. Even among the editors and journalists surveyed, 27% were in the both genetic and environmental camp.

Levin then goes on to present some of the evidence that has persuaded so many experts that at least part of the differences between the race are genetic.⁹ He starts out by pointing out that racial differences in intelligence appear from about age three. Many of the cultural explanations (schooling for instance) have not had an effect before then. He recognizes the theoretical possibility that genetics are very important for within race differences (as is well documented), but that the causes for racial differences are wholly environmental.

With a wholly environmental theory it is implausible that the heritability of a specific tests would be correlated with the racial differences in that test. Yet it has been found that the mental tests that are most heritable are those that show the greatest black white differences. Environmental factors would normally be expected to be greater for vocabulary tests than for picture arranging, but the racial differences on vocabulary tests are less, even though one would expect vocabulary to be among the most culture sensitive of tests.

Professor Levin is a professional philosopher (City University of New York). His views on

philosophy are interesting, and to me at least, original. His approach is sociobiological and assumes that human nature evolved. Recognizing that moral feeling have probably evolved, he also recognizes the possibility that they may be different in different races. He feels that the white race has evolved to have a lower rate of time preference (i.e. gives higher weights to future events), and a greater degree of altruism and willingness to obey rules. He discusses the possibility that the hunting required for survival in prehistoric Europe required group cooperation, and that this led to greater altruism among its inhabitants. Gathering required less cooperation. At one point (p.176) he argues that "Since it is easier for female gatherers in a warm climate to support their offspring, there will be less intense selection for females who prefer fidelity in their mates, hence, by what Darwin called sexual selection, less intense selection for males disposed to conform to this female demand." This is part of Miller's (1994) differential paternal investment theory, which Levin had seen and discussed with the author, although it is not mentioned. Since Levin believes there is no logical basis for saying some beliefs or traits are better than others, he notes "Hunters may regard gatherer sexual morality as loose, while gatherers regard hunter sexual morality as inhibited."

One of the interesting ideas in the book is that the degree of altruism and the rates of time preference in a population should vary together. He goes through the evolutionary logic of cooperation, discussing the famous prisoner's dilemma game. He recognizes that in such situations non-cooperating (cheating) is optimal, if one will never see a person again. However, the environments humans evolved in were ones where people lived in small bands. They regularly saw the same people repeatedly. Cheating someone hurts in the long run, because that person will not cooperate with you next time you needed his help.

The last part of the book deals with questions of why race matters. Here again, Levin's role as philosopher comes in. He argues that whether the causes of black poverty and suffering is genetic is indeed important. If it is due to something that white people did, possibly the blacks have some claim for compensation (although the question would still have to be addressed of whether the whites now living were the ones who owed the compensation). However, Professor Levin argues that the black problems are due to genetic causes. Since no one is responsible for their own genes or for the genes of other people, this absolves the white community (and white individuals) of responsibility for black problems.

He uses the example of a man with an inherited limp in one leg. Out of politeness we may pretend not to notice his handicap. However, if he sues us claiming we caused his limp, it is a perfectly proper defense to present evidence that he was born with the problem. Levin ends his book with a discussion of crime, which deals both with the causes of racial differences in crime (after documenting that they do indeed exist), and with the provocative idea that perhaps it would be justified for citizens and for the police to take the known racial differences into account. Why Race Matters is the most politically incorrect academic book of recent years. However, in spite of this the reader will find many provocative facts and ideas in it.

Footnotes

1. See Pearson, R. (1997) *Race, Intelligence, and Bias in Academe*, Washington: Scott, Townsend, for an account of the pressures that Levin had to face.
2. Gould, S. (1981) *The Mismeasure of Man*, New York: Norton.
3. Gould, S. "Curveball". *The New Yorker*, Nov. 28, 139-149.
4. See Miller, E. (1994) *The Relevance of Group Membership for Personnel Selection: A Demonstration Using Bayes Theorem*, *Journal of Social, Political, and Economic Studies*, Vol. 19 (Fall 1994) No. 3, 323-359.
5. Jensen, A. R. (1980) *Bias in Mental Testing*, London: Methuen.
6. Mischael, W. (1961) "Father-absence and delay of gratification: cross-cultural comparisons." *Journal of Abnormal and Social Psychology* 63, 1, 116-124.
7. Banfield, E. (1974) *The Unheavenly City Revisted*. Boston: Little Brown.
8. Snyderman, M. and Rothman, S. (1988) *The IQ Controversy, the Media and Public Policy*. New Brunswick, Transaction Books.
9. For the Best and most up-to-date work on this, see Jensen, A. R. (1998) *The g Factor*. Westport: Praeger.

How Can We Encourage Bright Young Couples To Have More Children?

By Nathaniel Weyl

Originally published in The Eugenics Bulletin, Spring-Summer 1984

Our country annually spends billions of dollars to support the indolent and unemployable while they reproduce. Can it not do at least as much for healthy young couples of good character and above-average intelligence? The children of the latter group will usually enhance the productivity and progress of the nation, while those of the former will usually become burdens on society and a dead weight that the productive population must carry.

It is essential that our intelligent young men and women not defer child-bearing and child-raising until their years of greatest fecundity have passed. They should be encouraged to have children during those years when they are naturally best suited to do so, even though they may not be self-supporting at the time. The additional expenses of child-rearing weigh harder on youth and those beginning careers than on the middle-aged. It therefore becomes a social duty, both for the nation as a whole and its individual members, to assist bright and deserving couples to reproduce, and in that way improve the genetic quality of the American population. Affluent people past their own reproductive years are especially able to assist in this matter, but unfortunately they rarely do so.

The greatest impediment to progress in progressive eugenics (also called "positive eugenics") is the fact that we live in an egalitarian society. The notion that all men are equal in intelligence and abilities is a proposition in which no sensible person believes, yet one to which every prudent politician must pay lip service. Hence, schemes for financial aid to parents to enable them to produce large families are either indiscriminately applied or selectively applied to the most genetically impoverished elements of the population. Any plan to restrict public aid to those parents who have demonstrated that they are law-abiding and of at least average intelligence would be howled down as an affront to the democratic spirit and as class legislation to oppress the poor.

To maintain leadership in the modern world a nation should combine abundant fertility on the part of its intelligent and virtuous youth with higher educational facilities available to everyone with the requisite mental capacities.

For men and women of above-average intelligence, the coeducational colleges of the nation are today the most significant institutions for mate selection and family formation. They are admirably suited to fill this role because they are semi-closed communities in which young men and women live and study together during years of heightened sexual vigor, fecundity, and growing interest in forming stable emotional unions. Marriages of college students, during study or upon graduation, tend to bring together men and women more assortatively mated than the average for intelligence and with greater than average promise of producing superior-to-gifted children. Education and child rearing need not conflict. Parents should realize that discouraging children from marrying during their college years lowers the fertility of their families, for the number of children parents will ultimately have depends in large part on when they begin. Zero Population Growth (ZPG) had a disproportionately large influence on the campuses, thus contributing to the intellectual impoverishment of the American people. Fortunately, it appears largely to have died out.

Scholarships, stipends, fellowships, grants-in-aid, loans, subsidies have made it possible for most mentally qualified Americans to acquire a college education. Some 7 1/2 million Vietnam veterans, and millions of post-Vietnam veterans, have been potential beneficiaries of generous educational benefits. Partly because of the massive presence of veterans on campus, government and the universities and colleges have become more attuned to the problems of young married students with children, and have assisted them with loans, part-time employment, day-care centers, and subsidized housing. At the same time court orders and administrative decisions have forced formerly male and female colleges to become coeducational, thus widening the role of these institutions as communities of mate selection.

Under pressure from militant minority organizations and academic liberals and Marxists, the eugenic role of the colleges is diminished, however, when admissions and graduation standards are lowered. Furthermore, some universities, such as Columbia, Chicago, the University of Pennsylvania, the University of Southern California, Wayne State, and Temple have found themselves so swamped by slums that they seem to be small islands of order in oceans of vice and crime. Instead of moving to more healthy environments, these universities have generally committed themselves to the attempted "rehabilitation" of their neighborhoods, which has usually been unsuccessful.

One result is that such universities have largely ceased to be communities either for mate selection or other purposes, and have become places where students and faculty put in minimal time, sometimes at considerable personal risk. It also goes without saying that they are hardly good places to raise families.

What are the practical steps that could be taken to strengthen the role of the campus as an area of mate selection and family formation?

The fundamental step would be economic and would consist of the elevation of the economic

position of parents over that of the childless, i.e. financial and other aid to young couples on a scale sufficient to eliminate the economic incentive to remain sterile. This aid might include the following specifics: *Help in obtaining employment, both for students and non-student spouses

*Low-cost heavily-subsidized housing which provides a pleasant, healthy, and safe environment in which children can grow up

*Free day-care centers *Free provision of children's nurses and aides to the parents

*Special scholarships and fellowships

*Partial forgiveness on student loans for each child born, up to 100 %

*Relocation allowances for married students moving to attend the institution

*Fully-paid and adequate maternity leave from work at the university

*Low-cost and comprehensive health insurance for children of student parents

*Increases in university salaries for each child born

Such a program would not only have far-reaching eugenic benefits, but could also be in the immediate interest of institutions adopting it, since they would become more competitive in attracting top graduate students, many of whom are married. In this way their prestige would rise, which ultimately is translated into endowments, grants, research funds, and donations. Such a situation would also redound to the benefit of the towns and cities in which the institutions are located.

Aside from the universities themselves, the agency best equipped to plan and carry out much of this program is the Department of Education. Unfortunately, there is very little pressure on it to do anything of the sort, partly because in our highly-fractionated country, where pressure groups occupy the place where consensus once reigned, young parents are one of the few major groups which is not organized to lobby for its special interests. Yet these interests, unlike those of some other minorities, largely coincide with those of the nation as a whole.

In addition to programs and incentives, what is needed is a fundamental change in attitude, a recognition that to court biological extinction is immoral. A new ethic on the campus could inspire so many of the brightest to become parents that those childless by design would feel their self-imposed barrenness as a reproach and would be prompted to marry and reproduce in order to participate.

The New Enemies of Evolutionary Science

By J. Philippe Rushton

(Note: The following report by J. Philippe Rushton was originally published in *Liberty*, March, 1998, Vol. II, No. 4, pp. 31-35)

The decencies and pieties of the age are at war with the pursuit of truth.

On January 19, 1989, in the Sausalito Room of the San Francisco Hilton Hotel, my life changed forever. I stood before a lectern speaking to a symposium of scientists belonging to the American Association for the Advancement of Science (AAAS). The title of the brief paper I proceeded to present to the meeting was "Evolutionary Biology and Heritable Traits (With Reference to Oriental-White-Black Differences)."

I reviewed the international literature recently published in academic peer-reviewed journals. I summarized data about traits like brain size, temperament, speed of maturation, family structure, and reproductive variables. I tentatively concluded, roughly speaking, that East Asians, on average, were slower to mature, less fertile, less sexually active, with larger brains and higher IQ scores than Africans, who tended to the opposite in each of these areas. Whites, I found, fell between the other two groups.

I further contended that this orderly tri-level hierarchy of races in average tendency had its roots not only in economic, cultural, familial, and other environmental forces but also, to a far greater extent than mainstream social science would suggest, in ancient, gene-mediated evolutionary ones. Heredity, or nature - to use the term popularized by Francis Galton, Charles Darwin's younger cousin - was every bit as important as environment or nurture, often more so.

To account for the racial pattern in brain size and the other "life-history variables," I proposed a gene-based life-history theory familiar to evolutionary biologists as the r - K scale of reproductive strategy. At one end of this scale are r strategies, which emphasize high reproductive rates, and, at the other K -strategies, which emphasize high levels of parental investment. This scale is generally used to compare the life histories of widely disparate species but I used it to describe the immensely smaller variations within the human species. I hypothesized that Mongoloid people are, on average, more K -selected than Caucasoids, who in turn are more K -selected than Negroids.

I also mapped this theory onto human evolution. Molecular genetic evidence shows that modern humans evolved in Africa sometime after 200,000 years ago, with an African/non-African split occurring about 110,000 years ago, and a Mongoloid/Caucasoid split about 41,000 years ago. The farther north the populations migrated, "out of Africa," the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children successfully during prolonged winters. As these populations evolved into present-day Europeans and East Asians, they did so by shifting toward larger brains, slower rates of maturation, and lower levels of sex hormone with concomitant reductions in sexual potency and aggression and increases in family stability and longevity.

I did not claim to have established the truth of these hypotheses. They may never be established in their entirety. But if they, or any part of them, or even any parallel hypotheses were eventually confirmed, we would have an explanation of why the measured traits are statistically distributed among racial groups in the distinct patterns evident in the data I had examined. The theories provided testable hypotheses and consequently complied with two fundamental goals of any science: the search to provide causal explanations of phenomena, and the search to unify separate fields of thought. These powerful incentives pulled me forward.

I emphasized two caveats in my presentation before the AAAS. First, because there is enormous variability within each population and because the population distributions overlap, it is always problematic to generalize from a group average to any particular individual. Secondly, because genetic effects are necessarily mediated by neurohormonal and psychosocial mechanisms, many opportunities exist for intervention and the alleviation of suffering.

My hypothesis so stunned AAAS organizers that they quickly called a press conference to publicly dissociate themselves from my remarks. At the press conference, the president of the AAAS, Dr. Walter Massey, vice-president for research at the University of Chicago, told reporters that my credentials as a psychologist were good and that scholars participating in the conference were free to draw any conclusions they choose. Massey affirmed that the AAAS would never consider muzzling any scholar because the free expression of views was the essence of academic discussion. He went on to say that I had made "quite a leap of faith from the data to the conclusions" and that he found the paper "personally disturbing" and its conclusions "highly suspect." The scene was eerily reminiscent of the closing sequence of the film *Rosemary's Baby* with the media setting up to take pictures of the newborn devil, cloven hoofs and slit eyes, ready to raise hell on earth. I was about to become an academic pariah.

By the time I returned from the conference to my home in London, Ontario, and my job as professor of psychology at the University of Western Ontario, the uproar was in full swing. "Canadian Professor Provokes Uproar With Racial Theories," proclaimed Canada's national newspaper, the venerable *Globe and Mail*. "Theory Racist: Prof Has Scholars Boiling," declared the influential *Toronto Star*. "UWO Professor Denies Study Was Racist," trumpeted the local *London Free Press*.

Newspapers took my views to hostile social activist groups and got their predictably hostile opinion. They said I should be fired for promoting hatred. The press then took this idea to the president of the university who upheld the principle of academic freedom. The ongoing conflict was serialized for weeks. Student activist groups soon entered the fray, demanding that I meet with them in a public

forum.

TV coverage of my theories juxtaposed photos of me with footage of Nazi storm troops. Editing and voiceovers removed any mention of my qualification that the race differences I had identified were often quite small and could not be generalized to individuals and didn't mention that like any decent human being I abhor Nazi racial policies. Newspapers caricatured me as wearing a Ku Klux Klan hood or talking on the telephone to a delighted Adolf Hitler. The *Toronto Star* began a campaign to get me fired from my position, chastising my university and stating "This protection of a charlatan on grounds of academic freedom is preposterous." Later, the same paper linked me to the Holocaust saying, "[Thus] there emerged the perverted 'master race' psychology of the 20th century, and the horror of the Holocaust. Oddly, the discredited theories of eugenic racism still are heard, most recently from an academic at an Ontario university." I had no choice but to hire a prestigious law firm and issue notices under the Libel and Slander Act against the newspaper. This brought the media campaign against me to a halt.

Hate Crime Laws

In the U.S. there is a First Amendment to protect the right of every citizen to free speech and there is not much the government can do to silence unpopular ideas. In Canada and many Western European countries, however, there are laws against free speech, ostensibly enacted to inhibit "hate" and the spreading of "false news."

Two weeks after my AAAS presentation, the premier of Ontario denounced my theories. My work was "highly questionable and destructive" and "morally offensive to the way Ontario thinks," he said. It "destroys the kind of work we are trying to do, to bring together a society based on equality of opportunity." The premier told reporters he had telephoned the university president and found him in a dilemma about how to handle the case. The premier said that he understood and supported the concept of academic freedom, but in this particular case dismissal should occur "to send a signal" to society that such views are "highly offensive."

When the university failed to fire me, the premier asked the Ontario Provincial Police to investigate whether I had violated the federal Criminal Code of Canada, Chapter 46, Section 319, Paragraph 2, which specifies: "Everyone who, by communicating statements, other than private conversation, willfully promotes hatred against any identifiable group is guilty of an indictable offense and is liable to imprisonment for a term not exceeding two years."

The police questioned my colleagues and members of the administration and professors at other universities, demanded tapes of media interviews, and sent a questionnaire to my attorney to which I was obliged to reply in detail. (There's no Fifth Amendment in Canada either). After harassing me and dragging my name through the dirt for six months, the Attorney General of Ontario declined to prosecute me and dismissed my research as "loony, but not criminal."

This did not halt the legal action. Eighteen students, including seven Black students, lodged a formal complaint against me to the Ontario Human Rights Commission claiming that I had violated Sections, 1, 8, and 10 of the 1981 Ontario Human Rights Code guaranteeing equality of treatment to all citizens

of the province. In particular, I was charged with "infecting the learning environment with academic racism." As remedy, the complainants requested that my employment at the university be terminated and that an order be made requiring the university to "examine its curriculum so as to eliminate academic racism."

I was outraged. A more flagrant attack on the right to freedom of expression was difficult to imagine in a supposedly free country. "Human rights" tribunals were becoming a menace - a direct threat to the very human rights and fundamental freedoms they were supposed to protect. The Ontario Human Rights Commission could no more change the truth about human races than could the Christian Inquisition about the solar system or the KGB about the genetics of wheat. I found it difficult to accept the increasingly obvious fact that in the post-Soviet world, an academic was freer to say what he believed about some things in Russia, than in Canada.

Four long years after the complaint was lodged, the Ontario Human Rights Commission abandoned its case against me claiming it could no longer find the complainants to testify.

Events at the University

In its relations with the outside world the university administration stood firmly for academic freedom. The president gave a press conference to state categorically that there would be no investigation of me, that I would not be suspended, and that I was free to pursue any line of research I chose.

Behind the scenes, however, I became the target of a witch hunt by some of the administrators. Dismayingly, my dean, a physical anthropologist, publicly declared that I had lost my scientific credibility and spearheaded an attack on me in the newspapers. She issued a series of preemptive statements making plain her negative opinion of me and my work. "What evidence is there for this ranked ordering of the evolution of the human races?" she wrote. "None." Claiming that her views represented only her academic opinion she emphasized that she was not speaking in any administrative capacity. Her letter was nonetheless widely interpreted in the media as a refutation by my "boss." Henceforth, in order to support me, a person would now have to go up against the dean in addition to prevailing opinion. Next, the chair of my department gave me an annual performance rating of "unsatisfactory" citing my "insensitivity." This was a remarkable turnaround because it occurred for the same year in which I had been made a Fellow of the prestigious John Simon Guggenheim Foundation. My previous twelve years of annual ratings had been "good" or "excellent." Indeed, my earlier non-controversial work had made me one of the most cited scholars in my university.

Because unsatisfactory ratings can lead to dismissal, even for a tenured professor like me, I contested the rating through various levels of grievance, wasting an enormous amount of time and emotional energy. The proceedings that followed were Kafkaesque, terrifying when they weren't simply funny. For example, the grievance procedures required that I first appeal the Chairman's negative assessment to the Dean. The Dean had already spoken out against me, so I asked the Dean to recuse herself from hearing the case. She refused. So I had to appear before her.

At my hearing, the Dean's folded arms and glowers of fury made her decision obvious, and six weeks later, she upheld the Department Chair's decision. In a seven-page letter justifying her decision, she cast

aspersions at my "sensitivity," and my sense of "responsibility," and questioned whether there were, in fact, "any" papers that had ever been published that had supported my perspective other than those I had written myself.

I decided on a more drastic defense. I wrote to colleagues around the world and received over 50 strong letters of support, many endorsing the evidence I had presented. When the Dean found out about this she went absolutely ballistic, on one occasion screaming and spitting at me in fury.

I eventually won my appeal against the Dean and the Chair and two separate grievance committees chastised them for their actions against me. My annual performance ratings are back to receiving grades of "good" and "excellent."

Some radical and Black students mobilized and held rallies, even bringing in a member of the African National Congress to denounce me. In one demonstration, a mob of 40 people stormed through the psychology department, banging on walls and doors, bellowing slogans through bull horns, drawing swastikas on the walls, and writing on my door "Racist Pig Live Here."

The administration responded by barring me from the classroom and ordering me to lecture by videotape on the pretext that they could not protect me from the lawlessness of students. Again I launched formal grievances. After a term of enforced teaching by videotape, I won the right to resume teaching in person, though then I was required to run a gauntlet of demonstrators shouting protests and threats. Only after several forced cancellations of my classes did the administration warn the demonstrators that further action would lead to suspension and legal action. That brought the protests to a halt.

De Facto Censorship and the Corruption of Scholarship

As a graduate student at the London School of Economics and Political Science in 1973, I witnessed a physical assault on Hans Eysenck, who was studying the biological basis of intelligence and had recently published his book *Race, Intelligence, and Education* (1971). The slogan of that day was "Fascists Have No Right To Speak," and Eysenck became a target for attack. No legal charges were brought for the widely witnessed assault because another popular slogan of the 1960's, for those who approved the message but disapproved the tactic, was "There are no Enemies on the Left." Stories of harassment and intimidation could be told by many others who have had the temerity to research topics that touch on the genetic or distributional basis of race differences.

Today, many campus radicals from the 1960's are the tenured radicals of the 1990's. They have become the chairs of departments, the deans, and the chancellors of the universities: senior political administrators in Congress and Houses of Parliament, and even the presidents and prime ministers of countries. The 1960's mentality of peace, love, and above all, equality, now constitutes the intellectual dogma of the Western academic world. There are laws to prohibit platforms for those denounced as "fascists" and others deemed to be not politically correct.

In his book, *Kindly Inquisitors*, Jonathan Rauch showed that even in the U.S. with the First Amendment in place, many colleges and universities have set up "anti-harassment" rules prohibiting - and

establishing punishments for - "speech or other expression" that is intended to "insult or stigmatize an individual or a small number of individuals in the basis of their sex, race, color, hankicap, religion, sexual orientation or national and ethnic origin." (This is quoted from Stanford's policy, and is more or less typical.) One case at the University of Michigan became well known because it led a federal court to strike down the rule in question. A student claimed, in a classroom discussion, that he thought homosexuality was a disease treatable with therapy. He was formally disciplined by the university for violating the school's policy and victimizing people on the basis of sexual orientation.

In Canada and Western Europe, governments can and do prohibit speech on topics they consider obnoxious. In Denmark, a woman wrote a letter to a newspaper calling national domestic partner laws "ungodly" and homosexuality "the ugliest kind of adultery." She and the editor who published her letter were targeted for prosecution. In Great Britain, the Race Relations Act forbids speech that expresses racial hatred, "not only when it is likely to lead to violence, but generally, on the grounds that members of the minority races should be protected from racial insults." In some parts of the world you can be jailed, exiled, or even executed for expressing forbidden opinions.

Irrespective of religious background, or political affiliation, virtually all American intellectuals adhere to what has been called 'one-party science.' For example, only politically correct hypotheses centering on cultural disadvantage are postulated to explain the differential representation of minorities in science. Analyses of aptitude test scores and behavioral genetics are taboo. Cheap moralizing is so fierce that most people respect the taboo. This intellectual cowardice only encourages vicious attacks by activist groups on those who are engaged in legitimate scientific research showing that there is a genetic basis underlying individual and group differences.

The high-placed pervasiveness of the egalitarian orthodoxy is scary. Even more frightening than what happened to me is the experience of Christopher Brand, professor of psychology at Edinburgh University. On February 29, 1996, Brand's book on intelligence, *The g Factor*, was published in the United Kingdom by the British subsidiary of John Wiley & Sons, Ltd. On April 14, newspaper reports of interviews with him began to appear saying that he thought black people had a lower IQ than did whites and that these were probably partly genetic. On April 17, Wiley's company in New York denounced Brand's views as "repellent" and withdrew the book from bookstores. A blizzard of "refutations" of Brand appeared in the U.K. media under outraged headlines. Protests from members of Parliament, student boycotts of his lectures, and calls for his resignation by faculty at the University of Edinburgh all predictably ensued. Brand's refusal to be silenced and his defense of free speech led him to be fired (on August 8, 1997) for bringing his university into disrepute. There but for the grace God, go I.

In 1995, my monograph *Race, Evolution, and Behavior* was published by Transaction Publishers. Subsequently, the book was translated into Japanese (1996) and released as a softcover edition (1997) with an Afterword updating the science since the hardback went to press.

The book garnered a lead review in the *New York Times Book Review* (October 16, 1994) where Malcolm Browne, the *Times* science writer, discussed it along with Richard Herrnstein and Charles Murray's *The Bell Curve* and Seymour Itzkoff's *The Decline of Intelligence in America*. Browne concluded his analysis with the statement that "the government or society that persists in sweeping this

topic under the rug will do so at its peril." Dozens of other journals, including the *National Review*, *Nature*, and *The Nation*, also reviewed it.

Its publication by an important academic press touched off a new round of hysteria. A lurid article screaming "Professors of HATE" (in five-inch letters!) appeared in *Rolling Stone* magazine (October 20, 1994). Taking up the entire next page was a photograph of my face, hideously darkened, twisted into a ghoulish image, and superimposed on a Gothic university tower. In another long propaganda piece entitled "The Mentality Bunker" which appeared in *Gentleman's Quarterly* (November 1994), I was misrepresented as an outmoded eugenicist and pseudoscientific racist. A photograph of me was published in brown tint reminiscent of vintage photos from the Hitler era.

Incredibly, Canada Customs seized and withheld copies of one shipment of the book for nine months while they tried to decide whether to condemn the book as "hate literature" and ban it from entering Canada. The fact that an academic book was even the subject of an investigation stunned my publisher: "I've never heard of such a thing," said Mary Curtis, Chairman of the Board of Transaction. "This is not supposed to happen in Canada. The last time the company had trouble shipping scholarly works was in the mid-1980's, when some books shipped to the Moscow Fair didn't make it."

Michel Cl  roux, a spokesman for Canada Customs, said Customs were just following orders by investigating possible hate propaganda. A departmental policy prohibiting hate propaganda includes this definition: "Goods alleging that an identifiable group is racially inferior and/or weakens other segments of society to the detriment of society as a whole." After an "investigation" lasting nine months, Canada Customs relented.

Harassment continued at another meeting of the American Association for the Advancement of Science. The AAAS routinely allows the militantly disruptive International Committee Against Racism (INCAR) and Progressive Labor Party (PLP) to have official "Exhibitor" status, along with a booth, at its annual meeting. At the February 1996 meeting in Baltimore, INCAR and PLP festooned their booth with posters of Karl Marx and signs taking credit for interfering with the University of Maryland conference on "Genes and Crime" in September 1995.

At the AAAS meeting, INCAR targeted my poster presenting a review of the literature on brain size and cognitive ability. When INCAR encountered me the day before the poster presentation, they yelled so many death threats that the AAAS called the Baltimore police, who dispatched an armed officer to stand by the presentation. Despite the guard, INCAR continued to utter threats. One demonstrator took photographs of me saying they were for a "Wanted: Dead or Alive" poster. "You won't be living much longer," he said. Incredibly, instead of cancelling the Exhibitor Status of organizations that threaten violence, the program director of the AAAS's annual meeting said, in an interview published in *The Scientist* (March 4, 1996), that AAAS would tighten up the screening process to make it more difficult for presentations like mine to get on the program!

As Charles Murray has observed in the aftermath to *The Bell Curve*, social science is corrupt on the topic of race. Yet, the genetic hypothesis for the pervasiveness of the three-way racial pattern across so many traits, and which calls into question simple explanations based only on social factors like discrimination and poverty, needs to be discussed.

In his commencement address to the graduating class of 1997 at the University of California (San Diego), U.S. President Bill Clinton called for a new dialogue on race and for "deepening our understanding of human nature and human differences." But apparently there are some aspects of human nature and human differences he'd rather leave unexplored.

I've learned a great deal since that day in 1989 when I stood before that meeting of scientists and presented a summary of my research, thereby making myself the target of harassment by the politically correct and the object of intimidation by the government of Canada. Despite the vicious campaign against investigation of the possible genetic basis of group differences, my interest never wavered. Work on other topics seemed shallow by comparison. Spurred by attacks and aided by colleagues, I have sought out more definitive tests of the genetic hypothesis and continue to publish my research.

I've also learned how important freedom of inquiry is to science, which must always remain to pursue truth without regard for where that pursuit leads. I've learned to treasure such remnants of freedom of speech as I enjoy as a citizen of Canada, and remain more committed than ever to the search for truth. As Benjamin Franklin observed more than two centuries ago, "Without freedom of thought, there can be no such thing as wisdom, and no such thing as public liberty, without freedom of speech."

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The Mismeasures of Gould

By J. Philippe Rushton

(Originally published in *The National Review*, September 15, 1997)

Mr. Rushton is professor of psychology at the University of Western Ontario in London. This article is adapted from his review in the referred academic journal *Personality and Individual Differences*, Vol. 23, pp. 169-180. [The complete article can be found here.](#)

``[Steven Jay] Gould occupies a rather curious position, particularly on his side of the Atlantic. Because of the excellence of his essays, he has come to be seen by non-biologists as the pre-eminent evolutionary theorist. In contrast, the evolutionary biologists with whom I have discussed his work tend to see him as a man whose ideas are so confused as to be hardly worth bothering with, but as one who should not be publicly criticized because he is at least on our side against the creationists."

YEP, that's the Steven Jay Gould -- Harvard paleontologist, best-selling science popularizer, *Natural History* magazine columnist, and media superstar -- in the opinion of John Maynard Smith, one of the founders of modern evolutionary theory. Smith's skepticism about Gould is pervasive among his peers. Daniel Dennett's brilliant 1995 book, *Darwin's Dangerous Idea*, was largely devoted to dispelling Gouldian misinformation. John Alcock, author of standard animal-behavior textbooks, recently described Gould as ``consistently employing the same limited set of debating techniques and stylistic devices . . . while simply ignoring evidence to the contrary."

This civil war among evolutionists has now burst into the open. Gould struck back, with his trademark deceptive elegance, in *The New York Review of Books* (June 12, June 26, August 14), house organ of the New York intelligentsia that has long been his real constituency.

The point at issue between the evolutionists and Gould seems arcane. Does evolution proceed gradually or through ``punctuated equilibrium" -- immobility interrupted by transforming upheaval? Gould's preference for the latter reflects his left-wing politics -- for evolutionary upheavals, read social revolutions. Yet it may also be traced to his refusal to admit that systematic differences, probably evolutionary in origin, exist among human beings.

That same refusal regularly distorts Gould's 1981 *The Mismeasure of Man*, now reissued in a ``revised and expanded" edition (Norton, \$13.95). *The Mismeasure of Man* (which in its first version sold 250,000 copies, was translated into ten languages, and became required reading for undergraduate and even graduate classes) dealt with questions that are delicate, controversial, and (to the scientific layman) even discomfiting: IQ, brain size, sex, and race. It did so by

unscrupulously mishandling the evidence. The new version -- described by the publisher as "an acclaimed classic that refutes the conclusions of *The Bell Curve*" -- is expanded but hardly revised. It regurgitates character assassinations of deceased scientists, misrepresents their work despite published refutation, and studiously withholds 15 years of new research that contradicts every major scientific argument Gould puts forth.

Perhaps the single most devastating development for Gould: new research on brain size. Was he asleep throughout the 1990s -- called, with good reason, "The Decade of the Brain"?

Gould originally charged nineteenth-century scientists with "juggling" and "finagling" brain-size data in order to place Northern Europeans at the apex of civilization. Implausibly, he argued that Paul Broca, Francis Galton, and Samuel George Morton, all "finagled" in the same direction and by similar magnitudes using different methods. Gould asks us to believe that Broca "leaned" on his autopsy scales when measuring wet brains by just enough to produce the same differences that Morton caused by "over-packing" empty skulls and that Galton caused with his "extra loose" grip on calipers while measuring heads! Yet even before *Mismeasure's* first edition, new research was confirming the work of nineteenth-century pioneers. Gould neglected to mention that Leigh Van Valen had already established a positive correlation between brain size and intelligence in 1974.

Subsequently, of course, discoveries using Magnetic Resonance Imaging (MRI), which creates a three-dimensional image of the living brain, have shown a strong positive correlation (0.44) between brain size and intelligence. And there is more. The National Collaborative Perinatal Study, as reported by Sarah Broman and her colleagues, showed that head perimeter measured at birth significantly predicts head perimeter at 7 years -- and head perimeter at both ages predicts IQ. Recent studies also show that head size and IQ vary with social class. It is now clear that the nineteenth-century pioneers were right.

The first of the MRI studies were published in the late 1980s/early 1990s in leading, mainstream refereed journals like *Intelligence* and the *American Journal of Psychiatry*. My colleagues and I routinely sent Gould copies and asked him what he thought. He never replied. Now he has chosen to withhold all these data from his readers.

Indeed, in the 1996 edition he deletes the very section of his own 1981 book that discussed the brain-size/IQ relation. In 1981, he had pooh-poohed Arthur Jensen's report (in *Bias in Mental Testing*) of a 0.30 correlation between brain-size and IQ -- but he omits this dismissal, without explanation, from the revised version. I can only infer that when Gould read Jensen's review of his book (which he mentions), he realized that Jensen's correlation was based on Van Valen's 1974 review and so could no longer be dismissed as "just Jensen." And, given the weight of the new evidence, simply repeating this section verbatim would have destroyed his entire thesis. He therefore left it out.

Is it reasonable, however, to expect brain size and cognitive ability to be related? Yes. H. Haug in 1987 found a correlation of 0.479 between the number of cortical neurons and brain size in humans. Gould dismisses differences in brain size as "trivial." But a difference of one cubic inch in brain size translates into a very nontrivial millions of cortical neurons and hundreds of millions of synapses -- a significant difference in mental activity and potential.

It is, of course, relationships between brain size/IQ and sex and race which, understandably, arouse the most anxiety. Some critics have even suggested a social taboo on discussion and research in these fields. That would run counter to the entire tradition of scientific inquiry. Be that as it may, it is surely indisputable that if such research is to be conducted, it must be done accurately and scrupulously. And here Gould fails again.

An absolute difference in brain size between men and women has not been disputed since at least the time of Broca (1861). Gould, however, claims that the sex difference disappears when appropriate statistical corrections are made for body size or age of people sampled. But when he used multiple regression to remove the simultaneous influence of height and age, he succeeded in reducing the sex difference by only one-third. He then invoked additional unspecified age and body parameters, claiming that if these could be controlled the entire difference would disappear.

David Ankney in 1992 questioned Gould's methodology. He re-examined autopsy data on 1,261 American adults and found that at any given body surface area or height, men's brains are heavier than women's. His research -- since confirmed by my own 1992 survey of 6,325 U.S. Army personnel -- attributes only about 30 per cent of the sex difference in brain size to differences in body size.

Admittedly, the brain-size studies present a paradox. Women have proportionately smaller brains than men but, apparently, the same intelligence scores. Ankney suggests that the difference in brain size may relate to those intellectual abilities at which men excel -- namely, spatial and mathematical ability -- which may require more "brain power" than do verbal abilities. Other theories are that men average slightly higher in general intelligence than do women, and finally that these particular differences in brain size have nothing to do with cognitive ability at all, but reflect greater male muscle mass and physical coordination in tasks like throwing and catching.

Similarly, Gould denies that brain weight varies with race. He repeats verbatim his 1981 claim that Samuel George Morton -- a giant of nineteenth-century American science -- "unconsciously" doctored his results on cranial capacity to prove Caucasian racial superiority. Yet he must know that John S. Michael reported in *Current Anthropology* in 1988 that he had checked Morton's work and found very few errors -- and these not in the direction that Gould asserted. Instead, Michael found errors in Gould's work.

In my own published work, uncited by Gould, I have shown that brain sizes vary systematically by race -- but not to the benefit of Caucasians. For what it is worth, Mongoloids average about a cubic inch more than Caucasoids and over three cubic inches more than Negroids. This result has been corroborated many times since 1980, and by every available technique. And these findings are in line with the (by now) accepted IQ results: the average IQ scores for "African," "Latino," "White," "Asian," and "Jewish" Americans are 85, 89, 103, 106, and 115, respectively. Of course, whether these differences are the result of genetic or environmental influences, and whether (or to what extent) they are remediable by purposeful action -- these remain matters of dispute.

GOULD'S faults extend well beyond sins of omission to include sins of commission. His "new" edition repeats the same false accusations about individuals that have been thoroughly refuted since 1981. Thus, Gould leaves unmodified his denigration of Sir Francis Galton as "a dotty Victorian eccentric." This was rightly described by Cambridge statistician A. W. F. Edwards in the *London Review of Books* (1983), as "a thoroughly tendentious portrait." Edwards pointed out that Gould, in a book full of references to correlation, multiple regression, principal-components analysis, and factor analysis, totally failed to inform his students that this whole statistical methodology was pioneered by Galton -- and to measure human intelligence.

He also repeats his trashing of Sir Cyril Burt, the eminent British educational psychologist, who reported a heritability for IQ of 77 per cent for identical twins reared apart. After his death in 1971, Burt was widely accused of fabricating his data. However, five separate studies of identical twins raised apart have now corroborated his findings. Two meticulously researched books, by Robert B. Joynson and Ronald Fletcher, have vindicated Burt, describing how he was railroaded by anti-hereditarian zealots. Gould ignores them.

Gould's most inflammatory allegation is to blame IQ testers for increasing the toll of the Holocaust. His thesis is that early IQ testers claimed Jews as a group scored low on their tests. This finding was then allegedly used to support passage of the restrictive Immigration Act of 1924, under which Jewish refugees were denied entry in the 1930s. Gould even claims that Henry H. Goddard in 1917 and Carl C. Brigham in 1923 labeled four-fifths of Jewish immigrants as "feeble-minded . . . morons."

In both cases, this has repeatedly been shown to be untrue. For example, Goddard was testing to see if the standard Binet test identified what were then called "high-grade defectives" as well among immigrants as it did among native-born Americans. (It did.) He explicitly did not assert that 80 per cent of Russians, Jews, or any immigrant group in general were feeble-minded.

Gould repeats his account despite widely disseminated refutations. Historian of psychology Franz Samelson began setting the record straight in the journal *Social Forces* as early as 1975. Mark Snyderman and the late Richard Herrnstein, writing in *The American Psychologist* in 1983, corroborated Samelson's conclusions and showed that the testing community in general

did not view its findings as favoring immigration restriction, and that Congress took virtually no notice of intelligence testing in framing the legislation.

The eminent historian Carl N. Degler, in his 1991 book *In Search of Human Nature*, took Gould to task for ignoring contradictory information. He points out, for example, that the high scores of Orientals did not prevent them from being excluded from immigrating -- and that their scores would have embarrassed any attempt to make IQ the basis of immigration policy. Daniel Seligman debunked Gould's anti-testing propaganda in his book *A Question of Intelligence*. Herrnstein and Charles Murray, in their book, *The Bell Curve*, also highlighted the issue in a special boxed section. Gould reviewed *The Bell Curve* (twice!). Yet he ignores all these counter-arguments in his "revision."

Indeed, in his account of *The Bell Curve*, Gould charges Herrnstein and Murray with "disingenuousness." He then withholds from readers the fact that their book was principally an empirical analysis of social stratification drawn from the 12-year National Longitudinal Survey of Youth. Most high-IQ 17-year-olds, blacks as well as whites, went on to occupational success in their late twenties and early thirties. Many of those with low IQs, both black and white, went on to welfare dependency. Thus IQ tests are predictive.

Gould's attack on *The Bell Curve* focuses on its use of the "general factor of intelligence," or *g*, which psychometricians hypothesize underlies tests of mental ability. Gould likes to leave his readers chanting the mantra, "g is nothing more than an artifact of the mathematical procedure used to calculate it." But every major study shows that different IQ tests tend to be significantly intercorrelated, suggesting an underlying commonality. Thus Nathan Brody, Arthur Jensen, and John Carroll have all provided detailed empirical and analytical demonstrations of the reality of *g* (including, incidentally, a strong correlation with brain size). Gould ignores them all.

Gould employs another technical trick as well as attacking *g*: he continues to argue that findings about IQ differences within groups cannot be applied to differences between groups. (Curiously, he does not object when environmentalists use nutrition as an explanation of both within-group and between-group differences.) Research has found that racial differences are more pronounced on subtests that are highly heritable than on less heritable tests. This clearly supports the genetic hypothesis. Gould ignores it.

And most transracial adoption studies provide evidence for the heritability of racial differences in IQ. For instance, Korean and Vietnamese children adopted into white American and white Belgian homes were examined by E. A. Clark and J. Hanisee, by M. Frydman and R. Lynn, and by M. Winck et al. Many had been hospitalized for malnutrition. But they went on to develop IQs ten or more points higher than their adoptive national norms.

Gould does refer to adoption studies -- but only to a German finding of "no difference" between pre-puberty mixed-race children fathered by black soldiers and those fathered by white soldiers.

He also mentions a similar result in Minnesota which seems to refer to an early report of the famous Minnesota Transracial Adoption Study. That study has subsequently found, however, that marked black/white differences emerged by age 17. (Environmental influences typically wash out by adolescence.)

FINALLY, Gould continues to ridicule the "ape in some of us" hypothesis proposed by Cesare Lombroso (1836 - 1909), the founder of criminology. Lombroso argued that many criminals were throwbacks to man's ancestral past, and that "natural-born criminals" could be identified by anatomical signs of primitiveness. (Contrary to Gould, however, Lombroso also believed that criminal behavior could arise in "normal" men.)

The reader of *Mismeasure* will search in vain, however, for even a dismissive reference to recent evidence that criminal behavior does indeed have a biological basis. Adrian Raine has reviewed several studies using MRI, Computerized Tomography, and Positron Emission Tomography to inspect the brains of violent and sexual offenders. He tentatively concluded that frontal-lobe dysfunction was associated with violent behavior, including rape. Further, it has been long established that criminals tend to have lower IQs than non-criminals. So, given the relation between brain size and IQ, Lombroso's finding of a smaller brain in criminals is probably correct.

Nor does Gould feel compelled to let his readers know that Lombroso's ideas have now received considerable support from behavioral genetics. Studies reported by Raine, David Rowe, and myself show that criminality is substantially more likely to be shared by identical twins than by fraternal twins. This clearly suggests a genetic factor, since both sets of twins share environments, but only identical twins have identical genes. Similarly, American, Danish, and Swedish studies of children adopted in infancy show that adopted children were more likely to be criminals if their biological parents -- rather than their adoptive parents -- were also criminals.

Even Lombroso's theory of bodily markers is not as far out as Gould would have you believe. It is now understood that drugs in pregnancy or other "insults" to the fetus may disturb its brain development and simultaneously produce a minor physical anomaly (MPA). For example, fetal ears start low on the neck and gradually drift upward. An insult to development can stop this and result in low-set ears -- an observable MPA. Thus, the number of MPAs is a rough index of (perhaps hidden) central-nervous-system anomalies.

For children raised in unstable families, Raine found that the number of MPAs at age 12 was related to violent behaviors at age 21. More generally, Raine even found that antisocial children often had more facial deformities, as judged by expert plastic surgeons.

In suppressing the hypothesis that genetics matter in crime by sneering at the long-dead Lombroso and ignoring the latest research, Gould is actively obstructing scientists from finding

ways to spare both future victims and delinquents -- who, in their own fashion, are also victims. It is thus Gould who is -- in Lombroso's words -- the delinquent man.

Gould tells us that he originally considered titling his book *Great Is Our Sin*, from Charles Darwin's remark: "If the misery of the poor be caused not by the laws of nature, but by our institutions, great is our sin." He avers that the scientific study of human differences in mental ability is nothing but an apology for elitist European enslavement and oppression of the rest of the world. This has become the apostle's creed of the adversary culture. However, even the most deeply held views cannot justify withholding evidence, engaging in character assassination, and repeating unfounded charges despite refutations.

"May I end up next to Judas Iscariot, Brutus, and Cassius in the devil's mouth at the center of hell if I ever fail to present my most honest assessment and best judgment of evidence for empirical truth," swears Gould on page 39 of his new introduction. By his own standard, Gould has consigned himself to the innermost circle of hell. But science, fortunately, is neither religion nor politics. Gould can save himself by owning up to the facts and ending his career of relentless special pleading.

(From the pages of National Review)



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More on the Bell Curve

By Charles Murray and Daniel Seligman

(Originally published in *The National Review*, December 8, 1997)

Is *The Bell Curve* the stealth public-policy book of the 1990s?

Mr. Seligman is the author of *A Question of Intelligence: The IQ Debate in America*. Mr. Murray is co-author of *The Bell Curve*.

DS: Three years after publication of *The Bell Curve*, I find myself endlessly reading news stories about great national controversies in which all the participants do their best to ignore the data you and Dick Herrnstein laid on the table. Three recent examples:

1) the row over school vouchers, whose advocates (e.g., Bill Bennett in the *Wall Street Journal*) endlessly take it for granted that poor performance by students reflects only inadequacies by the teaching profession -- inadequacies among the learners being a huge unmentionable;

2) the President's astounding proposal (never characterized as such) that all American youngsters, including those with IQs at the left tail, should have at least two years of college;

3) the expressions of surprise and rage when it turned out that, in the absence of affirmative action, prestigious law schools would be admitting hardly any black students. The participants in these controversies were in no sense talking back to *The Bell Curve*. They were pretending its data do not exist. What's your perspective?

CM: I read the same stories you do and ask the same question: Do these guys know but pretend not to? Or are they still truly oblivious? In the case of education vouchers, there is a sensible reason to ignore *The Bell Curve*: inner-city schools are overwhelmingly lousy. Bill Bennett has read the book, understands it, and (rare indeed) has defended it on national television. But his battle cry is, and should be, "These kids are getting a raw deal" -- not a lot of qualifications about the difficulties in raising IQ.

Bill Clinton and his pandering on college education is another story altogether. Vouchers for elementary school can be a good policy idea, no matter what our book says about IQ. But universal college education cannot be. Most people are not smart enough to profit from an authentic college education. But who among Republicans has had the courage to call Clinton on this one? A lot of silence about *The Bell Curve* can be put down to political cowardice.

Affirmative action was still politically sacrosanct when *The Bell Curve* came out in October 1994. Within a year, the tide had swung decisively. Did the book play any role? Damned if I know. Dick and I were the first to publish a comprehensive account of the huge gaps in SAT scores at elite colleges, but I have found not a single citation of the book during the affirmative-action debate.

My best guess -- and the broad answer to your question -- is that *The Bell Curve* is the stealth public-policy book of the 1990s. It has created a subtext on a range of issues. Everybody knows what the subtext is. Nobody says it out loud.

DS: I am reading with fascination your "afterword" in the paperback edition, and I have an argumentative question about the passage where you speculate on long-term responses to the book. You postulate a three-stage process. In stage one, the book and its authors take endless rounds of invective from critics who simply want to suppress the message that human beings differ in mental ability. These critics turn to thought control because they look at your findings and conclude, in Michael Novak's words, that "they destroy hope" -- a hope which Novak sees as a this-worldly eschatological phenomenon. [eschatological = relating to the end of the world. MVC] In stage two, the invective attracts the interest of scholars not previously involved in these disputes. They look over the empirical record, deciding in the end that your case is supportable and may indeed have been understated in some areas. In stage three, these scholars build on your work, and in the end do more than *The Bell Curve* itself to demolish those eschatological hopes. In the long run, the thought control shoots itself in the foot.

This process seems entirely plausible. But I wonder: Will the truth ever break out of the academic world? Remember, the basic message (including even a genetic factor in the black - white gap) was already pretty well accepted by scholars in the mid Eighties as the Snyderman - Rothman book documented. What I never see is acceptance of any part of this message in the public-policy world, where the term "IQ" is seldom uttered without the speaker's sensing a need to dissociate himself from it.

Among many horror stories is the current row over Lino Graglia, the University of Texas law professor now in trouble for having stated an obvious truth: that black and Mexican-American students are "not academically competitive" with white students. Graglia gave the most benign possible explanation for this educational gap: minority students were not genetically or intellectually inferior but were suffering from a cultural background in which scholarship was not exalted. But that explanation got him nowhere. He has been attacked by every editorial page in *Nexis* that has weighed in on the matter. (He did better in the letters columns.)

NOW, I can see the process you envision going forward -- with some scholars and maybe even some journalists looking at actual academic performance at Texas and other universities. What I cannot imagine is defenders of Graglia surfacing in any institutional setting -- at least not in the realms of politics and education, nor in major media. Meanwhile, what with Texas campus

demonstrations and Jesse Jackson's call for Graglia to be made a social pariah (cheered at the demonstrations), scholars have got the crucial message: Stay under cover if you hold beliefs challenging to those eschatological hopes.

CM: Graglia said ``culture." What everybody heard was ``genes." As soon as anyone argues that racial differences in intelligence are authentic, not an artifact of biased tests, everyone decodes that as saying the differences are grounded in genes. It is a non-sequitur, but an invariable one in my experience. America's intellectual elites are hysterical about the possibility of black - white genetic differences in IQ.

As you know, The Bell Curve actually took a mild, agnostic stand on the subject. Dick Herrnstein and I said that nobody yet knows what the mix between environmental and genetic causes might be, and it makes no practical difference anyway. The only policy implication of the black - white difference, whatever its sources, is that the U.S. should return forthwith to its old ideal of treating people as individuals.

But how many people know this? No one who hasn't read the book. Everyone went nuts about genes, so much so that most people now believe that race and genes is the main topic of our book.

Why? The topic of race and genes is like the topic of sex in Victorian England. The intellectual elites are horrified if anyone talks about it, but behind the scenes they are fascinated. I will say it more baldly than Dick and I did in the book: In their heart of hearts, intellectual elites, especially liberal ones, have two nasty secrets regarding IQ. First, they really believe that IQ is the be-all and end-all of human excellence and that someone with a low IQ is inferior. Second, they are already sure that the black - white IQ difference is predominantly genetic and that this is a calamity -- such a calamity indeed that it must not be spoken about, even to oneself. To raise these issues holds a mirror up to the elites' most desperately denied inner thoughts. The result is the kind of reaction we saw to Lino Graglia.

But when people say one thing and believe another, as intellectual elites have been doing about race, sooner or later the cognitive dissonance must be resolved. It usually happens with a bang. When the wall of denial gives way, not only will the received wisdom on race and IQ change, the change will happen very rapidly and probably go much too far. The fervor of the newly converted is going to be a problem. I fully expect, if I live another twenty years, to be in a situation where I am standing on the ramparts shouting: ``Genetic differences weren't a big deal when we wrote The Bell Curve and they still aren't a big deal."

DS: Watching Clinton perform in Little Rock the other day, and picking up especially on his lament about the extent and persistence of discrimination (including employment discrimination) in American life, I went back for one more look at that table on page 324 of The Bell Curve -- the one showing that job discrimination is essentially nonexistent in the United

States today. At least it is nonexistent among the younger workers in that huge sample from the National Longitudinal Survey of Youth.

Your argument begins by noting that when you control for age, education, and socioeconomic status (SES), black earnings are still only 84 per cent of white earnings, which implies continuing discrimination. As the table shows, however, when you bring IQ into the picture, everything changes. Even if you forget about education and SES and control only for age and IQ, the black - white earnings gap essentially disappears. To be precise: when you average the results for many different occupational categories, blacks of similar age and IQ make 98 per cent as much as whites. When you control for gender as well, the figure goes to 101 per cent.

These findings seem stunning to me, on several counts. First, they show that employers are astonishingly good at seeing through the imperfect credentials represented by educational levels and family background, and at figuring out which job prospects have the most ability. Second, the findings are surely big news -- and good news. They imply that much, or most, or essentially all (depending on the extent to which NLSY data can be generalized to the labor force as a whole) of what is routinely identified as invidious discrimination is nothing of the sort. It is rational behavior by employers and it shows them to be amazingly color-blind. So why is this news not on the front pages?

CM: Think about how that front-page story would have to be headlined. It would have to convey the thought, **BLACKS WITH EQUAL IQS GET EQUAL PAY**. You see the problem. No matter how reasonable the explanation, it is not intellectually permissible at this moment in history for blacks or women to have different outcomes from white males. If you really want egregious examples of that attitude, don't bother with IQ and blacks. Look at the military performance of women. A military officer came into my office some months ago, almost with tears in his eyes. "We're killing people," he said, referring to the degradation of entrance requirements and training standards for combat pilots -- a degradation carried out so that enough women could get through. How many journalists in major U.S. papers have been willing to write that story straightforwardly? When the problem of female combat performance is mentioned at all, it is with an "on the one hand, on the other hand" presentation, even though one side has all the data and the other side is only an attitude.

DS: Let me ask you to weigh in more heavily on an issue we touched on earlier -- the "average child" fallacy. This is the notion that any normal child can learn anything if only he gets the right teaching. Your data make plain that this view is nonsense. Indeed, you add: "Critics of American education must come to terms with the reality that in a universal education system many students will not reach the level of education that most people view as basic."

That thought was so important that you put it in italics. In our current debate on national standards and educational reform, however, no one is paying attention to it -- certainly not Bill Clinton, but also not many conservatives. I recently caught Jeanne Allen of the pro-voucher

Center for Educational Reform in a debate on CNN. She was complaining about education bureaucrats ``that don't believe, or don't necessarily think, all children are capable of learning to the highest level. I think that's scary."

Isn't it about time to scold conservative fans of education reform for persistently dodging reality when they're out there selling vouchers?

CM: I propose a new term: ``suspension of belief," defined as ``basing a public-policy stance on an assumption about human beings that one knows to be untrue of oneself." Do you suppose Jeanne Allen believes herself capable of learning to the highest level if we're talking, say, about quantum mechanics? Of course not. Only a few silly people who have never tested themselves are under the illusion that they have no educational limits.

Putting that last sentence on the screen, however, makes me pause. Many bright liberal-arts graduates have not tested themselves. In the liberal arts and some of the soft sciences it is possible to get a PhD without having to confront that awful moment: ``My God, studying hard won't be enough. It is beyond the power of my intellect to understand this." With me, it came halfway through a graduate course on the theory of matrices, and it was an invaluable lesson. Isaac Asimov once gave a rule of thumb for knowing when you've hit the wall: when you hear yourself saying to the professor, ``I think I understand."

Another factor may also be operating here: the isolation of the cognitive elite. If you have never had a close acquaintance with an IQ below 100, then you have no idea what ``dumb" really means.

Should we scold our conservative allies for this kind of naïveté? Chide, I guess. But I am uncomfortably aware of a sentence in a well-known conservative tome that reads, ``I suggest that when we give such parents [who are actively engaged in their child's education] vouchers, we will observe substantial convergence of black and white test scores in a single generation." The book is *Losing Ground*, page 224. So I have a first-stone problem here.

DS: One last question: Have you had second thoughts about formulations in *The Bell Curve*?

CM: If Dick and I were writing it again, I suppose we would go over the section on race and put in a few more italics, and otherwise try to grab readers by the shoulders and shake them out of their hysteria. But it probably wouldn't do any good. We would certainly incorporate an analysis of siblings into the chapters of Part II that deal with IQ and social problems -- the kind of analysis I did in that Public Interest article you mentioned earlier. And there's a highly technical error we made that had the effect of understating the statistical power of our results; I would like to fix that. But that's about all. The book's main themes will endure just fine.

The reality of a cognitive elite is becoming so obvious that I wonder if even critics of the book really doubt it. The relationship of low IQ to the underclass? Ditto. Welfare reform is helping the argument along, by the way, as journalistic accounts reveal how many welfare mothers are not just uneducated, but of conspicuously low intelligence. The intractability of IQ? Dick and I said that IQ was 40 to 80 per cent heritable. The identical-twin studies continue to suggest that the ultimate figure will turn out to be in the upper half of that range. More importantly, the literature on "nonshared environment" has developed dramatically since Dick and I were researching *The Bell Curve*. Its core finding is that, whatever the role of environment may be in determining IQ, only a small portion of that role consists of influences that can be manipulated (through better child-rearing, better schools, etc.). For practical purposes, the ability of public policy to affect IQ is probably smaller than Dick and I concluded.

With regard to race differences, nothing has happened to change our conclusions about the cultural fairness of the tests, the equal predictive validity of the tests, or the persistence of the 15-point gap. Recent data from the NLSY indicate that in the next generation not only is the black - white gap failing to shrink, but it may be growing.

So I do not expect any major finding in *The Bell Curve* to be overturned. I realize that attacking the book has become a cottage industry. The *New York Times* recently used one such attack to announce that our "noxious" conclusions have been definitively refuted. But in the same month that this most recent definitive refutation was published, the journal *Intelligence* had a special issue devoted to IQ and social policy. The articles in it are not written as defenses of *The Bell Curve*; they just happen to make our case on a wide variety of points. And that's the way the debate will eventually be resolved -- not as a judgment about a book that has been almost buried by controversy, but by continuing research on the same issues. As that happens, it is not just that Dick and I will be proved right. We will be proved to have been -- if you will pardon the expression -- conservative.

(From the pages of the *National Review*.)

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Special Review

By J. Philippe Rushton

Note: The following review by J. Philippe Rushton was originally published in *Personality and Individual Differences*, October 3, 1996. (His *National Review* article "The Mismeasures of Gould", also reprinted on this website, is a much shorter version of this review.)

SPECIAL REVIEW OF STEPHEN JAY GOULD: *The Mismeasures of Man* (Revised and Expanded Edition). New York: W. W. Norton & Co. New York. (1996) (1st Edn. 1981). 444 pp. ISBN 0-393-31425-1. \$13.95, pbk.

RACE, INTELLIGENCE, AND THE BRAIN: THE ERRORS AND OMISSIONS OF THE REVISED EDITION OF S. J. GOULD'S *THE MISMEASURE OF MAN*

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Abstract

The first edition of *The Mismeasure of Man* appeared in 1981 and was quickly praised in the popular press as a definitive refutation of 100 years of scientific work on race, brain-size and intelligence. It sold 125,000 copies, was translated into 10 languages, and became required reading for undergraduate and even graduate classes in anthropology, psychology, and sociology. The second edition is not truly revised, but rather only expanded, as the author claims the book needed no updating as any new research would only be plagued with the same philosophical errors revealed in the first edition. Thus it continues a political polemic, whose author engages in character assassination of long deceased scientists whose work he misrepresents despite published refutations, while studiously withholding from his readers fifteen years of new research that contradicts every major scientific argument he puts forth. Specific attention in this review are given to the following topics: (1) the relationship between brain size and IQ, (2) the importance of the scientific contributions of Sir Francis Galton, S. G. Morton, H. H. Goddard, and Sir Cyril Burt, (3) the role of early IQ testers in determining U.S. immigration policy, (4) *The Bell Curve* controversy and the reality of *g*, (5) race/sex/social class differences in brain size and IQ, (6) Cesare Lombroso and the genetic basis of criminal behavior, (7) between-group heritabilities, inter-racial adoption studies, and IQ (8) why evolutionary theory predicts group differences, and (9) the extent to which Gould's political ideology has affected his scientific work.

"May I end up next to Judas Iscariot, Brutus, and Cassius in the devils mouth at the center of hell if I ever fail to present my most honest assessment and best judgment of evidence for empirical truth" (p. 39). So swears one Stephen Jay Gould, justifiably worried that his activist background may have tarnished his reputation for scholarship. Critical examination of the new edition of *The Mismeasure of Man* shows that, indeed, Gould's resort to character assassination and misrepresentation of evidence have caught up with him.

Hailed in the popular media as the definitive deconstruction of the 'myth' that science is an objective enterprise, the original *The Mismeasure of Man* was in fact an *ad hominem* attack on eminent scholars, past and present, who have scientifically studied race, intelligence, and brain size. Despite the masses of empirical research using state-of-the-art technology published in highly prestigious journals that refute the obscurantist arguments Gould first served up in 1981, all the chapters of the initial edition have now been unapologetically regurgitated. Gould's failure not only to conduct any empirical research of his own but to even acknowledge the existence of any and all contradictory data speaks for itself. Revealed political truth may abhor revision but science thrives on it. Scientist that he is, Gould may yet regret agreeing to produce this 'revision'.

Rather than being appropriately revised, the original edition of *The Mismeasure of Man* has merely been expanded. Gould includes a 30-page preface on why he wrote the original and why the renewed interest in race, behavior, and evolution, required that he 'revise' it after 15 years, although he also maintains (p. 35) that his 1981 arguments needed no modification. Gould's 1996 book also contains five end chapters including essays on J. F. Blumenbach, the 19th century German anthropologist who developed the first scientific system of racial hierarchy, and Gould's own previously published reviews of Herrnstein and Murrays (1994) *The Bell Curve*.

After carefully reading the book, I charge Gould with several counts of scholarly malfeasance. First, he omits mention of remarkable new discoveries made from Magnetic Resonance Imaging (MRI) which show that brain-size and IQ correlate about 0.40. These results are as replicable as one will find in the social and behavioral sciences and utterly destroy many of Gould's arguments. Second, despite published refutations, Gould repeats verbatim his defamations of character against long deceased individuals. Third, Gould fails to respond to the numerous empirical studies that show a consistent pattern of race differences in IQ, brain size, crime, and other factors that have appeared since his first edition went to press.

Brain-Size/IQ Relations: Where Was Gould During The Decade Of The Brain?

In the opening chapters, Gould charges 19th century scientists with 'juggling' and 'finagling' brain size data in order to place Northern Europeans at the apex of civilization, lower orders trailing behind in a great chain of being. He argues that, in effect, Paul Broca, Francis Galton, and Samuel George Morton, all erred in the same direction and by similar magnitudes.

Implausibly, Gould asks us to believe that Broca 'leaned' on his autopsy scales when measuring wet brains by just enough to produce the same differences that Morton caused by 'over-packing' empty skulls using filler, as did Galton's extra loose grip on calipers while measuring heads!

Later in the book, Gould attempts to discredit such 20th century luminaries as H. H. Goddard, Lewis Terman, R. M. Yerkes, Charles Spearman, Cyril Burt, Hans Eysenck and Arthur Jensen who, Gould claims, mean-spiritedly set out to measure IQ and fabricate its heritability. Gould specifically charges psychometricians with the sin of reification, that is, treating hypothetical constructs as though they were real entities. His major target is the general factor of intelligence (known as *g*). Contrary to Gould, every major study shows that different IQ tests tend to be significantly intercorrelated (Carroll, 1993) and that *g* is the 'active ingredient' in IQ predictions (Brody, 1992).

Gould's omission of recent, devastatingly contradictory evidence constitutes at best shoddy and at worst dishonest scholarship. Even before Gould's (1981) first edition, Van Valen (1974) had reviewed the literature and estimated an overall correlation of 0.30 between brain size and intelligence. Gould (1981) neglected to even mention Van Valen's review. The 1990s have been called the 'Decade of the Brain' for good reason. Remarkable discoveries made using MRI confirm many of the relationships described by the 19th century visionaries defamed by Gould. Neither Gould nor his publisher show any scruples in releasing these chapters without the required revisions. Since Gould chose to withhold this evidence from his extensive readership, allow me to reveal it. (For more detail, see the review by Rushton & Ankney, 1996).

The published research that most clearly shows the correlation between brain size and intelligence employed MRI, which creates, *in vivo*, a three-dimensional image of the brain. An overall correlation of 0.44 was found between MRI-measured-brain-size and IQ in 8 separate studies with a total sample size of 381 non-clinical adults. This correlation is about as strong as the relationship between socioeconomic status of origin and IQ. In seven MRI studies of clinical adults ($N = 312$) the overall correlation was 0.24; in 15 studies using external head measurements with adults ($N = 6,437$) the overall correlation was 0.15, and in 17 studies using external head measurements with children and adolescents ($N = 45,056$) the overall correlation was 0.21. The head size and brain size correlation with the *g* factor itself, which Gould would have you believe is a mere artifact, is even larger --- 0.60! (Jensen, 1994; Wickett et al., 1996).

Further, the brain-size/IQ correlation is predictive from birth. The National Collaborative Perinatal Study analyzed data from 17,000 White babies and 19,000 Black babies followed from birth to 7 years (Broman *et al.*, 1987). Head perimeters were measured at birth for all children. At age 7, head perimeters were remeasured and IQ assessed. For both the Black and the White children, head perimeter measured at birth significantly predicted head perimeter at 7 years, and head perimeter at both ages predicted IQ!

The first of these MRI studies were published in the late 1980s and early 1990s in leading,

refereed, mainstream journals like *Intelligence* (Willerman *et al.*, 1991) and the *American Journal of Psychiatry* (Andreasen *et al.*, 1993). I know Gould is aware of them because my colleagues and I routinely sent him copies as they appeared and asked him what he thought! For the record, let it be known that Gould did not reply to the missives regarding the published scientific data that destroyed the central thesis of his first edition.

Further evidence of Gould's method is the way the 1996 edition deletes the very section of the 1981 edition that discussed the brain-size/IQ relation. In the 1981 edition (pp. 108-111), Gould cited Jensen's (1980) *Bias in Mental Testing* (pp. 361-362) in order to pooh-pooh Jensen's report of a 0.30 correlation between brain-size and IQ and a table from Hooton (1939) which showed that average head sizes differed by SES. Gould (1996) gives no reason for making this selective cut, which would have appeared on page 140 of the new edition. I can only infer that when Gould read Jensen's (1982) review of his book, which he mentions doing in the introduction, he realized that Jensen's citation of the 0.30 correlation between brain size and IQ was based on Van Valen's (1974) review and so could no longer be dismissed as just Jensen. I submit that Gould realized that repeating this section verbatim, given the weight of the new evidence, would destroy his entire thesis. Rather than revise his arguments in light of the truth, Gould chose to repeat them without change and to withhold any evidence to the contrary. Both Gould and his publisher owe it to their readers to explain why this supposedly 'new' edition studiously avoids any mention of all the new evidence.

Is it reasonable to expect that brain size and cognitive ability are related? Yes! Haug (1987, p.135) found a correlation of 0.479 ($N = 81$, $P < 0.001$) between number of cortical neurons (based on a partial count of representative areas of the brain) and brain size in humans. His sample included both men and women. The regression relating the two measures is: number of cortical neurons (in billions) = $5.583 + 0.006 (\text{cm}^3 \text{ brain volume})$. According to this equation, a person with a brain size of $1,400 \text{ cm}^3$ has, on average, 600 million fewer cortical neurons than an individual with a brain size of $1,500 \text{ cm}^3$. The difference between the low end of the normal distribution ($1,000 \text{ cm}^3$) and the high end ($1,700 \text{ cm}^3$) works out to be 4.2 billion neurons. That amounts to 27% more neurons for a 41% increase in brain size. The best estimate is that the human brain contains about 100 billion (10^{11}) neurons classifiable into perhaps as many as 10,000 different types resulting in 100,000 billion synapses (Kandel, 1991). Even storing information at the low average rate of one bit per synapse, which would require two levels of synaptic activity (high or low/on or off), the structure as a whole would generate 10^{14} bits of information. Contemporary supercomputers, by comparison, typically have a memory of about 10^9 bits.

On Character and Character Assassination

Gould's faults extend well beyond sins of omission to include sins of commission. The 'new' edition repeats the same false accusations that have been well refuted since 1981. Thus, Gould leaves unmodified his denigration of Sir Francis Galton as a 'dotty Victorian eccentric' (p. 108)

despite having been called to account for painting a thoroughly tendentious portrait by University of Cambridge statistician, A. W. F. Edwards (1983) in the *London Review of Books*. Edwards rightly excoriated Gould, as the author of a book full of references to correlation, regression (including multiple regression), principal components analysis, and factor analysis, for failing to inform his readers that this whole statistical methodology is derived from Galton's pioneering work on the bivariate normal distribution and linear regression.

Gould also repeats verbatim his (1981) claim that S. G. Morton (1799-1851), one of the giants of 19th American science, 'unconsciously' doctored his results on cranial capacity so as to prove Caucasian racial superiority, despite the fact that when J. S. Michael (1988) remeasured a random sample of the Morton collection he found that very few errors had been made, and that these were not in the direction that Gould had asserted. Instead, the errors were in Gould's own work! Michael concluded that Morton's research "was conducted with integrity...(while)...Gould is mistaken" (p. 353).

Other refutations of Gould's original edition of *The Mismeasure of Man* appeared in the 1987 and 1988 issues of the *American Psychologist*. Gould claimed to have detected "conscious skullduggery" in Goddard's (1912) study of the heritability of feeble-mindedness in the Kallikak family and alleged that Goddard's photographs had been 'phonied' by inserting heavy lines to give the eyes and mouth a 'depraved', 'sinister', and 'diabolical appearance'. However, not only was such retouching common during the period and thus betrays no evil intent (Fancher, 1987), but the retouched photographs actually strike judges (when empirically tested) as appearing kind (Glenn & Ellis, 1988).

Similarly, Gould repeats his trashing of Sir Cyril Burt's reputation, citing the initial verdict against him by Hearnshaw (1977) and avoiding any mention of the new evidence that has since come to light. Recall that Burt (1883-1971) was the distinguished British educational psychologist who reported a heritability for IQ of 77% for identical twins reared apart. Subsequently, he was widely accused of fabricating his data. However, five separate studies of identical twins raised apart have now corroborated Burt's finding (Jensen, 1992; see also Bouchard *et al.*, 1990; Pedersen *et al.*, 1992). The average heritability from these studies is 75%, almost the same as Burt's supposedly 'faked' heritability of 77%. Moreover, two independently written, meticulously thorough books, one by Robert B. Joynton (1988) and the other by Ronald Fletcher (1991), have vindicated Burt and described how he was railroaded by those on both sides of the Atlantic dedicated to destroying hereditarian findings.

Early IQ Testers, Immigration, And The Holocaust

Gould's most inflammatory allegation consists of blaming IQ testers for magnifying the toll of those lost in the Holocaust (p. 263). Here he has followed the lead of Leon Kamin's (1974) *The Science and Politics of IQ*. The Kamin-Gould thesis is that early IQ testers claimed their research proved that Jews as a group scored low on their tests and that this finding was then

conveniently used to support passage of the restrictive Immigration Act of 1924 which then denied entry to hapless Jewish refugees in the 1930s. Gould goes so far as to claim (1996, pp. 195-198; 255-258) that Henry H. Goddard (in 1917) and Carl C. Brigham (in 1923) labeled four-fifths of Jewish immigrants as "feeble-minded ... morons".

The facts are very different. Goddard wanted to find out if the Binet test was as effective at identifying 'high-grade defectives' (the term then used for those with mental ages between eight and twelve) among immigrants as it was among native-born Americans. By 1913, Goddard had translated the Binet test into English and arranged, over a two-and-a-half-month period, for it to be given to a subset of Jewish, Hungarian, Italian, and Russian immigrants "preselected as being neither 'obviously feeble-minded' nor 'obviously normal'" (Goddard, 1917, p. 244, emphasis added). Among this "unrepresentative" group (178 subjects in all), the tests successfully categorized 83% of the Jews, 80% of the Hungarians, 79% of the Italians, and 87% of the Russians. Goddard (1917) explicitly did *not* assert that 80% of Russians, Jews, or any immigrant group in general were feeble minded *nor* that the figures were representative of all immigrants from those nations. *Nor* did he claim that the feeblemindedness he was measuring was due to heredity. The vast majority of the many immigrants going through Ellis Island were never given mental tests. Nor was a random sample of any national group of immigrants ever tested. The only study by Goddard involving the testing of immigrants begins with the following sentence: "This is not a study of immigrants in general but of six small highly selected groups..." (1917, p. 243).

Gould's account of Brigham's (1923) *A Study of American Intelligence* is also misleading. Brigham examined the First World War intelligence tests given to 15,543 White officers, 93,955 White recruits, and 23,596 'Negro' recruits. The White recruits were subdivided into 81,465 native born ('Nordic' in origin) and 12,492 foreign born (categorized by country of origin as being primarily 'Nordic', 'Alpine', or 'Mediterranean'). Brigham found that U.S.-born White officers averaged a 'mental age' of about 17.3, U.S.-born White draftees about 13.3 years, foreign-born English speaking Nordics about 13.4 years, foreign-born non-English speaking Nordics about 12.6 years, foreign-born Alpines about 11.7 years, foreign-born Mediterraneans about 11.5 years, and Negroes about 10.7 years. Brigham made only passing reference to Jewish IQ (pp. 187-190) noting that no separate scores existed for them. But, by assuming that the proportions from the U.S. Census of 1910 were generalizable to his army recruits (implying that 50 percent of his Russian-born sample was Jewish, and that the Jewish subset scored about the same as other Russians), Brigham concluded that their mean mental age could be estimated at about 11.5 years. Brigham concluded that these data, taken at face value, did "tend to disprove the popular belief that the Jew is highly intelligent" (p. 190), but he immediately qualified this by noting that the standard deviation of the Russian sample was the highest of any immigrant group and that talent searches in New York and California schools often found high ability among Jewish children. Nonetheless, he did remark, somewhat snidely, that "the able Jew is popularly recognized not only because of his ability, but because he is able and a Jew" (p. 190).

For all their faults, the true story of the early IQ testers is a far cry from Gould's attempt to label them as unindicted co-conspirators in genocide. What is especially vexing about Gould's account is that he repeats it despite widely disseminated refutations. Historian of psychology Franz Samelson (1975, 1982) began the process of setting the record straight with his review of Kamin's book in the journal *Social Forces*. Perhaps the most incisive of these refutations appeared in a paper by Mark Snyderman and the late Richard Herrnstein in the 1983 issue of the *American Psychologist*. Snyderman and Herrnstein fully corroborated Samelson's conclusions, pointing out that the testing community in general did not view its findings as favoring restrictive immigration policies like those in the 1924 Act. As far as Snyderman and Herrnstein could ascertain from the records and publications of the time, Congress took virtually no notice of intelligence testing. None of the major contemporary figures in testing were called to testify, nor were any of their writings inserted into the legislative record.

In his 1981 book *In Search of Human Nature*, the eminent historian Carl N. Degler took Gould to task for ignoring contradictory information. Degler pointed out, for example, that it was the evidence of high IQs in Jews and Chinese in California that led Lewis Terman to strengthen his view that the low Black IQ was heritable. Degler also pointed out that although the comparatively high scores of Orientals did not prevent them from being excluded from immigration, such scores *would* embarrass any attempt to make IQ the basis for ethnic bias in immigration. Again, in 1992, the noted columnist Daniel Seligman debunked Gould's anti-testing propaganda in his book *A Question of Intelligence*. Most revealing of Gould's scholarship, perhaps, is that Herrnstein and Murray (1994) also highlighted the issue in a special boxed section on page 5 of *The Bell Curve*, a book that Gould reviewed (twice!). Did Gould overlook these refutations? Why did he not respond to them in his 'revision'?

The early IQ testers were far more aware of the effects of environmental and cultural background on their test takers than Gould would have you believe. They clearly stated that many high-IQ groups had been excluded from the draft sample, including those in occupations exempted from the draft as being vital to the war effort. Gould acknowledges these facts (p. 252) but puts on the spin that if Yerkes (1921) knew of flaws in his massive monograph *Psychological Examining* in the United States Army, from which Brigham (1923) drew his data, this only made the conclusions even more obviously biased than they otherwise would have been.

The reality of g?

Eighty years of theoretical and applied progress, unrivalled in virtually any other field of psychology, have done nothing to diminish the fervor of Gould's anti-psychometric zealotry. In his review of *The Bell Curve*, Gould (1996, pp. 370-376) charges Herrnstein and Murray (1994) with 'disingenuousness'. First, Gould alleges disingenuousness of content, for he claims that *The Bell Curve* is really about race, but pretends to be about IQ. Second, he alleges there is disingenuousness of argument, for *The Bell Curve* fails to report openly the strength of statistical

relationships. Finally, he claims there is disingenuousness of political program, for *The Bell Curve* attempts to justify cutting social programs while claiming to be in the tradition of Jeffersonian democracy.

Gould withholds from his readers that *The Bell Curve* is mainly an empirical work about the causes of social stratification and that it reached its conclusions only after fully analyzing a 12-year longitudinal study of 12,486 youths (3,022 of whom were African American) which showed that most 17-year-olds with high IQs (Blacks as well as Whites) went on to occupational success by their late 20s and early 30s whereas many of those with low IQs (both Black and White) went on to welfare dependency. The average IQ for African Americans was found to be lower than those for Latino, White, Asian, and Jewish Americans (85, 89, 103, 106, and 115, respectively, pp. 273-278). Failure to mention these data fosters the false belief that IQ tests are not predictive and are biased in favor of North Europeans.

In an afterword to the softcover edition of *The Bell Curve*, Charles Murray (1996) chides Gould and his reviews for being hopelessly out of date regarding the evidence for the biological basis of g and for dismissing as 'trivial' the predictive power of IQ in *The Bell Curve* sample. Murray invites Gould to "count the ways" in which g does in fact capture "a real property in the head". The higher the g loading of a subtest, the higher is its heritability, the higher the degree of inbreeding depression (an established genetic phenomenon) a test exhibits, the higher its relation to elementary cognitive tasks like reaction time, and the more it is related to physiological processes such as cortical evoked potentials and the brains consumption of glucose. Murray also accuses Gould of misleading readers by focusing on the R^2 statistics given in the appendix, rather than on the IQ predictions given in the text. As Murray concludes "The relationships between IQ and social behaviors that we present in the book are so powerful that they will revolutionize sociology" (p. 569).

Gould likes to leave his readers chanting the mantra that " g is nothing more than an artifact of the mathematical procedure used to calculate it". Jensen and Weng (1994) and Carroll (1995) provide detailed empirical and analytical demonstrations of the reality of g . Suffice to note for the purposes of this review that they find that g is remarkably robust and invariant across different data sets, different statistical procedures, or even simulated data, and that Gould avoids any mention of these studies.

Race and IQ: What Gould Doesn't Want You To Know

In his critique of *The Bell Curve*, Gould acknowledges (p. 369), and then quickly sidesteps the finding that Orientals have a small average IQ advantage over Whites and a large one over Blacks, despite being aware that *The Bell Curve* brought Richard Lynn's (1991) detailed compilation of these data to wide attention. Because Gould dodged the issue allow me to address it. Lynn (1991, 1996) showed that, on average, Orientals score higher on tests of mental ability than do Whites, both within the U.S.A. and in Asia, whereas Africans and Caribbeans score

lower. Oriental populations in East Asia and North America typically have mean IQs falling between 101 to 111. White populations in Europe, South Africa, Australasia, and North America have mean IQs of from 85 to 115, with an overall mean of 100. Black populations living south of the Sahara, in the Caribbean, in Britain, and in North America, average IQs of from 70 to 90.

Especially contentious was Lynn's calculation of a mean IQ of only 70 for Black Africans living south of the Sahara. Many reviewers have expressed skepticism about such a low IQ, holding it impossible that, by European standards, 50 percent of Black Africa is 'mentally retarded'. But a mean African IQ of 70 has been confirmed in three studies since Lynn's review, each of which used Raven's Progressive Matrices, a test regarded as an excellent measure of the non-verbal component of general intelligence and one not bound by culturally specific information. Kenneth Owen (1992) found it (a mean IQ of 70) in a sample of over 1,000 South African 13-year-olds, Fred Zindi (1994), a Black Zimbabwean, found it in a study of 12- to 14-year olds in Zimbabwe, and Richard Lynn (1994a) found it in a study of Ethiopian immigrants to Israel. In a reply to Leon Kamin regarding these data, Charles Murray (1995) wrote: "When data are as carefully collected and analyzed as these, attention must be paid" (p. 22).

Speed of decision making (reaction time) in 9- to 12-year olds, in which children decide which of several lights stands out from others, shows that the racial differences in mental ability are not restricted to paper and pencil tests. All children can perform the task in less than one second, but more intelligent children, as measured by traditional IQ tests, perform the task faster than do less intelligent children. Lynn (1991) found Oriental children from Hong Kong and Japan were faster on average in decision time (controlling for movement time) than were White children from Britain and Ireland, who in turn were faster than Black children from South Africa. Using the same decision time tasks, Jensen (1993) found the same racial ordering in California school children.

Race and Brain Size: What Gould Doesn't Want You To Know

It seems unlikely that Gould's scornful remarks about early studies of racial differences in brain size were based on an objective assessment of the literature. First, investigation of the studies Gould does cite show him up to his usual tricks of hiding and distorting data. Second, although numerous modern studies have appeared since his 1981 edition went to press, he fails to make the corrections required by them or even to acknowledge their existence.

Consider, for example, a section titled "A Curtain Raiser With a Moral". In this, Gould (1996, 109-114) reviewed a technical debate over Black/White brain-size differences between Robert Bennett Bean (1906), a Virginia physician, and Franklin P. Mall (1909), Beans mentor at Johns Hopkins Medical School. Bean (1906) published a study finding that the weight of 103 American Negro brains at autopsy varied with the amount of Caucasian admixture, from 0 admixture = 1,157 grams, 1/16 = 1,191 grams, 1/8 = 1,335 grams, 1/4 = 1,340 grams, to 1/2 = 1,347 grams. Bean also reported that the 103 Negro brains were less convoluted than were 49

White brains and that Whites had a proportionately larger genu to splenium ratio (front to back part of corpus callosum), implying that Whites may have more activity in the frontal lobes which were thought to be the seat of intelligence. Mall (1909) disagreed and found that he was unable to replicate the results on genu/splenium ratios when he remeasured a subset of the brains under 'blind' conditions regarding the race of the brain. Gould elevated this disagreement on one of the findings into a morality play. (Mall "became suspicious"; "prior prejudice dictates conclusions"). What Gould neglects to tell us is that Mall himself (p. 7) reported a Black/White difference in brain weight of 100 grams and that he did not refute the data on racial admixture or on complexity of convolutions.

J. S. Michael's (1988) revelation of Gould's mistreatment of Samuel George Morton's 19th century data has been described above. Nonetheless, Michael remained doubtful that Morton's data could be used to examine race differences in brain size. Rushton (1989a), however, showed that Morton's data, even as reassessed by Gould, indicated that in cubic inches, Mongoloids averaged 86.5, Caucasoids 85.5, and Negroids 83.0, which convert to 1,401, 1,385, and 1,360 cm³, respectively. To be absolutely clear there is no misunderstanding about these data and to allow readers to combine the subgroups in their own preferred ways, Table 1 presents Gould's own retabulation of Morton's data (1981, p. 66, Table 2.5; 1996, p. 98, Table 2.5). Gould dismisses these differences as "trivial". But, as noted, a difference of 1 cubic inch (16 cm³) in brain size translates into a very nontrivial millions of neurons and hundreds of millions of synapses.

Table 1. S.J. Gould's 'corrected' final tabulation of Morton's assessment of racial differences in cranial capacity

Population	Cubic inches	Cubic centimeters
Native Americans	86	1410
Mongolians	87	1427
Modern Caucasians	87	1427
Malays	85	1394
Ancient Caucasians	84	1378
Africans	83	1361

Finally, consider the pattern of decreasing mean brain size going from East Asians to Europeans to Africans shown in Rushton's (1989a) reanalysis of Gould's retabulation of Morton's data. This pattern has been corroborated since 1980 by three different techniques: wet brain weight at autopsy, volume of empty skulls using filler, and volume estimated from external head sizes. Recently, a fourth technique, Magnetic Resonance Imaging (MRI), has confirmed the

White/Black difference. The preponderance of evidence from studies using different techniques, conducted by different researchers, on different samples, confirms the conclusion that the brains of Orientals and their descendants average about 17 cm³ (1 in³) larger than those of Europeans and their descendants whose brains average about 80 cm³ (5 in³) larger than those of Africans and their descendants.

Consider the following statistically significant comparisons (sexes combined) from recently conducted studies using the four techniques mentioned above. Using brain mass at autopsy, Ho *et al.* (1990) summarized data for 1,261 individuals. They reported a mean brain weight of 1,323 grams for White Americans and 1,223 grams for Black Americans. Using endocranial volume, Beals *et al.* (1984) analyzed about 20,000 skulls from around the world and found that East Asians, Europeans, and Africans averaged cranial volumes of 1,415, 1,362, and 1,268 cm³ respectively. Using external head measurements from a stratified random sample of 6,325 U.S. Army personnel, Rushton (1992) found that Asian Americans, European Americans, and African Americans averaged 1,416, 1,380, and 1,359 cm³, respectively. Using external head measures from tens of thousands of men and women from around the world collated by the International Labour Office, Rushton (1994) found that Asians, Europeans, and Africans averaged 1,308, 1,297, and 1,241 cm³, respectively. Finally, an MRI study in Britain found that people of African and of Caribbean background averaged a smaller brain volume than did those of European background (Harvey *et al.*, 1994).

Contrary to most purely environmental theories, racial differences in brain size show up early in life. Data from the U.S. National Collaborative Perinatal Project on 19,000 Black children and 17,000 White children showed that Black children had a smaller head perimeter at birth and, although Black children were born shorter in stature and lighter in weight than White children, by age 7 'catch-up growth' led Black children to be larger in body size than White children. However, Blacks remained smaller in head perimeter (Broman *et al.*, 1987). Further, head perimeter at birth, 1 year, 4 years, and 7 years correlated with IQ scores at age 7 in both Black and White children ($r = 0.13$ to 0.24).

Sex Differences: What Gould Doesn't Want You To Know

An absolute difference in brain size between men and women has not been disputed since at least the time of Broca (1861). He assembled a series of 292 male brains and found an average weight of 1,325 grams, while 140 female brains averaged 1,144 grams, a difference of 181 grams. Gould claimed that the sex difference disappears when appropriate statistical corrections are made for body size or age of people sampled. However, when Gould used multiple regression to remove the simultaneous influence of height and age, he only succeeded in reducing the sex difference by one third, to 113 grams. Gould then invoked additional unspecified age and body parameters, claiming that if these could be controlled the entire difference would disappear.

David Ankney (1992) questioned Gould's methodology. He reexamined autopsy data on 1,261 American adults (Ho *et al.*, 1980) and found that at any given body surface area or height, mens brains are heavier than are womens brains. For example, among those who are 168-cm tall (5' 7"; the approximately overall mean height for men and women combined), brain mass of men averages about 100 g heavier than that of women, whereas the average difference in brain mass, uncorrected for body size, is 140 g. Thus, only about 30% of the sex difference in brain size is due to differences in body size.

Ankney's (1992) results were confirmed in the study of cranial capacity in a stratified random sample of 6,325 U.S. Army personnel (Rushton, 1992). After adjustment, via analysis of covariance, for effects of age, stature, weight, military rank, and race, men averaged 1,442 cm³ and women 1,332 cm³. This difference was found in all of 20 or more separate analyses performed to rule out any body-size effect (see Rushton, 1992; pp. 406-408). Moreover, the male/female difference was replicated across samples of Asians, Whites, and Blacks, as well as across samples of officers and enlisted personnel. The sex difference of 110 cm³ found by Rushton (1992) from analysis of external head measurements is remarkably similar to the 100 grams obtained in Ankney's (1992) analysis of brain mass (1 cm³ = 1.036 grams, Hofmann, 1991).

The brain size studies do present a paradox. Women have proportionately smaller brains than do men but, apparently, the same intelligence scores. This was recognized in stronger form over 100 years ago. Gould cites G. Hervé, a colleague of Broca's, who wrote in 1881; "Men of the black races have a brain scarcely heavier than that of a white woman." Gould's (1996, p. 135) response was a political one, namely "I do not regard as empty rhetoric a claim that the battles of one group are for all of us". David Ankney (1992, 1995) had a more scientific response. He suggested that the difference in brain size relates to those intellectual abilities at which men excel; that spatial and mathematical ability may require more "brain" power than do verbal abilities. Other theories are that men average slightly higher in general intelligence than do women (Lynn, 1994b); or that these particular differences in brain size have nothing to do with cognitive ability but reflect greater male muscle mass and physical co-ordination on tasks like throwing and catching.

Social Class: What Gould Doesnt Want You To Know

As mentioned earlier, Gould inexplicably deleted a table which showed that averaged head sizes increased with each of 8 steps of vocational status from Hooton (1939) that had appeared on p. 109 of his first edition. Numerous other nineteenth- and early twentieth-century data sets (Broca, 1861; Sorokin, 1927; Topinard, 1878) confirmed that people of higher status occupations averaged a larger brain or head size than did those in lower ones. For example, Galton collected head measurements and information on educational and occupational background from thousands of individuals at his laboratory in the South Kensington Natural History Museum in London. However, he had no statistical method for testing the significance of the differences in

head size between various occupational groups. Nearly a century later, Galton's data were analyzed by Johnson *et al.* (1985), who found that the professional and semiprofessional groups averaged significantly larger head sizes (both length and width) than did unskilled groups. The results were striking for men but less clear-cut for women. Rushton and Ankney (1996) calculated cranial capacities from Johnson *et al.*'s (1985) summary of Galton's head-size data and found that cranial capacity increased from unskilled to professional classes from 1,324 to 1,468 cm³ in men but only from 1,256 to 1,264 cm³ in women (figures uncorrected for body size). Gould mentions none of this more recent work in his purported revision.

Natural Born Criminals: What Gould Doesn't Want You to Know

In his revised edition, Gould (pp. 151-175) continues to ridicule the 'ape-in-some-of-us' hypothesis proposed by Cesare Lombroso (1836-1909), the Italian physician and anthropologist who founded the discipline of criminology. Lombroso argued that many criminals were throwbacks to man's ancestral past, ill-suited to life in civilized society, and that therefore 'natural born criminals' could be identified by the presence of the anatomical signs of primitiveness he termed 'stigmata'. But, contrary to Gould, Lombroso was no monomaniac and also believed that criminal behavior could arise in 'normal' men.

Lombroso carried out several anthropometric surveys of the heads and bodies of criminals and noncriminals, including a sample of 383 crania from dead convicts. He claimed that, as a group, criminals evidenced many features he considered primitive, including smaller brains, thicker skulls, simpler cranial sutures, larger jaws, preeminence of the face over the cranium, a low and narrow forehead, long arms, and large ears. Lombroso also examined African tribes in the Upper Nile region finding so many of these allegedly primitive traits that he concluded criminality would be considered normal behavior among them.

While Gould delights in lampooning such early evolutionary thinking, he fails to tell his readers that though Lombroso's description of the individual trees was distorted by the prejudicial lens of his time, he correctly saw the forest. Lombroso was the first to understand how Darwin's theory of evolution provides a biological understanding for why some people are more prone to criminality than are others, how certain physical indicators allow us to predict criminality, and to recognize the critical role of the forebrain in inhibiting violent and antisocial behavior.

The reader of *The Mismeasure of Man* will search in vain for even a dismissing reference to any of the following recent studies of the biological correlates of criminal behavior. Raine (1993) reviewed several studies that used the state-of-the-art techniques of Computerized Tomography (CT), Magnetic Resonance Imaging (MRI), and Positron Emission Tomography (PET) to study the brains of violent and sexual offenders. He tentatively concluded that frontal lobe dysfunction was associated with violent behavior including rape. Moreover, given the relation between brain size and IQ (Rushton & Ankney, 1996; see above), Lombroso's finding of a smaller brain in criminals relative to non-criminals is likely correct. Numerous American studies from those of

H. H. Goddard in 1917 to the present, including *The Bell Curve's* 12 year longitudinal study of over 12,000 youth (Herrnstein & Murray, 1994), have established the predictive relationship between IQ and crime.

Nor does Gould feel compelled to let his readers know that Lombroso's ideas have received considerable support from recent work in behavioral genetics, a science that barely existed when Lombroso conducted his pioneering work. The same 1993 review by Raine (neither cited nor mentioned by Gould) describes 10 twin studies of adult crime based on official convictions. These studies yielded 13 analyses that together gave a concordance rate for criminal behavior of 52% for 202 monozygotic twins and only 21% for 345 dizygotic twins.

American, Danish, and Swedish studies of children who were adopted in infancy provide a means of testing the genetic theory of criminal behavior against the environmental theory. These studies support the findings of the twin studies and Lombroso's theory of 'natural born criminals'. Adopted children were at greater risk for criminal convictions if their biological parents had been convicted of a crime than if their adoptive parents had been. In a Danish study of some 14,000 adoptees, boys who had neither adoptive nor biological criminal parents, themselves had a 14% rate of criminal conviction. If the adoptive, but not biological parents were criminals, boys still had a conviction rate of only 15%. But if the biological but not adoptive parents were criminal, the rate increased to 20%. And, if both biological and adoptive parents were criminal, the rate increased to 25% (Mednick *et al.*, 1984).

Studies that use self-reports of criminal behavior tell the same story as do studies of official arrest records. In one massive study, Rowe (1986) sampled almost all the eighth to twelfth graders in the Ohio Public Schools and found that MZ twins were roughly twice as alike in their self-report delinquency as were DZ twins, yielding a heritability of about 50%. Another recent study (Rushton, 1996) of 274 adult twin pairs used retrospective self-reports about destroying property, fighting, carrying and using a weapon, and struggling with the police and found a 50% heritability for such violent behaviors. Questionnaire studies of related traits such as altruism, aggression, and empathy in adults also typically show a 50% heritability (Rushton *et al.* 1986). Within the same family (that is, where socioeconomic status is identical), studies show it is the less intelligent and the more aggressive siblings who are more prone to delinquency.

Nor is Lombroso's concept of stigmata as far out as Gould would have you believe. In fact, the theory of bodily markers of abnormal behavior is making a comeback, albeit from an environmentalist as well as a genetic perspective. During gestation, an insult to the fetus (such as a drug in the mothers body) that disturbs brain development, may simultaneously produce a minor physical anomaly (termed an MPA) on the external body surface. For example, during the course of pregnancy, the ears start low on the neck of the fetus and gradually drift into their standard positions. An insult to development can prematurely stop this upward migration of the ears and result in low-set ears -- an observable MPA. Thus, the number of MPAs serves as a rough index of (perhaps hidden) central nervous system anomalies. For children raised in

unstable families, Raine (1993) found that the number of MPAs at age 12 year was related to violent behaviors at age 21. More generally, Raines review found that antisocial children often appear markedly less attractive than normal children. In one sample of over 11,000 criminals and 7,000 controls, 60% of criminals but only 20% of controls had facial deformities, as judged by expert plastic surgeons.

Finally, consider the striking racial differences in criminal behavior. These differences are consistent across time, national boundaries, and political-economic system, which argues strongly for their having some genetic component. For example, as far back as records go, in the U.S., Orientals have been underrepresented and Blacks overrepresented in crime statistics relative to Whites. This pattern is not specific to the U.S. but is repeated around the world. Analyses of INTERPOL Yearbooks throughout the 1980s show that African and Caribbean countries have double the rate for violent crime of European countries and three times the rate of the countries in the Pacific Rim. The combined figures for murder, rape, and serious assault per 100,000 population for 1984 and 1986 were Africans -- 142, Europeans -- 74, and Asians -- 43. For 1989-90, the pattern was unchanged: Africans -- 240, Europeans -- 75, and Asians -- 32 (Rushton, 1990, 1995a).

It is unfortunate that Gould does not even cite, let alone attempt to refute any of these studies. Even if all of them are in some way biased and all my reasoning flawed, Gould owes it to those who rely upon his work to explain how this is so. More unfortunate is that by dismissing out of hand the hypothesis of the inclination to criminal behavior by some sneering remarks on the early work of the long-dead Lombroso and ignoring the latest research, Gould is actively obstructing scientists from finding the biogenetic treatments and environmental intervention strategies that could spare both future victims and delinquents (who, in their own way, are victims of their genes and their environments). It is thus Gould who is -- in Lombosos words -- the delinquent man.

Between-Group Heritabilities: What Gould Doesnt Want You to Know

Gould (1996, pp. 186-187, 369-370) continues to disparage the possibility of generalizing within-group findings to the causes of between-group differences. When environmentalists use nutrition as an explanation of both within-group and between-group differences this is (sensibly) not disputed. But when the exact same inference is made for heritabilities to explain both within-group and between-group differences, Gould argues it is inappropriate. But, if poor nutrition is shown to have an effect 'within' Whites and Blacks, it is sensible to suppose that nutrition has an effect on differences 'between' Whites and Blacks. If so for environmental generalization, why not for genetic generalization?

What Gould especially fails to mention is the striking and critically important finding that 'genetic weights on IQ subtests predict racial differences'. Although the White/Black IQ gap averages 15 points, the difference 'is more pronounced on subtests that are highly heritable

within races than it is on less heritable tests' (Jensen, 1985, Rushton, 1989b). This observation is important because it provides a test of differential predictions. Environmental theory predicts that racial differences will be greater on more culturally or environmentally influenced tests whereas genetic theory predicts they will be greater on more heritable tests. Because higher heritabilities are stronger indicators of underlying genetic substrates than are lower heritabilities, the data support the genetic hypothesis, not Gould.

It is in fact an important 'empirical' question whether heritabilities for Blacks are the same as, or different from, those for Whites. Reason alone tells us that as environments become more benign and more equal, genetic sources of variation will become larger. For example, over the last 50 years, as environmental barriers to health and educational attainment have fallen, the variance in health and educational attainment accounted for by genetic factors has increased (Scriber, 1984; Heath *et al.*, 1985). In animal studies, low heritabilities for body size variables are typically interpreted as showing the suppressant effect of the environment on natural growth (e.g. Larsson, 1993). The relevant question thus becomes: 'Are IQ heritabilities for Blacks lower than those for Whites?' Most of the evidence favors the view of equal heritabilities across the three major races. There is, however, some evidence of lower heritabilities in Blacks which would support the hypothesis of a more damaging environment. For example, Rushton and Osborne (1995) studied cranial capacity in several hundred Black and White twins and found a range of higher heritabilities (depending on corrections for age and body size) for Whites than for Blacks (47% to 56% vs 12% to 31%). The differences, however, were not statistically significant. These are, however, precisely the kinds of analyses Gould should be conducting if he wants to make a scientific, rather than a political argument about heritability!

Most transracial adoption studies also provide evidence for the heritability of racial differences in IQ. Studies of Korean and Vietnamese children adopted into White American and white Belgian homes have been conducted (Clark & Hanisee, 1982; Frydman & Lynn, 1989; Winick *et al.*, 1975). As babies, many adoptees had been hospitalized for malnutrition. Nonetheless, they went on to develop IQs 10 or more points higher than their adoptive national norms. By contrast, Black and Mixed-Race (Black/White) children adopted into White middle class families typically perform at a lower level than similarly adopted White children. For example, in the well known Minnesota Adoption Study, by age 17, adopted children with two White biological parents had an average IQ of 106, adopted children with one White and one Black biological parent had an average IQ of 99 and adopted children with two Black biological parents had an average IQ of 89 (Weinberg, Scarr & Waldman, 1992).

The only adoption studies Gould refers to (p. 370) are those showing IQ gains of very young Black children adopted into affluent and intellectual homes (presumably based on an earlier account of the Minnesota study when the children were only 7 years old) and a study of prepubertal mixed-race German children fathered by Black soldiers compared with those fathered by White soldiers which found 'no difference'. But these apparent exceptions may 'prove the rule'. In general, behavior genetic studies show that as people age, trait heritability

increases while environmentality decreases. Differences not apparent before puberty often emerge by age 17.

Evolutionary Selection: What Gould Doesn't Want You To Know

Given that Gould doesn't believe that either brain size or intelligence differ by race and sex it is not surprising that he offers no evolutionary explanations for the origins of these differences. Gould (p. 399) acknowledges the accumulating evidence in favor of the 'Out of Africa' model of human origins. It holds that *Homo sapiens* arose in Africa 200,000 years ago, exited Africa with an African/non-African split about 110,000 years ago, and migrated east with a European/East Asian split about 40,000 years ago (Stringer & Andrews, 1988). But, Gould refuses to acknowledge any relationship between this evolutionary sequence and the parallel rankings of major racial groups in behavioral traits. Nor does he tell his readers that evolutionary selection pressures were different in the hot savanna where Africans evolved than in the cold Arctic where East Asians evolved.

Rushton (1995b) and others have proposed that the farther north the populations migrated, out of Africa, the more they encountered the cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children during prolonged winters. Consequently, as the original African populations evolved into present-day Europeans and East Asians, they did so by moving in the direction of larger brains and greater intelligence, but also towards slower rates of maturation, lower levels of sex hormone, and concomitant reductions in sexual potency and aggressiveness, and increases in family stability and social conformity.

Such an evolutionary scenario fits the data from Rushton's (1995b) review of the international literature on race differences which found that on more than 60 variables Orientals and Africans consistently averaged at opposite ends of a continuum with Europeans averaging intermediately. For example, the rate of dizygotic twinning based on a double ovulation is less than 4 per 1,000 births among East Asians, 8 among Europeans, and 16 or greater among Africans. Multiple birthing is known to be heritable through the race of the mother. No known environmental factor can explain why Africans average the smallest brains and the highest twinning rates, East Asians average the largest brains and the lowest twinning rates, and Europeans average intermediately in both. Clearly, there is a need for a genetic-evolutionary explanation.

In fact, Vincent Sarich, who helped initiate the research program on biochemical taxonomy from which the 'Out of Africa' model developed (Sarich & Wilson, 1967), argues that Gould got his evolutionary ideas about race completely upside down. As Sarich (1995, p.86) pointed out, "it is the Out of Africa model, not that of regional continuity, which makes racial differences more functionally significant. It does so because the amount of time involved in the riation process is much smaller, while, obviously, the degree of racial differentiation is the same -- large. The shorter the period of time required to produce a given amount of morphological difference, the more selectively important the differences become." Sarich (1982, 1995) has labelled the

argument that natural selection would result in geographically separated populations evolving the exact same brain size 'behavioral creationism'. Although Gould is comfortable talking about the evolution of different body types in humans, he often writes as though he believes that societies, cultures, and mental differences spring into being full-blown, as if from the brow of Zeus or the hand of God.

With respect to the evolution of sex differences in brain size, Ankney (1992, 1995) hypothesized that differing roles of men and women during human evolution produced a sexual divergence in brain size and in abilities. Men roamed from the home base to hunt, which would select for targeting ability and navigational skills; women were relatively sedentary. Such additional abilities would have selected for relatively larger brains in men as it may require more brain tissue to process spatial information. Lynn (1994b) has also proposed that men evolved larger (more costly) brains because they enhance their probability of becoming socially dominant and thus more reproductively successful; female reproductive success is much less dependent on social status.

Conclusion: Case Closed

Others have speculated on the extent to which Gould's political outlook has colored his scientific work (Davis, 1986; Dennett, 1995, Ruse, 1993). In *Darwins Dangerous Idea*, Dennett (1995) brilliantly documents how Gould has been systematically misleading his readers for decades, attempting to smuggle anti-Darwinian mechanisms into evolutionary theory with a lot of clever talk of "spandrels" "punctuated equilibrium", and "dialectical processes". Gould notwithstanding, Darwinian adaptation is *the* way evolution works and *the* mechanism on which working evolutionary scientists base their research programs.

Gould himself tells us (1996, p. 19) that he originally considered titling his book *Great Is Our Sin* from Charles Darwin's remark: "If the misery of the poor be caused not by the laws of nature, but by our institutions, great is our sin." Gould avers that the scientific study of human differences in mental ability is nothing but an apology for elitist European enslavement and oppression of the rest of the world -- so it was in the beginning, is now, and ever shall be, world without end, amen. This has become the Apostle's Creed of the Adversary Culture. (Do not blame criminals from poor backgrounds, they are but helpless victims of a wicked system; affirmative action and multiculturalism must be invoked to exorcise the demons of capitalist oppression, racism, and sexism). In Gould's (1996) benediction, he keeps the faith of "political correctness", while grudgingly confessing that many see it as "leftist fascism" (his words, p. 424).

In his preface, Gould describes his background and how it has affected his work. All his grandparents were Eastern European Jews whose entry into America, he believes, Goddard "would have so severely restricted" (p. 38). Thus the book is dedicated to "Grammy and Papa Joe, who came, struggled, and prospered, Mr. Goddard notwithstanding". Gould's father fought

for the leftist International Brigade in the Spanish Civil War (p. 39). He himself actively campaigned against racial oppression in the U.S.A. and in England (p. 38). I for one admire Gould for having the candor to divulge this background. No doubt personal experience affects all scholarship (including mine). However, even the most deeply held values cannot justify withholding evidence, engaging in character assassination, and repeating unfounded charges despite published refutations.

No doubt we are all prisoners of our background as well as slaves to our genes, but facts remain facts. Brain size and IQ *are* correlated. Men *do* average larger and heavier brains than do women. Asians and Europeans *do* average larger and heavier brains than do Africans. Higher SES groups *do* average larger and heavier brains than do lower SES groups.

Perhaps more than any scientist in recent memory, Gould has wielded his influence not only as a professor of science at Harvard but also through the pages of the *New York Review of Books* and through broadcasts on educational television, to seriously and intentionally misrepresent the science and politics of IQ. By his own standard, Gould has consigned himself to the innermost circle of hell. But science, fortunately, is not religion or politics. Gould need only own up to the facts and end his career of relentless special pleading. The second edition of *The Mismeasure of Man* does not measure up to Goulds own standard of "honest assesment and best judgment of evidence for empirical truth".

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- TABLE 1S. J. Goulds Corrected Final Tabulation of Morton's assessment of racial differences in cranial capacity



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IQ Will Put You In Your Place

By Charles Murray

Imagine several hundred families which face few of the usual problems that plague modern society. Unemployment is zero. Illegitimacy is zero. Divorce is rare and occurs only after the children's most formative years. Poverty is absent - indeed, none of the families is anywhere near the poverty level. Many are affluent and all have enough income to live in decent neighbourhoods with good schools and a low crime rate. If you have the good fortune to come from such a background, you will expect a bright future for your children. You will certainly have provided them with all the advantages society has to offer. But suppose we follow the children of these families into adulthood. How will they actually fare?

A few years ago the late Richard Herrnstein and I published a controversial book about IQ, *The Bell Curve*, in which we said that much would depend on IQ. On average, the bright children from such families will do well in life - and the dull children will do poorly. Unemployment, poverty and illegitimacy will be almost as great among the children from even these fortunate families as they are in society at large - not quite as great, because a positive family background does have some good effect, but almost, because IQ is such an important factor.

"Nonsense!" said the critics. "Have the good luck to be born to the privileged and the doors of life will open to you - including doors that will let you get a good score in an IQ test. Have the bad luck to be born to a single mother struggling on the dole and you will be held down in many ways - including your IQ test score." The *Bell Curve's* purported relationships between IQ and success are spurious, they insisted: nurture trumps nature; environment matters more than upbringing.

An arcane debate about statistical methods ensued. Then several American academics began using a powerful, simple way of testing who was right: instead of comparing individual children from different households, they compared sibling pairs with different IQs. How would brothers and sisters who were nurtured by the same parents, grew up in the same household and lived in the same neighbourhood, but had markedly different IQs, get on in life?

The research bears out what parents of children with unequal abilities already know - that try as they might to make Johnny as bright as Sarah, it is difficult, and even impossible, to close the gap between them.

A very large database in the United States contains information about several thousand sibling pairs who have been followed since 1979. To make the analysis as unambiguous as possible, I have limited my sample to brothers and sisters whose parents are in the top 75 per cent of

American earners, with a family income in 1978 averaging £40,000 (in today's money).

Families living in poverty, or even close to it, have been excluded. The parents in my sample also stayed together for at least the first seven years of the younger sibling's life.

Each pair consists of one sibling with an IQ in the normal range of 90-110, a range that includes 50% of the population. I will call this group the normals. The second sibling in each pair had an IQ either higher than 110, putting him in the top quartile of intelligence (the bright) or lower than 90, putting him in the bottom quartile (the dull). These constraints produced a sample of 710 pairs.

How much difference did IQ make? Earned income is a good place to begin. In 1993, when we took our most recent look at them, members of the sample were aged 28-36. That year, the bright siblings earned almost double the average of the dull: £22,400 compared to £11,800. The normals were in the middle, averaging £16,800.

These differences are sizeable in themselves. They translate into even more drastic differences at the extremes. Suppose we take a salary of £50,000 or more as a sign that someone is an economic success. A bright sibling was six-and-a-half times more likely to have reached that level than one of the dull. Or we may turn to the other extreme, poverty: the dull sibling was five times more likely to fall below the American poverty line than one of the bright. Equality of opportunity did not result in anything like equality of outcome. Another poverty statistic should also give egalitarians food for thought: despite being blessed by an abundance of opportunity, 16.3% of the dull siblings were below the poverty line in 1993. This was slightly higher than America's national poverty rate of 15.1%.

Opportunity, clearly, isn't everything. In modern America, and also, I suspect, in modern Britain, it is better to be born smart and poor than rich and stupid. Another way of making this point is to look at education. It is often taken for granted that parents with money can make sure their children get a college education. The young people in our selected sample came from families that were overwhelmingly likely to support college enthusiastically and have the financial means to help. Yet while 56% of the bright obtained university degrees, this was achieved by only 21% of the normals and a minuscule 2% of the dulls. Parents will have been uniformly supportive, but children are not uniformly able.

The higher prevalence of college degrees partly explains why the bright siblings made so much more money, but education is only part of the story. Even when the analysis is restricted to siblings who left school without going to college, the brights ended up in the more lucrative occupations that do not require a degree, becoming technicians, skilled craftsmen, or starting their own small businesses. The dull siblings were concentrated in menial jobs.

The differences among the siblings go far beyond income. Marriage and children offer the most

vivid example. Similar proportions of siblings married, whether normal, bright or dull - but the divorce rate was markedly higher among the dull than among the normal or bright, even after taking length of marriage into account. Demographers will find it gloomily interesting that the average age at which women had their first birth was almost four years younger for the dull siblings than for the bright ones, while the number of children born to dull women averaged 1.9, half a child more than for either the normal or the bright. Most striking of all were the different illegitimacy rates. Of all the first-born children of the normals, 21% were born out of wedlock, about a third lower than the figure for the United States as a whole, presumably reflecting the advantaged backgrounds from which the sibling sample was drawn. Their bright siblings were much lower still, with less than 10% of their babies born illegitimate. Meanwhile, 45% of the first-born of the dull siblings were born outside of marriage.

The inequalities among siblings that I have described are from 1993 and are going to become much wider in the years ahead. The income trajectory for low-skill occupations usually peaks in a worker's twenties or thirties. The income trajectory for managers and professionals usually peaks in their fifties. The snapshot I have given you was taken for an age group of 28-36 when many of the brights are still near the bottom of a steep rise into wealth and almost all the dulls' incomes are stagnant or even falling. . . .

The inequalities I have presented are the kind you are used to seeing in articles that compare inner-city children with suburban ones, black with white, children of single parents with those from intact families. Yet they refer to the children of a population more advantaged in jobs, income and marital stability than even the most starry-eyed social reformer can hope to achieve.

You may be wondering whether the race, age or education of siblings affects my figures. More extended analyses exist, but the short answer is that the phenomena I have described survive such questions. Siblings who differ in IQ also differ widely in important social outcomes, no matter how anyone tries to explain away the results. Ambitious parents may be dismayed by this conclusion, but it is none the less true for all that.

A final thought: I have outlined the inequalities that result from siblings with different IQs. Add in a few other personal qualities: industry, persistence, charm, and the differences among people will inevitably produce a society of high inequalities, no matter how level the playing field has been made. Indeed, the more level the playing field, and the less that accidents of birth enter into it, the more influence personal qualities will have. I make this point as an antidote to glib thinking on both sides of the Atlantic and from both sides of the political spectrum. Inequality is too often seen as something that results from defects in society that can be fixed by a more robust economy, more active social programmes, or better schools. It is just not so.

The effects of inequality cannot be significantly reduced, let alone quelled, unless the government embarks on a compulsory redistribution of wealth that raises taxes astronomically and strictly controls personal enterprise. Some will call this social justice. Others will call it

tyranny. I side with the latter, but whichever position one takes, it is time to stop pretending that, without such massive compulsion, human beings in a fair and prosperous society will ever be much more equal than they are now.

From the Sunday Times, UK, May 25 1997.

A longer version of this article appears in the summer issue of The Public Interest. Dr. Murray is a fellow at the American Enterprise Institute (1150 17th Street NW, Washington, DC, 20036)



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Eugenics, Class, and IQ: "The Bell Curve".

A classist version of Theodore Roosevelt's "race suicide" has been resurrected in Richard Herrnstein's and Charles Murray's 1994 book, "The Bell Curve: Intelligence and Class Structure in American Life." Herrnstein and Murray argue that people with low IQ's are found in disproportionate numbers among the poor, who also have the largest families, while people at the top of the IQ scale (who also tend to be at the top of the class scale in today's technology-oriented society) have the fewest children. Assuming that intelligence is highly heritable (between 40% and 80%, according to studies of identical twins reared apart), Herrnstein and Murray warn that the average American IQ could drop as much as one percentage point every ten years, unless something is done to encourage high-IQ couples to have more children and low-IQ couples to have fewer. According to Herrnstein and Murray, we might not even be aware that IQ's are falling, because school systems keep revising curricula and tests in order to be more all-inclusive of the population. Herrnstein and Murray suggest that the government stop "subsidizing" births among poor women, in other words, cut off welfare and other benefits. They believe that poor women should be economically forced to give up their children for adoption to families of higher social class, which would have the immediate effect of raising the children's IQ's through improved environments. On the immigration side, Herrnstein and Murray argue that recent immigrants, who are increasingly from Latin America, the Middle East, Asia, and Africa, are not as intelligent or ambitious as earlier waves of immigrants because they seek America as a "welfare state" rather than "a land of opportunity." Therefore, immigration should be restricted to educated members of the professional classes. Historically, we've heard the Herrnstein-Murray arguments before, presented as "scientific findings" to Congress early in this century, on behalf of banning immigration from Asia, Africa, and Southern and Eastern Europe. The same arguments about inferior intelligence were used against Poles, Italians, Greeks, and Czechs. Birth control crusaders aimed their efforts at poor families, not only because people were having large families that they could not afford, but also out of fear that the children of the poor would crowd out the (more desirable) children of the middle classes. America seems to have survived earlier waves of "low IQ" immigrants and large families born to poor people, with no noticeable drop in population IQ. IQ's went up as people learned English and spent more time in schools.

The basic problem with any argument based on IQ is that no one can be certain what IQ tests really measure. Do they measure the individual's genetic constitution, the family's values and aspirations, the quality of the school, the effects of poverty or affluence, or all of the above in varying degrees, specific to each individual's situation? Although IQ scores may predict who will do well in school, they are not predictive about who will succeed in real life, except at the extreme ends of the scale. Before making eugenic policy recommendations for raising or lowering population IQ, it would be necessary to know far more about what IQ tests measure than we now know or can ever know in a social context of inequality. Herrnstein and Murray's hypothesis boils down to the basic eugenic distinction between "us" (who turn out to be most people, because the authors really want to find employment and a decent living for almost everyone) and "them" (those who pose dangers to the nation's IQ - such as new immigrants, single mothers on welfare, and people who score below 80 or 90 on IQ tests). The book has attracted a following because most readers can place themselves in the "us" category. Most of those in the "them" category will not be reading it. Nevertheless, it is a classic example of eugenic thought, made more dangerous by some apparent trappings of liberalism and a readable (to the authors' credit) statistical appendix.

Dorothy C. Wertz

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Eugenics: 1883-1970

Francis Galton, an eminent British scientist and cousin of Charles Darwin, introduced the word, "eugenics" into the English language (Galton, 1883). Etymologically, he took it in a straight forward manner from the Greek; eu means "good" and genic derives from the word for "birth". He used the word eugenics to characterize efforts to produce children who would be well born. However, Galton did not merely desire that as many infants as possible be born healthy. His goal was to insure that as large a fraction as possible of each generation be the offspring of what he considered the best "stock". By 1883 Galton had been deeply interested in human heredity for almost 20 years, including the possibility that the vigor of a particular population could be significantly weakened by the higher fecundity of immigrants from "inferior" ethnic groups. Galton feared that the upper classes were having too few children to maintain what he considered their crucially important role in the gene pool of Victorian England. His solution was simple. He exhorted the upper classes to have more children (Forrest, 1974). Galton contemplated a role for the state in encouraging valued citizens to have more children. There is no evidence that he contemplated harnessing a state secret police to limit human reproduction, and he never advocated the wholesale destruction of any ethnic group. Over the next 30 years Galton's idea garnered much interest. Perhaps most famous among its proponents in the United States was President Theodore Roosevelt, who warned that the failure of couples of Anglo-Saxon heritage to have large enough families would lead to "race suicide" (Reilly 1991). During the first half of this century eugenics was trans-political. Adherents included liberals and conservatives, progressives and libertarians. In the early decades of this century the emphasis on encouraging reproduction among those assumed to possess a superior genetic endowment became known as "positive eugenics".

The term immediately suggests a contrasting strategy - negative eugenics - that emerged at about the same time. The goal of negative eugenics has throughout the century been to limit child bearing by "undesirable" individuals, presumably because of a strong likelihood that their children too would be "unfit." During the first quarter of the twentieth century, particularly in the United States, ardent supporters of negative eugenics emerged in many quarters, and by the late 1920s social policies to implement "negative eugenics" were widespread. At

the federal level, in 1924 the United States completed the implementation of an immigration policy (which can be easily traced to the Chinese Exclusion Acts of 1877) that was firmly eugenics. That policy was not significantly altered until 1968. During that period it was substantially more difficult to immigrate to the United States from southern or eastern Europe, Asia or Africa, than if one applied from a nation in northern or western Europe (Reilly 1991).

Most nations have a history of eugenic thought or practice. Some have tried to keep gene pools separate by forbidding legitimate unions between members of different social groups. The caste system in India represents perhaps the largest such “eugenic” social experiment ever, spanning almost 2500 years (Dobzhansky 1973). Anti-miscegenation laws in the United States (which existed from as early as 1630 until 1967) were premised in part on a crude eugenic idea - that interracial marriage produced children of reduced genetic quality (Larson 1995). There is no evidence that a racial caste system had any impact on stratifying the population by ability or other characteristics.

Immigration laws have also been used to attempt to insulate “gene pools”. The United States immigration policy that was erected in the 1920s and dismantled in 1968 favored immigrants from northern and western Europe over all other peoples. It was rationalized during Congressional testimony mainly from self-described eugenics experts who strongly favor the quota system and became the centerpiece of the law (Reilly 1991). The United States never enacted a federal sterilization statute, but about 30 states did, many after the Supreme Court upheld a 1924 Virginia law that permitted state officials to sterilize institutionalized retarded persons whom a physician had deemed likely to become the parents of children with similar defects.

Between 1907 and 1960 at least 60,000 people were sterilized pursuant to U.S. state laws. During the 1930s, the heyday of these programs, there were about 5,000 sterilizations a year, the vast majority performed on young women for most of whom the evidence of mental retardation was poor or non-existent (Reilly 1991). Justice Oliver Wendell Holmes, in supporting the sterilization of Carrie Buck, a white inmate of a Virginia institution for mental retardation, and her daughter born out of wedlock, said that “three generations of imbeciles is enough”. (Carrie and her daughter may not have been retarded at all. It seems that Carrie’s real offence was to conceive a child by the son of the family for whom she worked as a domestic servant.) Geneticists were not active participants in these sterilization programs; with few exceptions, however, neither were they critics.

England never enacted an involuntary sterilization law, nor launched a coercive private effort. In Canada, the Province of Alberta was strongly influenced by sterilization programs in the United States. Alberta had a similar and active program from 1928 until 1960, pursuant to which several thousand people were sterilized (Caufield and Robertson 1996). A class action lawsuit by many of the surviving individuals was recently settled with the government.

Although arguments for maintaining racial purity abound in nineteenth-century German literature, the Nazis were also strongly influenced by events in the United States (Chorover 1974). In 1934 German racial hygiene law was drafted in reliance on a model bill written by the American eugenicist, Harry Hamilton Laughlin (who worked for three decades at the Eugenics Record Office at Cold Spring Harbor. In its first full year of operation the Nazi program dramatically eclipsed activities in the United States, sterilizing more than 80,000 persons without their consent. The much grander scope was achieved because the Nazi law: 1) applied to the entire population (rather than institutionalized persons), 2) created a system of “hereditary health courts” designed exclusively to hear and process petitions for sterilization, and 3) virtually any citizen could propose that a fellow citizen should be sterilized. After the German medical profession was “cleansed” of Jews, German doctors were in general strong proponents of sterilization (Proctor 1988).

Tragically, the sterilization program, which quickly evolved to target and eliminate retarded children, the mentally ill and other groups, was in essence a prototype for the gas chambers (Burleigh 1994). During the early years (1934-38), the Nazi sterilization program was not primarily an attempt to improve the gene pool. It focused on eliminating “useless eaters” - persons who consumed resources without contributing to their production. One exception may have been persons with Huntington disease. It was a stated goal of the Nazis to sterilize as many persons at risk for this disorder as possible. The Nazi sterilization program owed part of its success to the efficiency with which the government maintained patient registries, which made it comparatively easy to locate persons with various disorders.

Often overlooked in discussions of the history of eugenics is that the involuntary sterilization programs so popular in the United States in the 1930s were implemented in many European countries (Adams 1990) and in some other nations around the globe during the same era. In smaller nations, for example, Sweden (which had an active eugenic sterilization program until the 1960s), the impact of the programs was proportionately larger than in the United States.

After World War II (1948), US-occupied Japan passed a Eugenic Protection Law (so entitled) that among other things permitted the sterilization of persons who had even distant (up to fourth degree) relatives with any one of more than a dozen presumably inherited (but not Mendelian) conditions. The list reflected the primitive state of human genetics at that time. The program premised sterilization on consent so it was significantly different from the pre-war law, but it reflected a social bias in favor of reducing the number of births of individuals with disabilities. Japan’s law was repealed in 1996, and replaced by the Mother’s Body Protection Law, which avoids the term “eugenic”, has no list of diseases, and avoids any suggestion of coercion.

The article above was originally drafted to support the work of the ad hoc Eugenic Committee of the American Society of Human Genetics.

For a description of state-coerced eugenics programs in the world today, see our accompanying article, "State-coerced Eugenics in the Postmodern World" in this issue.

Philip R. Reilly and Dorothy C. Wertz

For further reading

Reilly, Philip R. (1991). *The Surgical, Solution: A History of Involuntary Sterilization in the United States*. Johns Hopkins University Press, Baltimore.

Wertz, Dorothy C. (1998) "Eugenics is Alive and Well: A Survey of Genetics Professionals Around the World." *Science in Context* 11 (3/4), special double issue on Eugenic Thought and Practice, ed. R. Falk and D.B. Paul

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professionals around the world. Science in Context 11 (3/4), Special issue on “Eugenic Thought and Practice,” ed. R. Falk and D.B. Paul.

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State-Coerced Eugenics in the Postmodern World

There is little support for state-coerced eugenics in the world today. "Eugenics laws" or directives exist in three countries - Taiwan, China, and Singapore - but these laws have no penalties and apparently are not being enforced.

A brief overview of these laws appears below.

Republic of China (Taiwan)

Eugenic Health Law, July 9, 1984

Physicians shall advise sterilization or abortion if necessary to prevent "genetic, contagious, or mental disease which adversely affects well-being of the offspring."

Persons with genetic diseases or with affected 1st, 2nd, 3rd, or 4th degree relatives may request sterilization or abortion.

NO PENALTY for noncompliance.

No evidence of enforcement. Has aroused no international criticisms about eugenics.

People's Republic of China

Law on Maternal and Infant Health Care, October 27, 1994.

Contains 38 articles, mostly public health measures to improve maternal and child health.

There are four "Eugenic" articles regarding premarital counseling and prenatal diagnosis, which have aroused international concern.

NO PENALTIES FOR NONCOMPLIANCE.

LAW FORBIDS SEX SELECTION.

Some Chinese say the law was mistranslated: “shall” is really “should”, an ethical rather than a legal statement.

NOT ENFORCED. Prenatal diagnosis (amniocentesis) is rare in China, though late ultrasound is used. (There are no time limits on abortions.)

The four articles that have aroused international criticism appear below.

Article 16. If a physician finds that a married couple has a serious genetic disease, the “physician shall (should?) give medical advice” and the couple “shall (should?) take measures in accordance.”

Article 18. The physician “shall (should?) give medical advice for termination of pregnancy” if the fetus has a genetic disease. The woman’s signed consent is required. [Note: Although the abortion is voluntary, Chinese follow the doctor’s advice in most matters.]

Article 20. Couples who have given birth to children with serious defects “shall (should?) be subject to medical examination” in a center above the local level. [Note: This could be interpreted as good medicine, by referral to a more knowledgeable physician.]

Article 10. Physicians shall (should?)...give medical advice after a premarital check-up to couples “with certain genetic disease of a serious nature which is considered inappropriate for childbearing from a medical point of view; the two may be married only if both sides agree to take long-term contraceptive measures or have a ligation operation for sterility.” [Note: the terms “serious” and “inappropriate for childbearing” are not defined in the law and are perhaps undefinable.]

Singapore

Prime Minister’s policy statement, August 1983

The government should:

1. Encourage college graduates to have more children. Some suggested enticements:
 2. a). guaranteed placement of children of eligible couples in elite schools
 3. b). free love-boat cruises for singles
 4. c). free computer-dating service
 5. d). “courtship classes” in college curricula
 6. . These measures were dropped after protests by the educated elite that the measures were patronizing.
2. Discourage high-school dropouts from having children (June 1984): \$4000 payment for being sterilized after 2 or fewer children. There are

no data on whether this program is being carried out.

A fourth country, Japan, had a law openly entitled “Eugenic Protection Act.” This was passed during the U.S. Occupation of Japan under General Douglas MacArthur, and was designed as a public health measure. Like the Nazi sterilization laws, it was based on U.S. state eugenic laws passed in the 1920s and used a similar combination of (presumably) inherited conditions, mental illness, and social/moral conditions as criteria for sterilization. The law focussed on voluntary sterilization, which people could request if they had up to a fourth-degree relative (first cousin, once removed) with one of the listed conditions. However, the law also allowed for some involuntary sterilizations, and some disability rights activists in Japan claim that 275,000 involuntary procedures were performed, mostly in the early years of the law. The law also permitted abortion for couples at risk of having a child with one of the listed conditions, but did not permit abortion for most genetic or chromosomal disorders or congenital malformations. (These abortions were carried out on “social,” not medical or eugenic grounds.)

A brief overview follows:

Japan: Eugenic Protection Law of 1948

Allowed voluntary sterilization or abortion for a list of about 30 hereditary diseases, including epilepsy, schizophrenia, manic-depressive psychosis, abnormal sexual desire, criminal inclination, mental retardation, color blindness, hemophilia, neurofibromatosis, hereditary deafness. People could request sterilization or abortion if they had up to 4th degree relatives with the condition.

The Law allowed for involuntary as well as voluntary sterilization.

Repealed in 1996.

Replaced by the Maternal Protection Law, which does not mention hereditary disease. Mother’s life and health, or rape, are now the only medical conditions for abortion. Abortions of fetuses with genetic conditions are carried out for “social” (usually financial hardship) indications, but are easily obtained.

Dorothy C. Wertz

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Eugenics: Alive and Well in China

One discussion topic at the 9th International Congress of Human Genetics in Rio de Janeiro this August will be the June 2, 1995 Chinese "eugenics law", which is actually entitled "Law on Maternal and Infant Health Care."

The law aims to reduce the number of births of children with disabilities. China has over a fifth of the world's population, about 1.2 billion, of which an estimated 52 million have disabilities. The law requires premarital examinations for serious genetic disorders, for some infectious diseases such as venereal disease and hepatitis B, and for mental illness. If the disorder is sufficiently "serious", tubal ligation or long-acting contraception is required for permission to marry. If childbearing is permitted at all, prenatal diagnosis and termination of affected fetuses are compulsory. It is not clear which disorders are "serious" enough to fall under the law. Editors of *The Lancet*, while rejecting coercion in health care, have pointed out that "it is perilous to impose western morality" on China. They point out that the law will do little to reduce the numbers of people with schizophrenia, for example, and suggest iodine supplements to reduce China's endemic cretinism.

The European Society of Human Genetics, at its May 1995 meeting in Berlin, condemned the Chinese law. So far there has been no concrete response.

For further reading:

The Times (London), June 5, 1995

The Lancet (editorial) Western eyes on China's eugenics law. *Lancet* 346; 1995; 131.

Opinion. China's misconception of eugenics. *Nature* 367; 1994: 1-2.

Dickson D. Concern grows over China's plans to reduce number of "inferior" births. *Nature* 367; 1994: 3.

Next issue: The Human Diversity Project

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Would “Eugenic Programs” Work? A Thought Experiment

Suppose that we want to eliminate a genetic disorder that causes considerable suffering, for example Huntington disease or cystic fibrosis. Could we do this through a planned eugenic program? The answer depends partly on the mode of inheritance of the disorder (dominant or recessive), partly on the frequency of the gene in the population, and partly on whether the program is voluntary or mandatory.

Autosomal Dominant Disorders

Let's start with disorders that have dominant inheritance. Only one copy of the gene (one parent) is required, each child has a 50% chance of inheriting the gene, and possession of the gene inevitably leads to disease, usually after the person has already had offspring who may also have the gene. Huntington disease (HD), which usually manifests itself around age 40 and leads to relentless mental and neurological decline, is a good example. There is no treatment for the underlying condition. HD has few “new mutations” (cases that appear with no family history of the disease), and until a few years ago such new mutations were believed impossible. At least in theory, HD could be eliminated in one generation if everyone who has the gene decided not to have any children. About ten years ago, as scientists zeroed in on finding the Huntington gene, some geneticists actually predicted that HD would be eliminated within a generation. Presumably everyone at risk (about 30,000 families in the U.S.) would be tested to see whether they had the gene, and everyone who had the gene would avoid passing it on to their children, either by having no biological children or using prenatal diagnosis to identify and selectively abort fetuses with the gene. This has not happened. Only a minority of people at risk (about 20%) have asked for testing, and only a handful have used prenatal diagnosis. Most people do not wish to know whether they will develop an incurable disease. Some think that by the time a potential child reaches age 40, a cure may exist. In any case, that child will have had many good years of life.

Clearly, voluntary testing has not worked to eliminate HD. Could we still eliminate it, once and for all, from the population? Yes, but only in a police state with a universal registry of Huntington disease families. A

few countries, including Denmark and Sweden, have universal registers of families with genetic disorders, and others, including the United Kingdom, are developing such registers. (The U.S. has no genetic registers. Usually the best way of locating families - though lists are far from complete - is through patient support groups, which would be unlikely to release their membership lists to eugenic programs.) In addition to a complete register of at-risk families, a eugenic program would need a government with police powers to enforce sterilization (or perhaps long-term contraception such as Norplant) against people's will. All Huntington disease families would be rounded up, tested for the gene, and those with the gene would be forcibly sterilized, thereby effectively eliminating future cases of the disease in that particular country. Most countries in the modern world would never tolerate such an invasion of human rights. The Nazis actually tried such a program, sterilizing or exterminating all members of families on their Huntington disease registers, because it was not then possible to test for the gene. Even Nazi efficiency, however, failed to eliminate Huntington disease from Germany.

Let's assume that you're the scientist-dictator who's nevertheless determined to eliminate autosomal dominant disorders by the police-state forced-sterilization route. Theoretically, this would work for Huntington disease, where there is always a family history. But what about a disorder with a high new mutation rate, such as neurofibromatosis (NF), which causes many problems, including large, disfiguring lumps, often on the head and neck? NF has an estimated new mutation rate of 50%, meaning that systematic sterilization of all persons with the gene, even if carried out for hundreds of years, could reduce the incidence of NF by no more than 50%. Many autosomal dominant disorders have high rates of new mutations. Huntington disease is an exception.

Autosomal Recessive Disorders

Many eugenic programs (including today's laws in China and Taiwan) are based on the proposition that sterilizing all affected people will greatly reduce the incidence of a condition in the next generation and will improve the gene pool. We've already shown that this won't work for most autosomal dominant disorders, because of new mutations. How would it work for autosomal recessive disorders?

Affected people are just the tip of a genetic iceberg. Most people do not know that they are carriers unless they have a child with the disease. Sterilizing affected people will not prevent those who are silent carriers from having affected children. The ratio of carriers to people with a disorder increases as the percent of carriers in the population decreases.

Using a mathematical formula called the Hardy-Weinberg Law, it is possible to calculate exactly what effect a perfectly efficient sterilization program for all affected individuals would have on the frequency of a gene in a population. Most recessive genes are rare. Suppose that 1 in 100 people carries the gene. After one generation of sterilizing all

affected people (but not carriers), 1 in 101 people would carry the gene. After 2 generations of sterilization, 1 in 102 people would carry the gene, and so on. After 100 generations (2500 years) of sterilization, 1 in 200 people would carry the gene. Clearly a negative eugenics plan of sterilization affected people would have no noticeable effect on the numbers of persons born with the disorder. (For more information about these calculations, see Anthony F. Griffiths, Jeffrey H. Miller, David T. Suzuki, Richard C. Lewontin, and William M. Gelbart, *An Introduction to Genetic Analysis*, Fifth Edition, W.H. Freeman Co. 1993, P 760).

Since sterilizing people with the disorder won't work, why not sterilize carriers, (now that we can identify them through genetic tests), or at least forbid them to mate with other carriers of the same disorder? In theory, sterilizing all carriers would work to reduce the incidence of genetic disorders. The problem is that it would drastically reduce the number of people who would be allowed to reproduce. Sterilizing all carriers of sickle cell anemia could reduce the fertile population by 30% in parts of Nigeria. Sterilizing all carriers of cystic fibrosis could reduce the fertile U.S. Caucasian population by 2%. And that's just one disorder. If we could really test everybody for everything, we would all have a gene for at least one, and more likely 7 or 8 debilitating "single-gene" conditions. Not even a dictator wishes to sterilize the entire population. It's impossible to "clean up the gene pool" and continue the human race. We're stuck with our faulty genes.

So why not forget about the gene pool and simply forbid carriers of recessive disorders to mate with each other? A closed community whose members have agreed to live by the rules can do this, as some Orthodox Jewish communities do with the Dor Yeshorim carrier testing program. In most societies, however, couples or their families prefer to make their own decisions about marriage. Coercive marriage programs would lead to popular rebellion.

Multifactorial Conditions

If eugenic programs can't work for single-gene disorders, what about conditions that may be caused by several genes working together, or by a combination of genes and environment? Most of the conditions listed under eugenic laws - past and present - are multifactorial, including mental illness, alcoholism, and social deviance, and even mental retardation. A good example is the 1988 "Regulation Prohibiting Reproduction of Dull-Witted, Idiots, or Blockheads" in Gansu province, China. (This law is not to be confused with the 1994 Maternal and Infant Health Care Law, which is a national law). "Dull-witted, idiots, or blockheads" are defined as having IQ's below 49 or behavioral disorders in memory, language, orientation, or thinking, "congenitally caused by familial inheritance or inbreeding".

The law specifies no particular genetic conditions. Mental retardation at birth may result from a variety of causes, such as maternal disease during pregnancy (rubella, toxoplasmosis), maternal toxic exposure before or during pregnancy, poor maternal nutrition, including

insufficient folic acid, fetal deprivation of oxygen during birth, and , perhaps most important, low birthweight or prematurity. After birth, mental retardation may result from poor infant nutrition, infection (such as meningitis or encephalitis), or child abuse. Genetic factors begin to take precedence only towards the very bottom of the IQ scale, among those profoundly or severely retarded, most of whom are unable to reproduce anyway. Sterilizing everyone with mental retardation does nothing to “improve” the gene pool or to reduce the incidence of mental retardation in succeeding generations.

Voluntary Programs

Clearly, coercive programs cannot work. Some voluntary programs, however, have led to a significant decline in the numbers of children born with certain disorders. In the United States, carrier testing for Tay-Sachs in Jewish communities, followed by use of prenatal diagnosis and selective abortion (or, in some communities that oppose abortion, by avoidance of marriages between carriers) has reduced the incidence at birth from 30 per year to less than 10, most of whom are born to couples with no known Jewish ancestry and no reason to suspect that they might be carriers. In Sardinia, Cyprus, and Cypriot communities in England, premarital carrier testing for beta-thalassemia, followed by prenatal diagnosis and selective abortion (or, in about one-fifth of couples, choice of a mate who is not a carrier), has drastically reduced the birth incidence of the condition. These programs have succeeded on a voluntary basis, with the cooperation of the communities involved. Whether they deserve the label “eugenic” depends on the definition of eugenics used. People who disapprove of these programs, either because they oppose abortion or because they believe prenatal diagnosis discriminates unfairly against fetuses with disabilities, often label these voluntary programs as eugenics and compare them with the Holocaust. People who approve of voluntary programs usually hesitate to use the word eugenics because of its negative connotations, even though the programs have a eugenic outcome in terms of healthy births.

In sum, coercive eugenics programs have failed and will continue to fail to reduce the numbers of persons with inherited disorders. It is difficult to imagine that any social program will ever succeed in changing the gene pool. From a scientific point of view, eugenics laws make no sense. Voluntary programs, however, may succeed if their methods and outcomes are in accord with culture and religion.

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Eugenics: Definitions

To many people, the word “eugenics”, from the Greek for “well born” or “good birth” simply means having a healthy baby. This is what it meant to the American farm families who exhibited themselves and their children in Eugenics Society “healthy family” competitions at country fairs in the 1930s, just as they exhibited their prize cows.

Most people today, however, connect eugenics with the Holocaust, the Nazi extermination of Jews, Gypsies, Slavs, homosexuals, families with Huntington disease, the mentally ill, and other “undesirables.” Calling someone a eugenicist, even if no definition is attached, usually means that his or her policy is “bad”, if not downright evil.

Eugenics and Coercion

How did this pejorative (negative) meaning become attached to eugenics, if the word itself means “good birth”? No one objects to healthy births, but many people would object if they were forced to have children (even healthy children) or were prohibited from having children because their children might not be healthy. Most people today connect the term eugenics with some form of coercion, explicit or implicit. Coercion includes government sterilization laws, such as once existed in the United States, Canada, Brazil, Sweden, Germany and other nations, applied to people with mental retardation, mental illness, alcohol addiction, epilepsy, and antisocial behavior. (For more detail, see [A Brief History of Eugenics](#) in this issue or Philip R. Reilly’s “A Look Back at Eugenics” in our November, 1996 issue.) Other forms of coercion may include inadequate social, financial or educational provisions for people with disabilities, misleading information provided by doctors or public health workers, laws forbidding marriages of certain types of people (e.g., those with mental retardation) or between certain social groups. It is the coercive element in eugenics to which most people object, not the goal of having and raising healthy babies. If families undertook “eugenic” practices voluntarily, including selecting marriage partners to optimize healthy births, being sterilized (or using donor sperm or eggs) if they were at risk of having children who would not be healthy, or using prenatal diagnosis and selective abortion (if consonant with the family’s religious beliefs), probably most people would not only not object, but would laud these families as

responsible parents. Philosopher Philip Kitcher, in his book “The Lives to Come”, (New York: Simon & Schuster, 1996), argues in favor of a voluntary, “laissez-faire eugenics”, in which families make their own decisions about what kinds of children they wish to bear and rear. Kitcher presupposes a “utopia” in which everyone is well educated about genetic disability and excellent support exists for those with disabilities.

The real world, however, has a way to go before this type of “individual eugenics” becomes truly voluntary. In order to make choices between alternatives, people need 1) full and fair information about these alternatives, and 2) adequate social, cultural, and financial support to act on several of the various alternatives. It is not clear that these two conditions are met, even in Western nations with sophisticated genetic counseling and financial supports for people with disabilities. Information provided (or heard) may be pessimistic, the level of social acceptance of some disabilities may be low, and economic supports may not prevent family hardship. Couples’ decisions also rest within a context of social values; they are not totally atomized decisions. Predominant social values in North America are to have few children and to make each one a work of art, though not necessarily “perfect”. These values are similar to modern Chinese values of “well-bearing”, and “well-rearing”, and having small families. In a broad sense, a certain amount of “cultural coercion” will probably always attach to reproductive decisions. What gives eugenics a bad name is a history of government interventions in many nations that forced people to have or not have children, against their will.

Eugenics and Racism

There is another reason why eugenics has earned a bad name. In Western nations, eugenics is inextricably tied up with classism or racism. Fundamentally, eugenics is a statement that “we” (the people making the statement) are better than “they” are. “Better” means morally, physically, intellectually, spiritually, genetically, etc. It includes being more advanced on the evolutionary tree. Therefore, there should be more of “us” and fewer of “them”. U.S. President Theodore Roosevelt expressed this sentiment early in this century, in describing the “race suicide” of the Anglo-Saxon race, who were having too few children and would soon be overwhelmed by the large families of immigrants from southern and eastern Europe (not to mention Asia). The answer was restrictive immigration laws, first the Chinese Exclusion Acts (as early as 1880), followed by the Immigration Restriction Act of 1924, which effectively shut out immigrants from Africa and Asia and gave preference to those from England and northern and western Europe over those from southern and eastern Europe. The Act was intended to try to restore the ethnic composition that had existed in the U.S. prior to 1850.

Another eugenic approach is to exclude “them” from “our” gene pool, even if we can’t exclude “them” from “our” country. Presumably this keeps “our” breeding stock healthy (often the words “clean” and “pure” are used) and avoids “pollution” by “inferior” genes. Anti-miscegenation laws in U.S. southern states forbade legal marriages between whites and persons with as little as 1/16th African-American ancestry. These laws

were declared unconstitutional only in 1967. Hitler's "Blood Protection Laws" (1934) forbade marriages between Aryans (Germans) and persons of Jewish ancestry. In India, culture has forbidden most marriages between people of different castes for 3,000 years. None of these measures has succeeded in preventing mixtures between gene pools or in producing genetically "superior" groups, though they have succeeded in keeping some groups in power.

Eugenics and Classism

Eugenics is sometimes classist instead of racist, but the concept of "us" versus "them" remains. The so-called "eugenic family studies" of the Jukes, the Kallikaks, and "Joe Sixty" (so named for his purported low IQ) were all of poor rural, southern whites, a group that could not be controlled by immigration laws (they had been here since the 1700s), anti-miscegenation laws, or Jim Crow (segregation) laws. The eugenic family studies, conducted by psychologists and social workers (not geneticists) purported to show that many members of this group, often called "white trash", needed sterilization, lest their low IQ's and immoral habits (also thought to be inherited) proliferate and perhaps infect the general population. Most of the approximately 60,000 people compulsorily sterilized in the U.S. between 1907 and 1960 were poor whites. The culture had other ways of keeping African-Americans down.

See the accompanying article on ["Eugenics, Class, and IQ: 'The Bell Curve'"](#).

Is Eugenics Always Racist or Classist?

Is eugenics necessarily based on racism or classism? No. The Chinese claim to have no history of racism connected with eugenics. A eugenics based on individual or family choice, such as envisaged by Philip Kitcher in his book "The Lives to Come", is not racist or classist. However, there remains a distinction between "us" (the healthy, who are making the decisions) and "them" (the not so healthy, who are the objects of our decisions) that some members of the disability community may see as analogous to racism or classism.

"Negative" and "Positive" Eugenics

Often descriptions of eugenics refer to two types: 1) preventing the births of unhealthy (sometimes called "inferior") children, or "negative" eugenics; and 2) producing healthier children ("better babies") than would ordinarily have been born, or "positive" eugenics. Historically, emphasis has been on negative eugenics, because enhancement of human groups has not been a realistic possibility, even with assortative mating between people with "desirable characteristics". New discoveries in genetics could make positive eugenics a reality for the first time. Princeton biologist Lee Silver, in his book, "Recreating Eden," suggests that enhancement through germ-line gene therapy, followed by assortative mating between the enhanced, could lead to superior gene pools (the "Gen-Rich"). If so, this would be the first ever "success" of eugenics at the population level.

Eugenics and Genetics

So far, this discussion has said little about genetics. This is partly because most eugenicists were not- and are not-geneticists. The leaders of eugenic thought in the 19th and 20th centuries were a mixed lot, including socialists and conservatives, philosophers (John Stuart Mill and Bertrand Russell), feminists, birth control crusaders (Margaret Sanger), psychologists, behavioral scientists, politicians, and even playwright George Bernard Shaw. Few were physicians or geneticists, who were mostly concerned with their patients or their research, rather than with improving society. Although eugenic thought undoubtedly influenced some geneticists' predictions (including fairly recent predictions that we would eliminate Huntington disease or cystic fibrosis within a generation, because everybody would want to be tested and nobody would want to take their chances of having a child with the disease), geneticists were NOT influential in developing eugenics-related policies, such as sterilization laws. "Eugenic" policies existing today in China, Taiwan, and Singapore (see ["State Coerced Eugenics in the Postmodern World"](#) in this issue) were developed and promulgated by politicians, not geneticists.

Perhaps it is time for geneticists to become more vocal about eugenics. The American Society of Human Genetics has recently issued a statement on eugenics, condemning all forms of coercion but supporting individual decisions about reproduction. The statement briefly describes the Western history of eugenics and explains some misunderstandings of the 1994 Chinese Maternal and Infant Health Care Act. The ASHG statement appears at <http://www.faseb.org/genetics/ashg/policy/pol-00.htm>.

For further reading see the excellent letter to the editor, ["Do Westerners have a right to criticize Chinese 'eugenics' policy?"](#) by James Bowman in this issue. Our "Resources Online" section has a long list of readings.

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What Eugenics is and is Not: Some Examples

Some claim that birth control is eugenics; others make the same claim for prenatal diagnosis followed by abortion. Usually the word "eugenics" implies something "bad", because it is associated with totalitarianism or Nazi extermination programs. As we point out in "Eugenics: Definitions", the negative connotations arise from a coercive history of government-enforced sterilizations in many Western nations, and also from the racist or classist basis of many public policies. In considering whether something is "eugenic", it helps to keep in mind 1) whether it involves coercion, and 2) whether it distinguishes between "us" (who make the policies) and "them." Birth control or prenatal diagnosis may or may not share these negative characteristics, depending on how they are used. If eugenics is defined as a coercive policy regarding reproduction which aims at improving human genetic qualities, and which is usually in the best interests of one social group at the expense of another, an examination of various health practices suggests that:

1. Birth control, evenly applied to all social groups, is not eugenics, even if it is coercive, as in China's "one-child" policy. There is no intention of changing or improving the human gene pool, and no favoring of one group over others.
2. Birth control, if applied selectively to particular social, ethnic, or social groups, may be eugenic even if promulgated on a voluntary basis. Although a program's intent may be to reduce world population growth generally (a laudable goal) an unspoken belief may be that there are too many of "them" (usually Africans or Asians) and not enough of "us".
3. Offering prenatal diagnosis, if indicated by a woman's age (usually over 35) and family history has become a "standard of medical care" in Western nations. Offering some carrier tests (e.g., Tay-Sachs or sickle cell) to pregnant women if indicated by ethnic background or family history is also a standard of care. This means that doctors who do not offer these tests may be sued if a woman has a child with the disorder in question. An "offer" of prenatal diagnosis does not mean that the woman has to have the test. She may refuse (about 25% in Denmark and California do so), but many pregnant women do what the doctor suggests. If a test indicates a disorder in the fetus, the woman or family should be free to decide whether to carry the pregnancy to term, though decisions are influenced by the

quality of information provided and the level of familial, social, cultural, religious, and financial support available for the various alternatives. Providing pessimistically biased information so that the woman will have an abortion, or suggesting it directly, would be a form of eugenics. So would refusal to provide health insurance for the child, if born, or to provide education or financial support if a nation has the resources. However, if the couple receives and understands full and fair information and the possibility of economic and social support for whatever decision they make, it would be difficult to characterize prenatal diagnosis as eugenics.

4. Prenatal care, maternal nutrition, folic acid supplements for pregnant women to prevent spina bifida, immunizations for rubella, well-baby care, and infant nutrition are all part of health care generally. They are designed to produce healthy babies, but have no coercive element and no “us” versus “them” distinctions (or at least none beyond the generally class-based inequities in health care in the U.S. and many other countries). Therefore they are not “eugenics” according to our definition. “Euphenics” would be a better word. Euphenics means improvement of the phenotype (body), not the underlying genotype (genetic constitution), by biological, not genetic means. The term was coined in 1929 by Russian biologist N.K. Koltsov.
5. Measures to improve the environment (reduce air pollution, avoid toxic exposures) are also part of health care generally and do not involve explicit “us” versus “them” distinctions. “Euthenics” is a better word than eugenics.
6. Newborn screening for inherited disorders that must be treated soon after birth is not eugenics. Again, this is part of regular health care, like giving antibiotics for infection. All 50 states have newborn screening programs, and in 48 testing is required by law, under the principle that the state has the obligation to protect vulnerable citizens (newborns) who cannot protect themselves from irreparable harm.
7. Health protection-disease prevention measures that are legally required are not eugenic as long as they do not compel a pregnant woman or couple into actions that they do not wish to take. Examples are required warnings to pregnant women on alcohol or cigarette labels saying that the contents may cause birth defects; laws limiting toxins in the workplace; laws supporting maternity leaves; requirements for childhood immunizations before entering public schools (to protect the other children); required premarital blood tests for syphilis, as long as the couple is free to marry regardless of infection status.
8. In some countries, notably Sardinia (part of Italy) and Cyprus, premarital blood tests for beta-thalassemia (a blood disorder leading to death in early adolescence unless treated intensively) are widely applied, with the “eugenic” intent of reducing the number of affected children born. Thalassemia treatment is very costly and threatened to bankrupt the entire health care system in both areas, leaving the children to die. Although the intent of the testing programs is eugenic, and in Cyprus the testing is required (by the Greek Orthodox Church, not the government), “unfavorable” test results showing that both partners are carriers does not prevent them from marrying each other (about one-

fifth choose to marry someone else, who is not a carrier, and four-fifths decide to marry each other and use prenatal diagnosis to prevent the births of children with thalassemia). Nobody is legally required to have the tests in order to marry (in Cyprus, a couple could still have a civil wedding, though the Church would refuse to marry them), and nobody is required to have prenatal diagnosis. Most people, desiring to have healthy babies, decide to have the tests.

9. Some Orthodox Jewish communities test prospective marriage partners for carrier status for recessive genetic disorders prevalent in Ashkenazi (Eastern European) Jewish communities, including Canavan disease, cystic fibrosis, Tay-Sachs and Gaucher disease. The testing program is called Dor Yeshorim. In these tightly-knit communities, marriages are arranged by the parents and require the permission of the rabbi. Abortion is forbidden. A prospective couple who are both carriers of Tay-Sachs or another autosomal recessive disorder (meaning that with each pregnancy there is a one-in-four chance that the child will have the disease) are forbidden to marry each other (they are free to marry someone who is not a carrier, with the rabbi's permission). If this type of program were generalized to the entire U.S. population, it would be considered coercive eugenics and would arouse howls of protest. However, in a closed community whose members accept and live by many rules in daily life, including arranged marriages, a requirement for genetic testing may not appear coercive to those involved.
10. Incentives-financial and otherwise-to have or not have children may be "eugenic" if applied differentially to different social or racial groups. For example, some private organizations in the U.S. have offered money to women on welfare to be sterilized. These groups have a right to make such offers under the Constitutional guarantee of freedom of speech. However, the implied statement that "women on welfare should not have more children" inextricably mixes social, health and possibly even "genetic" considerations. Even if the basic intent of these programs is social, they are based on eugenic distinctions between "us" and "them" and the belief that "they", as inferiors, should not reproduce.

Financial incentives to have more children are not eugenic if they are applied equally within a nation. Some countries, including Canada, have offered bonuses to all families for having additional children.

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A Brief History of Eugenics: Prologue

Many websites start with Plato and go on to Darwin. Therefore we have included this prologue. Most historians believe that eugenics really started with Francis Galton, who coined the term in 1883. For a history starting with Galton, see our accompanying article ["Eugenics 1883 to 1970"](#).

Plato's Ideal Republic

Some think that Plato was the first eugenicist, because his ideal "Republic" was an authoritarian meritocracy ruled by philosopher-kings who enjoyed superior health and reasoning power, while those with less grasp of reason filled the lower niches of the hierarchy. The ideal Republic depended on slavery and said little about women, who had a generally low place in ancient Greek society. Plato believed that temperament was inherited. The Republic's rulers ("Guardians") should secretly arrange the matings of desirable couples, and should make sure that men who were exceptionally courageous in war had extra opportunities for sex, so that they would father as many sons as possible. Although Plato might be called a proto-eugenicist for the ruling class, he did not propose to change the breeding stock of the entire population and he had no "science" on which to base assortative mating. There were no attempts to actualize Plato's ideas of "positive eugenics." What the Greeks, like other ancient civilizations, actually did was more along the lines of "negative" eugenics. See "child abandonment" below.

Child Abandonment: From the Classical World to the 19th Century

Greeks, Romans, and medieval Christians all over Europe abandoned their unwanted infants on a large scale. Some historians have suggested that the practice actually increased under Christianity, which opposed abortion. The Church turned a blind eye to the practice for hundreds of years, until St. Olaf of Norway declared in the 11th century that an infant must be baptized before being exposed to the elements.

Usually infants were abandoned because their parents were unable to take care of them or because they were illegitimate and therefore had no place in society. Many were left in public places where the parents

hoped they would be found and raised by others. Infants with visible anomalies, however, were usually left where no one would find them. Large-scale abandonment of infants continued in Europe through the Renaissance and increased during the Industrial Revolution, with the increase in illegitimacy. By that time, large orphanages had been established where infants could be left anonymously. Only the healthiest survived in these institutions, which were sometimes called “angel makers” for the large numbers of children that they sent into the next world. It was not until after the Second World War that Western European nations emptied orphanages and placed most children with families. Abandonment of infants with “birth defects” continues today in Russia, India, China, and many other countries where parents do not have the resources to care for such children. Many die. However, these children are not abandoned primarily for the purpose of preventing them from reproducing. Therefore this ancient practice is not eugenics.

Herbert Spencer

Many 19th century social theorists believed that laissez-faire capitalism was ordained by nature. Chief among them was Herbert Spencer, whose major work (published in 1853) predates Darwin’s “Origin of Species” (1859). Spencer believed that most of the poor were unworthy by nature and that nothing should be done to encourage their survival or the survival of their children. William Graham Sumner, Professor of Sociology at Yale, was one of Spencer’s best-known followers.

Charles Darwin

Darwin’s evolutionary dictum, “survival of the fittest”, was interpreted by many 19th-century social theorists to justify the class structure of society in the late 1800’s. Left to nature (that is, without any supports such as Social Security, welfare, or disability payments), the “fittest” people would end presumably up on top and the “unfit” would end up in the gutter, where they belonged. Like most people, these social theorists (“Social Darwinists”) got Darwin wrong. According to Darwin’s theory of evolution, “fitness” means simply ability to reproduce. It does not mean superior or even average health, intelligence, or longevity. Most people with genetic conditions are reproductively “fit”, unless the condition either 1) kills them before they have a chance to produce an average number of children; 2) prevents them from finding a mate; 3) leads to sterility or physical anomalies that make reproduction impossible; or 4) produces children who are themselves unable to reproduce. People with genes for adult-onset genetic disorders are usually “fit” in Darwin’s reproductive sense. So are the “social deviants” and poor people to whom Social Darwinists most objected.

Reproductive fitness depends on large part on successful adaptation to the environment, as Darwin pointed out. A gray butterfly that blends with a gray twig is more likely than a black butterfly to escape predators and therefore to live long enough to reproduce. The black butterfly would have a reproductive advantage in an environment of black twigs. Neither the gray butterfly nor the black butterfly is inherently “superior.” Survival depends on the environment, not the

inner qualities of the butterfly.

Unlike Darwin, most eugenicists have interpreted “fitness” as health, intelligence, good moral qualities, and, most important, being similar to the eugenicist who is setting the criteria. Darwin’s theory did not establish criteria for superiority and inferiority except in terms of specific (often micro) environments. Darwin actually annoyed most Church leaders by suggesting that humans were not necessarily “superior” and were not the goal and end-point of the entire creation. According to Darwin, we’re here because we happen to best fill a particular niche in the environment. Given a few alterations in past environmental niches (millions of years ago) we could as easily be unipods with suction-cup mouths, such as are found in fossils in Western Canada’s Burgess Shale.

Samuel Butler’s “Erewhon”

In this Victorian (1872) satire on Social Darwinism, good health replaces morality and ill health replaces crime. Having a cold or a sprained ankle is a crime worthy of punishment, while committing murder is not. Erewhon is the eugenicists’ utopia carried to absurdity. Used in many medical sociology sources, the book is a “good read” that leads students to question the meanings of illness and deviance. It is perhaps even more relevant in the age of genetics.

For Further Reading

On Plato:

Alvin W. Gouldner, “Enter Plato: Classical Greece and the Origins of Social Theory” New York: Basic Books, 1965.

On the history of child abandonment:

John Boswell, “The Kindness of Strangers.” New York: Pantheon, 1988.

On Darwin’s Theory:

Stephen Jay Gould, “The Panda’s Thumb,” “Wonderful Life” (the Burgess Shale), or any number of his books that are found in paperback. All of these are highly readable and entertaining.

Daniel Dennett, “Darwin’s Dangerous Idea” (difficult reading).

On Social Darwinism:

Richard Hofstadler, “Social Darwinism in American Thought.” New York: Braziller, 1969.

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FEATURE ARTICLE

Homecooked Eugenics

Is there a way for medical genetics to respect diversity and enable those in need?

By [Paul R. Billings, MD, PhD](#)

Developments in human genetics are helping us understand human variation. As a result, more tests that can detect a predisposition for or the presence of a potentially disabling and severe congenital or childhood anomaly are forthcoming. But disability is not a biological phenomenon and the "severity" of hereditary conditions can have important environmental modifiers. A trip abroad clarified this situation for me a few years ago.

At an international conference in Japan, a Chinese physician presented data showing a nearly one hundred percent fatality rate at one year of age for children born with Trisomy 21 syndrome at a major metropolitan Chinese hospital. The audience voiced allegations of mistreatment and worse. Certainly, neglect of the disabled resulting from state policy, coercive social or cultural conditions, economic hardship or individual choice is difficult to tolerate for many reasons. Our increasing ability to surgically correct many of the formerly fatal congenital anomalies in Trisomy 21 Syndrome is just one.

Later while touring the host country, I was struck by how polite and courteous the people were to me. Many Japanese with whom I had contact wore surgical masks to prevent spreading contagious illnesses. But I noticed no one with a physical disability in a public place. While I had grown up with disabled children in my elementary school classrooms, and veterans with multiple limb amputations could often be seen on my hometown's streets, the lives of similar individuals were clearly different in Japan.

Individuals and families in differing social, economic or cultural circumstances respond to disability differently. Developments in rehabilitation technology and progress in basic biological sciences are

persistently changing the natural history of disabling conditions (some of which are genetic) for those with access to new findings. Inequities in the availability of existing beneficial technology are problematic too. It may be that a measure of a civilized society at the end of the millennium is the appreciation, accommodation and care of individuals with profound disabilities. Acknowledging the happy lives led by some affected individuals and their families - and a commitment to care for those who would benefit from treatment - could gauge our social and economic strength. Genetic research and its resulting technology can play a role in moving us towards this goal.

However, the application of prenatal genetic diagnostic screening and testing methods, coupled with the right to universally available abortion prior to 24 weeks of gestation, can create a dilemma. While ensuring that women or families are not burdened with unwanted pregnancies and children, how do we avoid "homecooked eugenics"? In other words, individuals or couples with limited first hand experience and knowledge may act out of fear or an impossible wish to have a "perfect baby" in terminating most or all pregnancies that by some standard are "defective" or which harbor a fetus with some potential to be disabled -- how do we protect important individual rights and maximize freedom while not making commonplace de facto eugenics?

Public policies have the potential to modify complicated and changing social issues; in these issues (including policies affecting eugenic practices), maintaining a dynamic balance between the wishes of a free majority and the need for protections of a sometimes vulnerable minority is essential. While we can marvel at the increasing simplicity and range of genetic diagnostics, fueled by public and private investment, we must continue to "mainstream" those with special needs and avail ourselves of experiences with their lives firsthand whenever appropriate and possible. Media and educational images, which are often homogenized and sanitized, ought to reflect the diversity of our society including the genetically different. Investments that improve the care of those with genetic disabilities and enhance their life quality should outstrip those in new diagnostic tools. Finally, only by steadfastly protecting privacy rights (the right "to be left alone") and to be free from any coercion by providers, counselors, the state and/or payers, can "choice" in prenatal decision making be truly preserved. Then outcomes can reflect informed views, personal needs and moral precepts rather than eugenic norms or myths of perfectibility. Medial geneticists and genomic scientists among others could play an important role in achieving this essential balance.

Our ability to know the biological information that human DNA imparts to the organism grows with every passing day. It would be a shame if that self-knowledge was associated with less tolerance of genetic diversity and diminished appreciation of the rich lives constructed by many who some might label as disabled. Lessening our social and cultural differences that adversely impact the lives of the disabled may be part of enabling a universally popular genetic medicine.

For more information, see:

Parens E and Asch A. The disability rights critique of prenatal genetic testing: reflections and recommendations. *Hastings Center Report* 1999; 29(5):s1-22.

Billings P, *Geneletter*1(1), February 2000.

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Gene Letter - 18th International Congress of Genetics Statement on Eugenics

Summary Statement of the Workshop on the Science and Ethics of Eugenics

The following statement was made by a group of Chinese and Western geneticists at the 18th International Congress of Genetics, meeting in Beijing, China, August 12, 1998. The statement summarizes recommendations of a special two-day meeting on ethics, held in response to criticisms of the Chinese Maternal and Infant Health Care Law.

1. Countries share many ethical principles based on the will to do good and not harm. These principles can be applied in many different ways.
2. New genetic technology should be used to provide individuals with reliable information on which to base personal reproductive choices, not as a tool of public policy or coercion.
3. Informed choice should be the basis for all genetic counseling and advice on reproductive decisions.
4. Genetic counseling should be for the benefit of the couple and their family: it has minimal effect on the incidence of deleterious alleles in the population.
5. The term "eugenics" is used in so many different ways as to make it no longer suitable for use in scientific literature.
6. In formulating policy on genetic aspects of health, international and interdisciplinary communication should be carried out at all levels.
7. It is the responsibility of policy makers concerned with genetic aspects of human health to seek sound scientific advice.
8. It is the responsibility of geneticists to educate physicians, decision-makers and the general public in genetics and its consequences for health.

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Positive Eugenics Endorsed by President of International Association of Bioethics

Hyakudai Sakamoto of Nihon University, Japan, incoming President of the IAB, provided enthusiastic support for what he called "artificial evolution." When speaking at the recent IAB meetings in San Francisco. Sakamoto explained that in Asia, the "natural" and "artificial" blend into each other, without clear distinctions. "Non-natural and artificial human activities are ultimately included in nature." "Natural" and "artificial" are not contradictory concepts. In Buddhist thought, there is no "invariance" or "eternity"; everything is always changing. The idea of an invariant human identity that persists through all changes in a human being is somewhat foreign to the traditional Asian ethos. Therefore, Sakamoto believes that geneticists should use recombinant DNA technologies for the further evolution of humankind in the interests of human happiness and harmony. When asked whether he meant genetic enhancement, he replied that he meant positive eugenics. Although Dr. Sakamoto, an ethicist, said that most Japanese geneticists do not agree with him about artificial evolution, many of his general statements about Asian bioethics were repeated by other presenters at the conference session on Asian bioethics. Westerners could do well to listen to these voices, and to remember that Western bioethics represents only part of the world.

Dorothy C. Wertz

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FEATURED LINK

Images of American Eugenics

[The Image Archive on the American Eugenics Movement](#) is just one of the interesting and educational programs developed by the [DNA Learning Center](#) of [Cold Spring Harbor Laboratory](#). This site provides students, teachers, scholars, and the interested public with a comprehensive and visually rich monograph of a dark chapter in the history of genetics -- the American Eugenics Movement.

The goal of the eugenics movement was to improve the human species through better breeding. Eugenicists encouraged people with so-called good genetic stock to reproduce and discouraged people who were deemed genetically unfit.

This history is chronicled through more than 1,200 materials, primarily from the Eugenics Record Office at Cold Spring Harbor, which, under the direction of Charles Davenport, was the center of American Eugenics research from 1910-1940. Because the subject matter is portrayed in a frank manner, the site cautions that some of the sentiments of the eugenics movement may be offensive.

This project was funded by a grant from the Ethical, Legal, and Social Implications Program of the National Human Genome Research Institute and is intended to stimulate independent critical thinking about the parallels between eugenics and modern genetics research. Many feel the parallels are pervasive.

Even though the eugenics movement of the early 20th century was embraced at a national level, some feel the use of modern science and technology under the guise of personal choice enforces social prejudice and/or inequalities. To this end, the exhibit is a vivid reminder of the power genetics can have over the general public, and of the important role for ethics in science, particularly as we move into a new era of genetic discovery.

To view the site, a free [Macromedia Flash Player](#) plug-in is required.

by Heather Brown, MS, CGC

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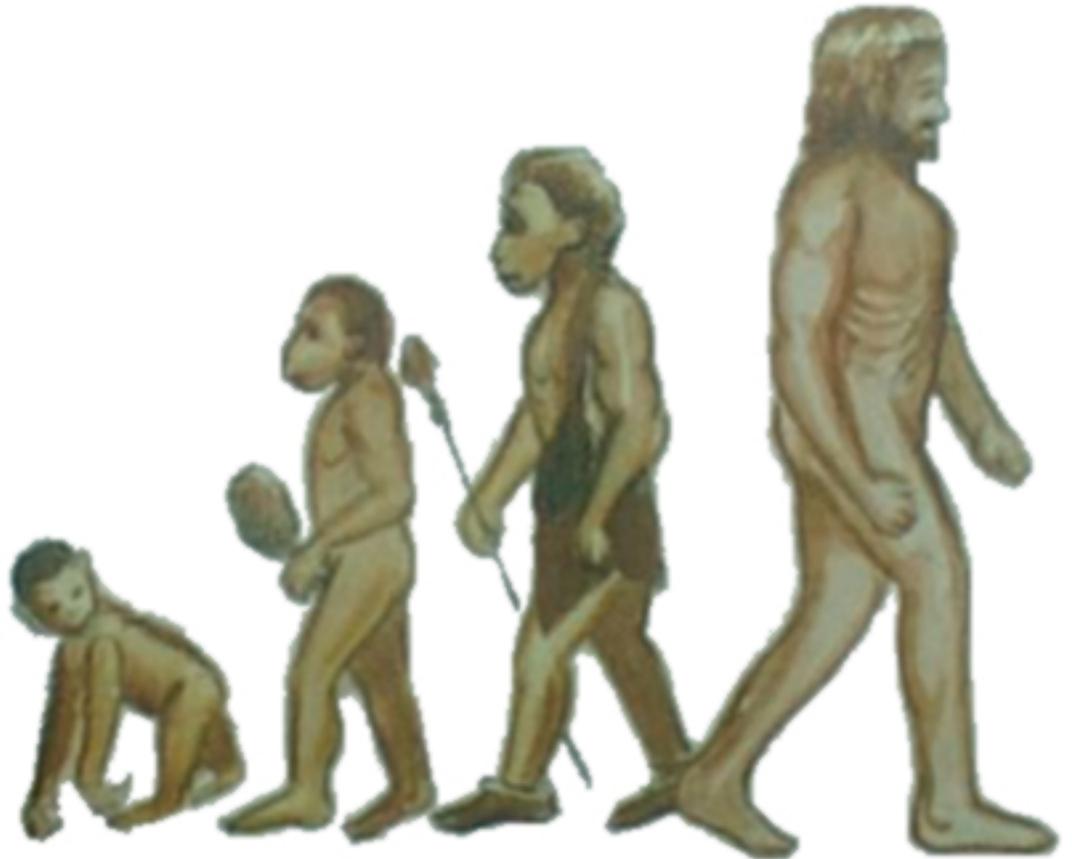
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- I. God
- II. Evolutionary Ethics
- III. Eugenics and Dysgenics
- IV. "Favored Races"
- V. Eugenic Manifesto
- VI. Good & Evil are not Myths
- VII. Superstition is not Religion
- VIII. Religion is not merely Science
- IX. Nihilism and Death are Myths
- X. Born Again
- XI. God is Life

Favored Races



When cosmic energy became life,
a new dimension was added to
the drama of time and space.
For the first time in forever,
there would be pain and pleasure.
For the first time in forever,
there could be hope, faith and love.
Forever would never again be the same.*

Dedicated to
Captain Fitzroy
H.M.S. Beagle

* "The Human Factor" by R. L. Hart

Cover Illustration

Virtually everyone will recognize the cover illustration as representing the evolutionary process whereby the human race acquired the ability to fly to the moon; to build nuclear suns and to control the elemental forces of the universe. Despite our acknowledgement of the biological reality of our nature and origin, we have totally failed to incorporate this reality into our political and religious institutions. Because of this monumental failure, we are now in danger of degenerating back to the level of the subhuman primate once again, just as some of the figures on the cover illustration are walking backwards.

The purpose of this book is to create a religion and a politic that will enable the human race to evolve into and become the next more highly evolved species above mankind. * The uncensored subtitle of Darwin's Origin of Species is "On the origin of species by means of natural selection or the preservation of favored races in the struggle for life." (see chapter IV, page 7)

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The restrictions imposed by the Federal Election Commission do not apply after 2030, as I will no longer be running for office after that time.

I, James Hart, am running for Congress in the 8th Congressional District in the state of Tennessee and I am using this book as campaign literature to solicit contributions. Any reprinting of this book, electronic or otherwise would be considered an in-kind contribution to a political campaign. It is illegal for a foreign national to contribute to an American political campaign. Therefore, it would be illegal for a foreign national to reprint this book and distribute it to others as that would constitute an in-kind contribution to an American political campaign. It would also be illegal for a foreign national to mail this book as the postage he paid for would be an in-kind contribution to an American political campaign. If you receive this book from a mail order distributor which is a foreign national, it will be because I have given him the book free and given him the postage to mail it, just as I hire American mail order distributors to mail for me.

Note: A foreign national who wishes to post this book on the Internet in another language or print this book in another language and distribute it can do it legally if he contacts me and I agree to pay him a reasonable and normal fee to do this. Please don't hesitate to contact me.

It would be legal for an American citizen to reprint this book as long as he did not spend over \$1,000 on printing or mailing, as that is the legal maximum he is allowed to contribute for each election. Also, he must report his name,

address, occupation and employer to the James Hart for Congress Committee so we can collect and submit this information as required by law to the Federal Election Commission. Note: An American citizen who mails this book is making an in kind contribution to a political campaign and must report the amount he spent on postage and his name, address, occupation and place of employment so it can be reported to the Federal Election Commission.

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The cost for this solicitation has been paid for by the James Hart for Congress Committee. Contributions are not tax deductible. Contributions should be made out to James Hart for Congress Committee and sent to P.O. Box 72, New Concord, KY 42076. To comply with federal law, we must use our best efforts to obtain, maintain and submit the name and mailing address of any individual whose contribution exceeds \$50 per calendar year. For those individuals whose contribution exceeds \$200, we must also obtain the person's occupation and name of employer. This information will become part of the public record. If you do not wish your name to become part of the public record, you should contribute less than \$50 in cash per year. Anonymous contributions in cash can not exceed \$50. No contribution in cash can exceed \$100. No contribution from an individual can exceed \$1,000. Any contributions that do not accord with the rules will be returned, if possible. Otherwise, they will be turned over to the government as required by law. Note: It is illegal for a foreign national to contribute to an American political campaign or for one person to make a contribution in the name of another. Note: Any book order will be considered a contribution to the political campaign and the name and address of the person who made a book order in excess of \$50 will be reported to the government as required by law.

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[The Limited Plasticity of Human Intelligence, by Arthur R. Jensen](#)

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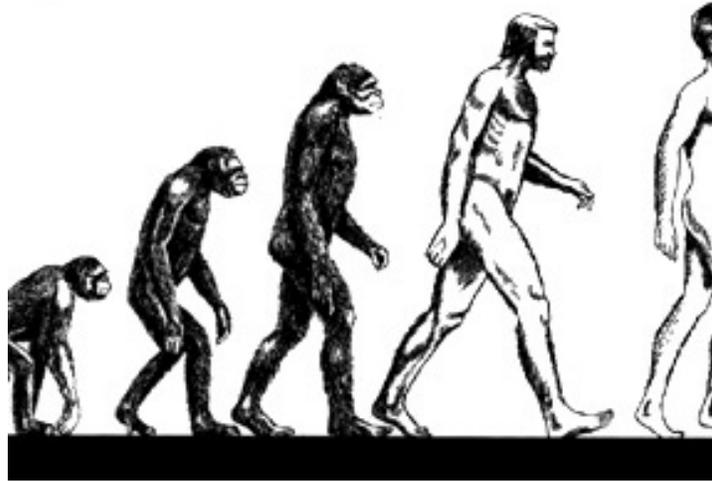
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(End of Eugenics Bulletin articles.)



THE FUTURE OF MAN

by Robert Klark Graham

FROM HUNTED TO HUNTER

FROM HUNTER TO FARMER

FROM FARMER TO FABRICATOR

PRESENT DANGERS

BIOLOGICAL DEGRADATION

BIOLOGICAL EFFECTS OF CLASS WAR

WE ARE THE TARGET

A LOOK BACK

A LOOK AHEAD

DEFICIENT MINDS

RAISING THE INTELLIGENCE LEVEL

THE GREATEST SUCCESS STORY



Robert Klark Graham

1906 -1997

"We would like to express our deep gratitude to the late Robert Klark Graham, without whose support and generosity Future Generations would not be possible."

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The g Factor - *General Intelligence and its Implications* - Christopher BRAND

EDUCATORS! STUDENTS! POLITICIANS!

HERE IS THE BOOK THAT PeeCee DOESN'T WANT YOU TO SEE!

Dernière Mise à Jour : undefined NaN undefined NaN

PLAN DE LA PAGE

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 - En Français
 - In English

VOIR AUSSI :

- **Traduction en français des Outlines des 4 Chapitres et de la Conclusion au Chapitre 4**
- **Review par Philippe Gouillou**
- **English version of this page**

To vote on the book's main educational proposal, 'track choice', and to see how others have voted, just go to:
<http://www.globalideasbank.org/diyfut/DIY-14.HTML>
(In December 2000, the approval level stood at 82%.)

PRESENTATION PAR CHRIS BRAND

ORIGINAL VERSION

In the Spring of 1996, a new book about intelligence and education, THE g FACTOR, created shock waves in Britain by tracing educational failure largely to genetic deficiency in mental speed. The book, by an Edinburgh University academic, appeared after years in which educationalists and the media had played down to vanishing point the importance of inheritance in yielding individual and group differences in attainment. Britain's politically correct academics were aghast to find fast track learning and streaming urged by a psychologist (as it had been by British Labour leader Tony Blair in a major speech in February, 1996). Under pressure from self-styled 'anti-racists', the New York-based academic publishing house, Wiley, unilaterally broke its contract with author Chris Brand by de-publishing the book for 'racism.'

After years of hysterical attacks on hereditarian theorists like Cyril Burt, Hans Eysenck and Arthur Jensen, it is time to show that London School ideas continue to stand and will not be defeated by intimidation, suppression or sacking. Commended by professors of psychology at Cambridge (England) and Austin (Texas), and in a New Scientist editorial, THE g FACTOR is now re-launched in a revised edition (correcting minor errors*) via this page in electronic format. It is

at once a textbook about IQ and a think-piece about what should be done to reverse dumbing-down in education and to help children at *all* intellectual levels. It rejects the tired educational philosophies of both conservatives and leftists and backs a new liberalism that would give children more choice. It is free of charge and may be copied -- though not altered, please.

Chris Brand (cbrand@cycad.com) invites applications from mainstream publishers willing to re-publish his book in paper format, to advertise it and to place it in bookshops. He thanks the Woodhill Foundation, USA, for helping make it possible to gift THE *g* FACTOR to the Internet community.

** The book's political incorrectness, however, remains entirely intact -- so as to show for how little the forces of PeeCee (headed by Wiley, Edinburgh University and the Anti-Nazi League) were prepared to censor an academic work.*

TRADUCTION (sans Garantie)

Au printemps 1996, un nouveau livre sur l'intelligence et l'éducation, *The g Factor*, a provoqué une onde de choc en démontrant qu'une grande partie des problèmes d'éducation de certains enfants provient pour une large part de leur déficience génétique. Le livre, écrit par un enseignant de l'Université d'Edimburgh, venait en contre de tout ce que les médias et de nombreux éducateurs avaient cherché à faire croire depuis des années : le mythe que les différences de réussite entre les individus et les groupes n'ont aucune origine génétique. Les Universités Politically Correct occidentales ont été consternées de voir un chercheur en psychologie recommander la mise en place urgente du Fast Track Learning (éducation accélérée) et du "Streaming", possibilité de suivre des cours de différents niveaux (comme l'avait fait Tony Blair (leader de la gauche Britannique) lors d'un discours important en Février 1996). Sous la pression de lobbies auto-qualifiés "anti-racistes", la maison d'édition WILEY a unilatéralement rompu son contrat avec l'auteur Chris BRAND en retirant le livre pour "racisme", après seulement 6 semaines de publication.

Après les années d'attaques anti-scientifiques (voire hystériques) contre les théoriciens de l'hérédité comme Cyril Burt, Hans Eysenck et Arthur Jensen, il est maintenant temps de rappeler que les idées de "L'Ecole de Londres" n'ont toujours pas été réfutées, ni scientifiquement, ni même par l'intimidation, la censure et les licenciements. Recommandé entre autres par des Professeurs de psychologie de Cambridge (Angleterre), Austin (Texas), par un éditorial du *New Scientist*, ce livre est maintenant ré-édité via cette page en format électronique dans une édition révisée (quelques corrections mineures*). Il est à la fois un livre de cours sur le QI et un livre de réflexion sur ce qui devrait être fait pour stopper la chute du niveau éducatif, et réellement aider *tous* les enfants à réussir, et cela *quels que soient* leurs niveaux intellectuels. Rejetant aussi bien les vieilles philosophies éducatives de gauche et de droite comme dépassées, il propose un nouveau libéralisme qui augmenterait le choix des enfants. Il est proposé ici gratuitement et peut être librement copié - à la condition que ce soit dans son intégralité.

Chris BRAND (cbrand@cycad.com) recherche un nouvel éditeur pour relancer une version papier du livre. Chris BRAND tient à remercier la Fondation WHOODHILL, USA, pour son soutien et son aide qui permettent d'offrir The *g* Factor via Internet.

** Les corrections ne remettent évidemment pas en cause ce qui a été estimé politically uncorrect - ce qui démontre que les forces PeeCee (dans ce cas emmenées par Wiley, l'Université d'Edimburgh et des ligues "anti-nazi") n'ont pas réussi à censurer cet ouvrage académique.*

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- *Il est clair et complet : il présente de manière compréhensible l'état de la recherche*
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- *Il est scientifique : il est argumenté et permet de fonder une discussion sérieuse sur le QI et le Facteur g*

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God

We in the Eugenic movement are not interested in competing against Adolph Hitler or Karl Marx for some minuscule little 1,000 year reich. We are interested in competing with Jesus Christ and Buddha for the destiny of man. Eugenics and evolutionary ethics involves much more than merely the mechanics of selective breeding like we humans were merely a new breed of cattle or a new strain of wheat. Evolutionary ethics is an entirely new understanding of man and his relationship to the universe.

From the beginning of time, man has searched the far reaches of space for another consciousness and another power that could control the destiny of the universe. While we searched in vain to the ends of the universe for an unknown entity, we ourselves have acquired the power to build nuclear suns; to fly through the air like Apollo's chariot; to reach out and touch the stars; the surface of Jupiter; and to probe the depths of the sea: powers that once were ascribed only to God. Could it be that God is not something that was, but rather something that is to be? Could it be that the universe was not the end of creation, but just the beginning? Could it be that we are evolving into and becoming that very God for which we searched?

Could it be that God is not something that was, but rather something that is to be?

When man came into existence, for the first time in forever, the universe could think and feel and see and purpose and direction were born amid the black chaos of space. In us, the universe has evolved into a mind and a conscience and a potential beyond that of a thousand super novas. All the mountains and all the volcanoes and all the suns in the universe are as nothing compared to the life and the consciousness and the brain of man. The most powerful sun in the universe could not even build so much as a table; could not think about itself; could not build a microscope to examine itself; could not build a telescope to examine the universe around it. As the most powerful organizing and directing force in the universe, man is the corporeal manifestation of the universe trying to comprehend and control its own destiny.

Evolutionary Ethics

Perhaps we are at once the purpose of the universe and the means through which that purpose is to be fulfilled. If we are the center and focus and fulcrum of the universe through which everything is seen and understood and done, our value and our moral responsibility

and religious significance are infinite. If we are the mind and soul of the universe trying to comprehend and control its own destiny, our first moral responsibility must be to preserve and improve the human species because if we do not exist, we can not direct the destiny of the universe.

If the human race actually does destroy itself, it is of only academic interest what we died fighting for or against.

The central thesis of evolutionary ethics is that there is no abstract standard by which to judge the value of human life except the quality of that life itself. If the human race actually does destroy itself, it is of only academic interest that we died fighting for or against. Since all abstract standards of value by whatever name: religion, justice, freedom; are merely human qualities and human creations, without human life, they mean nothing at all. Human concepts or inventions are only a manifestation of what we are, and without us, they are no more important than an empty icon, a hollow imitation, a picture of life. The most brilliant physics, the most compassionate religion, the most efficient politics has no more value than a stone tied to a stick compared to the sacred divinity of the race of man that created it. If the human race exists and improves, they can all be created again but without the human race, the universe is an empty void, an empty anarchy without purpose or meaning. Is there any book, any idea, any religion worth more than the existence and improvement of the human race? No! We created all these things. How can they possibly be of more value than we who created them? If we survive and improve ourselves, we can create infinitely greater in the future.

If we are, as evolutionary ethics suggests, the consciousness of the universe that must determine the destiny of the universe, then good is what improves us and evil is what weakens or destroys us. Good and evil are not myths. Good is what

promotes social cooperation toward universal human improvement because that increases man's power, consciousness, control and chances of survival. Evil is putting loyalty to a human construct: nation, religion or politics; above loyalty to preservation and improvement of man because that causes conflict and decreases the chance of survival and advancement. It is not necessary that we all agree to be Christians, atheists or communists. It is only necessary that we recognize the deity that we have in common with all men; the life within our mortal bodies.

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Eugenics and Dysgenics

Man has a tremendous ability to influence the destiny of the universe because of his highly evolved brain. While man's scientific technology is developing by quantum leaps, we are destroying the very intellectual faculty that gave us this capacity just as surely as a pianist would destroy his capacity by cutting off his hand. Every day we are crippling and maiming the children of the future by injecting into them the genes that cause poverty, suffering, starvation, famine, disease, physical and mental retardation causing in effect the degeneration and anti-evolution of the human species. Paradoxically, we have been conditioned to believe that we are doing all this in the name of the highest morality. Indeed, we are told that it is the epitome of compassion, charity, social responsibility and even religious duty to spend time and money maintaining the unfortunate children who are retarded and incapable of taking care of themselves. What of our moral responsibility to protect the right of future generations to be born physically healthy and mentally capable? It is only because of our highly evolved intellectual capacity that we were able to develop the technology to keep these genetically poisoned individuals alive. Ironically, we are using the intellectual capacity that made us great in order to destroy that capacity itself.

The purpose of human action is and should be to increase man's knowledge about and power over the environment. Each year, we spend billions on education and nutrition for our children in order to increase their power to control the environment and thus produce a higher standard of living: Yet, we ignore the most pertinent and significant factor in human power, which is intelligence.

should anyone have the temerity to suggest that these eugenic techniques be used to protect our children, he risks being labeled as a nazi or racist.

The Encyclopedia Britannica acknowledges that at least 75% of the variation in intelligence between individuals is determined genetically and only 25% environmentally. We are ready to blow the world up in a nuclear conflict between Lysenkoist environmental determinist fairy tales like capitalism and communism and 2,000 year old ghost stories that could have been written by Bram Stoker or Mary Shelly, but we are too meek to take any action on a public health issue like eugenics that could directly improve the human condition without war.

Eugenic techniques like gene splitting and selective breeding are considered good when applied to plants and animals to produce advances in medicine and food production, but should anyone have the temerity to suggest that these eugenic techniques be used to protect our children, he risks being labeled as a nazi or racist. One actually hears the argument: eugenics is evil because Hitler believed in eugenics. Is everything that Hitler believed in wrong ipso facto because he believed in it. If Galileo had been a mass murderer, would that prove the world vs flat? Eugenics is a moral commitment, not a racial affiliation.

This schizophrenic attitude toward eugenics is muddled and confused further by the pseudo-intelligentia of sectarian atheists, humanists and socialists who think of themselves as the most liberal and objective free thinkers? Instead of entering into an honest discussion of eugenics, they catechize us with slogans like "we hold these truths to be self evident that all men are created equal." This fanciful slogan is interpreted by egalitarians as a pseudo religious mystical 'divine right of birth'; that is parallel to the medieval concept 'divine right of kings'. In medieval times, a child who happened to be born to a king was thought to endowed with a metaphysical divine right to control the resources of the earth and the destiny of man. In modern times, according to the 'divine right of birth', a person who happened to be conceived and born because of the chance combination of sperm and egg and a thousand other happenstances is thought to be magically endowed with a mystical supernatural right to command the resources of the earth and the destiny of man. Both the 'divine right of kings' and the 'divine right of birth' involve the medieval assumption that those who happen, by chance and coincidence to have been born, have somehow more right to control the resources of the earth than those who did not yet happen to have been born. The 'divine right of birth' has no more validity than the capitalist assumption that those who happen to have been born with wealth have somehow more divine right to use the resources of the earth than those who do no happen to have wealth. The procreation of children is a combination of caprice, opportunism, greed and chance in much the same way that the acquisition of money is. The socialists and sectarian humanists would claim, with some validity, that an economic system is valuable only in so far as it contributes to mankind as a whole. To a much greater extent, this premise should be applied to the birth of each individual human being.

An even more fantastic objection to eugenics comes from superstitious people who base their objection on what they call religious or moral grounds. They claim that if a child is born retarded, it could only be because it was the intention of some all knowing and all powerful entity who wanted the child to be born

retarded. Do we really believe that a child is born because of immaculate conception: because some ghost comes down and picks one sperm out of millions and matches it alone with the egg and determines that the child will be born with downs syndrome, mental retardation, spina bifida, and club foot and that it would be a sin against the ghost for a human being to protect his own children from physical and mental defects? What is the difference between this attitude and that of the Jehovah's Witness or Christian Scientist who refuses medical treatment for his children?

The pattern of present births is the pattern of future populations.

who accepts responsibility for restructuring society in one generation automatically becomes responsible for the effects of that restructuring on future generations. "The pattern of present births is the pattern of future population." Suppose we continue the present policy of encouraging the least capable members of the human race to reproduce by giving them encouragements, welfare grants and rewards for bearing more children? In the end, there would be more people consuming goods than there would be people who had the ability to produce these goods and the very people we were trying to help would starve.

Do we have a right to determine who will be born in the next generation and thus who will control and direct the destiny of man and the universe? We are already doing that through the tax and welfare structure. A person

The existence of man depends on the genetically capable individuals because they are the only ones who can maintain society. If the capable individuals are not born or educated, all the people will starve. In order to prevent human suffering, we must first take care of those who can maintain civilization rather than those who will never be able to contribute. It is irresponsible for any society to adopt a social welfare system as they have today, without adopting a eugenic welfare system in conjunction with it. We must consider the future good of mankind. The premise of working for the greatest good for the greatest number is correct, but we must include in that number all the children who will ever be born in all the days that will ever be not just those who happen to have been conceived and born and who happen to exist at this particular stage in evolution.

Redistribution of life support away from the productive and creative members of the more "favored" socio-biological class to the less "favored" socio-biological class through the tax and welfare structure causes genetic change in the next generation. We as a species will change as a result of this redistribution. Our present welfare system is redistributing life support systems away from the

capable to the incapable and thus reducing the genetic quality of future generations. We are indulging in unnatural selection by giving welfare to non-producers. We are creating a whole generation of parasites and problem makers and preventing the birth of those very people who could solve those problems. It is not a question of beginning or initiating a eugenic program. It is a matter of recognizing that we have already begun an anti-eugenic program which is a suicidal and disastrous one because it selects the inferior for survival and eliminates the superior. We are practicing eugenics in reverse. We are causing the reversal of evolution. Since we are already manipulating genetics, we should be made conscious of our responsibility for the results of our actions on future generations. We are responsible for what our children will be. We can no longer plead ignorance. We have a voluntary choice to make between superior and inferior, between prosperity and starvation, between evolution and devolution. Doing nothing is a choice and a disastrous one. Shall future generations consist of people who are fertile or of people who can contribute to culture and civilization?

Opponents of eugenics claim that man is a tool making animal now and that genetic improvement is no longer necessary. The fact is that the level of civilization that a life form can maintain is a direct result of and is delimited by the intellectual capacity of that organism. Intellectual capacity is genetically determined. Environmentalists claim that man can fly now, but it has not been necessary for man to develop wings through genetic mutation. The sea otter also uses a rock as a tool to open oysters. The twentieth century sciences of earthmen are as paltry as the otter's rock compared to the infinite achievements open to us if we continue genetic as well as cultural evolution. Those who allow man only mechanical innovation while prohibiting eugenic improvement are dooming children of the future to live the life of a rat in a Skinner box. The constant degeneration of the human species caused by the present dysgenic welfare system will result in our children becoming crippled by genetic defects. Is the fate of mankind to become a quadriplegic vegetable hooked up to life support systems from which he can never be released? Because of our timid, careless, irresponsible, neurotic cowardice, we are jeopardizing the very survival of the human species.

If man is responsible for the rain forest, the spotted owl and the snail darter, does he not have at least an equal responsibility for his own children? Eugenics is not cruel. On the contrary, it is the highest expression of concern and love for the children of the future. The suffering in this world is not caused solely by environment but partly by genetics. Thus, the cure for poverty, ignorance, or famine must involve genetic improvement. Poverty, ignorance and starvation can

only be eradicated by removing the genetic and environmental combinations responsible for this human suffering. The cause of our suffering is within us. The source of our salvation is also within us.

*Some ideas in this chapter are from 'Sex vs Civilization' by Elmer Pendell.

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"Favored Races"

The subtitle of Darwin's 'Origin of Species' is "On the origin of species by means of natural selection or the preservation of favored races in the struggle for life."* The human race has evolved to its present state of intelligence and power because of "the preservation of favored races in the struggle for life."*

"On the origin of species by means of natural selection or the preservation of favored races in the struggle for life."*

"Race"* is the central mechanism of evolution that has created all living things. "The preservation of favored races"* is a simple process to understand, but its effects over time are awesome. If we examine the process, we find that at some stage in evolution we can observe a group of individuals of a single species which exists in an area segregated from other members of that same species. As a result of chance mutation, there occur genetic variations in some members of that segregated group. As the generations continue to reproduce, these genetic variations accumulate in the progeny of that segregate group. At first, the accumulated genetic variations do not make the segregate group different enough from the original species to justify calling the segregated group a new species or even a new "favored race"* of the original species. However, after many generations, the segregated group or tribe which had accumulated sufficient genetic differences would be called a new "race"* of the original species. Over time, these newly developed segregated races continue to accumulate genetic differences through chance mutation, variation, etc. The "favored"* variations increase the survivability of the "race"* which carries them. Once this new "favored race"* has become different enough from the original species, it is called a new species. Hence the subtitle, "On the origin of species by means of natural selection or the preservation of favored races in the struggle for life."* There is really no probability that the "races"* would be equal. In fact, the whole notion runs counter to all evolutionary theory and to the whole science of biology.

Given the laws of biology, it would be a great surprise if the average strength or intelligence of one "race"* was found to be exactly equal to the average strength or intelligence of a different "race"*. Despite the controversy surrounding "race"*,

it is not particularly useful to know which "race"* happens, as a result of an accident of evolutionary development, to have greater average strength or greater average intelligence because one could not predict from this average that any particular individual member of one "race"* was going to be superior or inferior to any particular individual member of a different "race"*. There are superior and inferior, strong and weak, intelligent and intelligent individuals in all "races"*. Regardless of "racial"* averages, one would still have to judge each individual on the basis of individual merit without reference to the average of the group to which he happened to belong. Only by judging people as individuals, could we avoid injustice and enable all people to make the maximum contribution to society. There is not such thing as a superior "race"* per se, in the sense that every member of one "race"* is superior to every member of another "race"*. Neither is there such a thing as "racial"* equality in the sense that the average strength or intelligence of one "race"* is equal to the average strength or intelligence of every other "race"*. By judging people as individuals, one could perhaps identify a (superior) socio-biological class which might be a cross section of all "races"* although probably not in equal proportion. The only way you could have a (superior race) would be if a "favored race"* evolved into and became the next more highly evolved species above Homo-Sapiens, in which case it would become a superior species. Eugenics is a moral commitment not a racial affiliation and any "race" that adopted a eugenic program could, given sufficient time, evolve into and become the next more highly evolved species above Homo-Sapiens. It is our hope that all "races" will accept that moral responsibility and accomplish that objective, but it can not be accomplished within the political, philosophical and religious milieu of the 20th century.

*'Origin of Species', Charles Darwin.

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Eugenic Manifesto Political Ramifications of Evolutionary Ethics

Our problems spring not from communist conspiracies, Jewish world plots, Illuminati, blacks, or Bilderbergers, but rather from the very institutions that right wing conservative patriots are trying so desperately to protect and defend. Conservatives would have us believe that we can save our civilization by simply allowing resegregation of the more "favored races"* and less "favored races"* or by returning to the ideas of fundamentalist religion and ancient political dogma like the 'Declaration of Independence'. Actually, we could run our government and our society today with the tenets of the 'Declaration of Independence' and fundamentalist religion just about as easily as we could drive an 18th century carriage to the moon. The statement that "all men are created equal" is enshrined in our heart next to E equals MC² when it should be catalogued next to 'break a mirror and get 7 years bad luck'. Equality is man's most dangerous myth. All men do not have an equal right to life, liberty and the pursuit of happiness. Only the ethical, moral and law abiding have a right to liberty; only the productive and creative have a right to life; and only the wise have a right to the pursuit of happiness.

Democracy is the Ouija board theory of government. If a leading scientist was stumped with a problem and wanted to know the answer to a

Democracy is the Ouija board theory of government.

complicated question of mathematics, chemistry or physics, would he take a poll of the opinions of those on the street? No! Why then would a governmental leader? Are governmental decisions somehow less critical to the progress of man and civilization than scientific ones? Or, do the rabble have some innate sense of social problems that the scientist does not? Suppose you wanted to fly to the moon? Would you take a poll of the people in the street and ask them what components they thought would be necessary to incorporate in a space ship? If we did, what is the probability that we would ever get there? Why should the people in the street know more about politics than they do about aerodynamics? Why then do we ask the man on the street to vote on the components that he thinks are necessary to establish an efficient workable social economic structure? For a politician to

implore all the people to vote however they feel on election day is like asking a monkey to throw sand into the mechanism of Apollo 11 before it takes off. If we are to survive as a species, we must give rule to the few who think rather than to the many who merely fornicate. Numbers and fertility do not imply a divine right to rule.

We recognize that there are some people who should not be permitted to vote and interfere in the decisions that will determine the destiny of man, which is why we prohibit felons from voting. Perhaps we should extend that prohibition to include imbeciles and 10th generation welfare recipients?

Mindless slogans like 'white power' actually make it more difficult for us to understand the real philosophical and political dilemma of the 21st century.

It would be a fatal error to think that our deeply flawed society could be saved by so simple an expedient as the mere segregation or expulsion of some troublesome national or ethnic groups. Mindless slogans like 'white power' actually make it more difficult for us to understand the real philosophical and political

dilemma of the 21st century. No matter what the racial makeup of the population, the tyranny of the lowest socio-biologic class in our lysenkoist democratic political institutions will destroy us because our institutions give power to the most numerous and least capable people who can simply vote the money and power away from the capable and competent working people. If this is allowed to continue, there will eventually be a dysgenic decline in the population until the point is reached when the poor, incompetent low IQ people on welfare of whatever "race"* outnumber the superior socio-biologic class of working people so much that they will no longer be able to maintain society or support the lower class. At that point, riots, mass starvation and famine would reduce the population in an inhumane manner. Only Eugenics, not segregation could prevent this from happening.

The presence of more "favored races"* and less "favored races"* in our society can actually serve as a positive political advantage to the eugenic movement because it destroys the myth of equality and brings into question governments and political institutions based on that myth. The vast difference in the record of historical performance and anatomy between the more "favored races"* and the

less "favored races"* is so dramatic that the real inequality of all men is dramatically demonstrated: The lesson one must draw from this is that if more "favored races"* and the less "favored races"* are innately unequal, might not other groups and classes within the same "race"* also be unequal? If the population were composed of only one "race"*, it might be more difficult to demonstrate the political need to recognize the fact of inequality and to deal with this reality by implementing a eugenic program. If we treat all people as though they were equal, the quality, ability and productivity of each succeeding generation will decline until we reach the point at which we can not maintain civilization at all.

Expulsion of all less "favored races"* from America or Europe would not prevent this collapse; it would merely postpone it. Ironically, the more members of the lower socio-biologic class and the less "favored race"* that immigrate into the U.S. and Europe, the quicker and more dramatic will be the collapse of civilization and therefore the greater the political pressure that could be funneled into the eugenic movement. If a conservative political group like the KKK were to expel the immigrants, that might prevent the rapid building up of the political pressure that would be necessary to bring the eugenic movement to power. This would be a pyrrhic victory because in the end the civilization would still collapse because of dysgenic policy.

Because of the presence of more "favored races"* and less "favored races"* in Europe and America, we have practically a prewritten historical script to force the eugenic movement to power: Because if we continue our present dysgenic immigration and welfare policies, our standard of living and our civilization itself must quickly decline and disappear. Consider the situation in Europe and America today. We have a population composed of a mixture of more "favored races"* and less "favored races"* which are increasingly voting as a block within a political system which dispenses power and resources based on counting the number of votes and at the same time the less "favored races"* are increasing in numbers and political power much faster than the more "favored races"*. It is clear that such a society must theoretically destroy itself when the members of the lower socio-biologic class and the less "favored races"* become so numerous that they can no longer be maintained: But at the same time, they can not be thrown off within the context of a lysenkoist democratic tyranny based on one man one vote. Such a society (a lysenkoist democratic tyranny) must either destroy itself or develop a political system which gives power to people based on ability rather than numbers. Only the eugenic movement can offer such a

formula.

If things continue on their present course, at some point, the more "favored races"* must either surrender their civilization, their standard of living and everything that their ancestors built up over thousands of years or break the political power of the less "favored races"* and lower socio-biologic class. It is not in human psychology to allow this to happen: When people see their civilization and standard of living disappearing, they will be motivated to take action. Only the eugenic movement provides a meaningful, just and practical means through which they can take action to preserve civilization and still treat everyone fairly without regard to "race"*. If the eugenic movement is unable to prevent the coming dysgenic disaster, there are two possibilities for Europe and America. Either the political economic system will collapse and even civilization itself will disappear or else the political system will be taken over by the working people of the superior socio-biologic class of the more "favored race"* by revolution or political activism. Given human nature and the frontier history of the US, the latter course seems much more likely despite the opposition of the media and the apparent quiescence of the middle class today.

In either case, the human race is not saved from dysgenic decline nor does any ultimate benefit accrue to our progeny in the long run. Even if our population were as white as Hitler's behind, our lysenkoist political institutions would still destroy our society. Also there

A eugenic society offers a system by which each individual could be judged on the basis of individual merit.

would be an injustice committed as well as a loss of efficiency if a superior member of a less "favored race"*, (say a scientist) were expelled and a retarded member of a more "favored race"* was retained. A eugenic society offers a system by which each individual could be judged on the basis of individual merit. Obviously, new immigration would have to stop or be restricted to the best individuals. There would be no point to a eugenic society with open borders. If we implemented a universal eugenic program for our whole population, we could avoid racial war and avoid establishing a historical precedent of judging people by their physical appearance.

Racial injustice occurs whenever a person is given something or denied something solely because of his "race"*. Within the context of a political eugenic

movement, more "favored races"* could just insist that they be given equal opportunity for a job or education based on individual merit without reference to birth rate or numerical representation and less "favored races"* could insist that they be judged on the basis of individual merit without reference to the average of the group to which they happen to belong. In arbitrating and adjudicating the competing claims of less "favored races"* and more "favored races"* the eugenic movement could gain a position of political prominence and become a permanent part of the philosophical, political and religious structure of the human race. This could rebound to the benefit of all the children who will ever be born in all the centuries that will ever be because only the eugenic movement could accept the moral responsibility to protect the right of the children of the future to be born physically healthy and mentally capable. Once in power, the eugenic movement could recognize the importance of socio-biologic class and implement a program of affirmative action eugenics that would protect and improve the genetic health of our children so that hundreds of generations from now our children's children might be as highly evolved above us as we are above a monkey.

Our problems are not caused by an identifiable racial, national or political group, but by the very institutions which form the basic framework of our society itself. Even if all blacks, Mexicans, Jews or the entire population of Des Moines Iowa were removed from the United States or Europe, the faulty institutions, religious, philosophical, economic and political that actually caused the problem would still be in place. Mere racism might serve as effective political theater, a tactic to gain political power, but in and of itself, it serves no purpose unless it is combined with a revolution in thought which places evolutionary ethics firmly in power and removes the antiquated fundamentalist notions of religion, politics and economics which are the real cause of our problem.

We have been struggling for a thousand years before the pyramids to have life and labor recognized as the center and focus and the fulcrum of the universe through which every thing is seen and understood and done. Are we going to quit now because a scientist did a statistical study showing that we are not all equal? Is this a surprise?

The old lysenoist myth that the races and classes are equal caused the collapse of the worker's government in Russia and will soon have the same effect in Zimbabwe and South Africa. Clearly, the proletariat is composed of less "favored races" and less favored socio biological classes. It should surprise non one that these worthless bums from the slum couldn't tie their own shoes, let alone run

the government. But to the wrong way corrigans of the right it was an earth shaking revelation that proved to them beyond a shadow of a doubt that the priests, kings and usurers truly did have a divine right to command the resources of the earth and the destiny of man. In their glee that communism was gone and the evil empire kaput, the wrong way corrigans of the right joyfully gave billions to entrepreneurs in Russia, never noticing that they are exactly the same people who wore red stars yesterday.

The status of the workers, which in the lexicon of the third way, means those who maintain the society, hasn't changed a jot. The lysenkoist communists repeat the litany that priests, kings and usurers are parasites on the back of life and labor. The lysenkoist capitalists respond with the mantra that the proletariat is a parasite on the back of the hard working and capable element of the population. And you know, they're both right. Capitalism, communism and fundamentalism are the twin sisters of slavery and oppression. In either case, a small cartel of plutocrats control and direct the destiny of the workers without regard to the best interests of the workers. What difference does it make whether those controlling plutocrats call themselves trilateralists, bilderbergers, the politburo of the supreme soviet, the federal reserve board of the council of nicea?

Ironically, communism is actually higher on the scale of cultural evolution than fundamentalism because the classes described by communism do actually exist, although they are misunderstood, but the ghosts and goblins described by fundamentalism do not exist. Even Dr. Shockley agreed with me on that.

Two hundred years ago, my ancestors fought to free the workers from the tyranny of King George III. The workers laughed when the king held up a crown and sceptre and claimed that these pieces of stone and metal endowed him with the divine right to tax the workers for the sun that shines and the rain that falls. Why do the workers cower today when Rothschild and Rockefeller hold up a dollar and a ruple and claim that these pieces of paper that they inherited when they were born give them the divine right to control the resources of the earth and the destiny of man? Why do the workers cower today when the popes and the ayatollahs hold up a book and claim that they have a divine right to rule because they have an autographed picture of God on their desk?

For a thousand years before the pyramids, we have fought the wars and built the castles and paid the usury to those who claimed the divine right of crowns and sceptres and dollars and ruples and books. What about the divine right of the

workers who dared to trudge across the glacier to find food for their children, the workers who cleared the forests and plowed the fields and built the pyramids? I assure you workers, the only divine right that anyone has is the divine right to work. I promise you workers that if you stop paying tribute to the priests, kings and usurers, the sun will still rise tomorrow and the rain will still fall. And when you plow a field or build a house, it will be for your children. Workers outnumber priests, kings and usurers 10,000 to one. When we clear out minds of their illusions, we can vote anything we want. Tomorrow belongs to us. *'Origin of Species', Charles Darwin.

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Good and Evil are Not Myths

When man came into existence, for the first time in forever, the universe could think and feel and see and purpose and direction were born amid the black chaos of space. In us, the universe has evolved into a mind and a conscience and a potential beyond that of a thousand super novas. As the most powerful organizing and directing force in the universe, man is the corporeal manifestation of the universe trying to comprehend and control its own destiny.

If we are the center and focus and fulcrum of the universe through which everything is seen and understood and done, our value and our moral responsibility and religious significance are infinite. If we are the mind and soul of the universe trying to comprehend and control its own destiny, we must be prepared to accept the sole responsibility for the destiny of the universe and the

If we behave in a 'good' way, we can determine the destiny of the universe. If we behave in an 'evil' way, we will destroy ourselves and the destiny of the universe will be anarchy: black space devoid of life.

fate of our children. This is a moral duty infinitely greater than anything ever imagined by the fundamentalist religions of the past, which failed to recognize man's unique importance to the universe or his ethical responsibility for his own destiny. If man can destroy the human race and thereby destroy the consciousness that must determine the destiny of the universe, man has the power and responsibility that once was ascribed only to God. This brings a higher level of responsibility and opportunity than was ever dreamed of before. By comparison, the fundamentalist religions of the past are profoundly immoral and almost nihilistic. Jesus, Mohammed, et al place so little moral responsibility on man that man's most grievous 'sins', even murder are viewed as simply the mischief of a child, which however foolish or harmful can not even really result in his own destruction because his 'soul' is in the hands of a 'holy ghost' which determines his destiny. But if man is the sole entity that must choose the destiny of the universe: the entity that is responsible for the fate of all mankind, then to kill or injure ourselves or our children would be like killing or injuring God. The

choice between good and evil is then not an abstract ivory tower debate, but the primal choice between death and anarchy or consciousness and Godhood. According to Evolutionary Ethics, we have the same responsibility to maintain our own existence as we had in the past to support the consciousness that controlled the destiny of the universe because now we recognize that we are that consciousness. If we behave in a 'good' way, we can determine the destiny of the universe. If we behave in an 'evil' way, we will destroy ourselves and the destiny of the universe will be anarchy: black space devoid of life.

If we could see our children colonizing other earths a million light years from today, or lying dead and disfigured after a nuclear war, all as a direct result of what we have done today, we would realize the ultimate significance and value of our efforts. If there are no people alive in a million years, it will be because we did something "evil" today. If our children are alive and colonizing other new worlds, it will be because we did what was "good".

The question of the purpose of life and the riddle of 'good' and 'evil' has always been with us. The only difference today is that because of our control of nuclear power and the threat of nuclear self destruction, we must either answer it or die.

Throughout the ages, man has faced and survived all the plagues, ice ages and calamities in the history of the world. Now that he has harnessed the power of the atom and flown to the moon, it seems that nothing in heaven or earth could harm him again. Still, he is on the verge of destruction by his only enemy. Think of the ironic paradox in the nuclear dilemma: (man is now powerful enough to destroy himself). An animal is also powerful enough to destroy himself by jumping off a cliff, but no would anticipate that he would be stupid enough to do it. If some other living or non living thing threatened the existence of man or of his children, man would mobilize all of his energies to destroy it. Yet when man is himself the only real threat to his own existence, he seems stymied to save himself from his own clumsiness, fear and greed.

What good does it do us to have the power to fly to the moon if we use this same ability to destroy ourselves in a nuclear war?

Our physical science has advanced, but our moral science has not. The reason we are on the verge of nuclear suicide is because our scientific advance gave us power, but our failure to advance in a religious moral sense did not give us the ability to control our actions for our own benefit. This exposes us to terrible

We have the moral understanding of an ignorant savage of 2000 years ago, but the science and power of a modern nuclear age.

dangers. We have the moral understanding of an ignorant savage of 2000 years ago, but the science and power of a modern nuclear age. Mankind is like a five year old child playing with a loaded gun.

Yet, even in this preposterous predicament, foolish nihilists tell us that good and evil are myths. Good is what maintains and improves the

consciousness of the universe. Evil is what destroys that consciousness. Nothing can destroy that consciousness but itself. We determine by our actions today all that we can ever do tomorrow. Although we can never know what glorious achievements are in store for our children we do know that by our actions today, we determine whether anything will happen tomorrow or for all the tomorrows that are ever to be. If we do not help our children during our lives, they will never exist.

What is the evil that pulls us toward self destruction? Why do we kill? Jews are killing Arabs. Protestants are killing Catholics. Communists are threatening to kill Capitalists. Do men need such totally different environments to sustain life that they must fight against one another because of these different needs? Do we need different air to breathe, different food to eat, different temperatures, pressures or climates to survive? Could any biologist discover a difference between these groups? If the differences between men are imagined, then the reasons for human conflict are also imagined.

Is it truly moral to be patriotic and fight for God and country? If it is moral for you to fight for God and country, then isn't it just as moral for the guy on the other side to fight for his? Do you think it is good to kill women and children in Moscow, but evil to kill them in Des Moines? If the people in Moscow think the same thing about your children in Des Moines, then mankind will not survive and he won't deserve to.

The old practice of dividing the world up into good guys and bad guys, (us and them) may be all right for late night cowboy movies, but it is hardly suitable in the nuclear age. The major problems in the world are not amenable to political or military solutions. We already have enough power to kill everyone ten times over.

This power has not saved us in the past and merely increasing it will not save us in the future. We need a moral system explaining good and evil not a political or military system to kill women and children in Moscow or in Des Moines.

Man will either destroy himself, or he will gain dominion over the universe. The evil which threatens the survival of man is not a particular ideology like capitalism or communism. Evil existed long before these ideas came into being and evil will still exist when these ideas are as dead and long forgotten as Isis and Amon Ra. Evil is putting loyalty to nation or to a religion above loyalty to mankind. Choosing up sides in a meaningless gang war between communists and capitalists or Jews and Christians has no more significance ultimately in the biological and historical context than a skirmish in L.A. between the Cripts and the Bloods. Sooner or later, this meaningless quarreling must end in the nuclear or biological germ warfare that may destroy the human race. The choice between good and evil is a choice that we make in every human relationship. If we look for a person to blame for past wrongs, we will always find an enemy to fight against. If we look for a person to work together with for future endeavor, we will always find an ally to cooperate with. Evil is the willingness to fight. Goodness is the willingness to cooperate. Thus will be determined the survival of man.

The ultimate human action is not war and conflict, but the exact opposite, cooperation and agreement; because that is what leads to power and power is what has made man the ultimate creation. Man's viability as a challenging life form competing for dominion in the universe depends on his

One man alone would still be hiding in the trees of the jungle. Together we have subdued the earth, plumbed the seas and flown to the moon.

working with other men on a common purpose. The probability of a human surviving as a lone individual is fairly small. As a lone individual, man is less equipped for survival than many other animals. In many ways, man's ability to survive as a lone individual is even less than that of a praying mantis. One man alone would still be hiding in the trees of the jungle. Together we have subdued the earth, plumbed the seas and flown to the moon.

All significant human effort must be social. No one man can build a house, a car, or a space ship. Only agreement and cooperation can produce these things. Cities which are never built or children who are never born will hardly have any effect

on the future.

It does not matter what men disagree on because that will never happen. The only thing that matters is what men agree on because only that will be accomplished.

One man alone could not even create a modern pencil. Together we can conquer the stars.

...you can not maintain human existence without social cooperation and you can not have social cooperation without upholding principles of good and evil. Therefore, you can not maintain human existence without upholding principles of good and evil.

It seems clear than human cooperation is necessary for human survival just as it is for the survival of the ant or any other social animal. Could social cooperation exist in any society that did not uphold universal cross cultural beliefs such as thou shalt not kill or thou shalt not steal? It is simply a fact that social cooperation could not exist without these moral principles being observed by the people in society. And it is simply a fact that mankind could not exist without society. It seems clear that you can not

maintain human existence without social cooperation and you can not have social cooperation without upholding principles of good and evil. Therefore, you can not maintain human existence without upholding principles of good and evil.

Therefore, good and evil are not myths. On the contrary, there are basic inviolable principles of good and evil and right and wrong which apply to all men for all time. In fact, these principles do not apply only to men, but to many life forms. Instinctive moral systems occur in the behavior patterns of most social animals, such as the ant. If the ant violated the immemorial laws which must direct his cooperative instinct, the ant species would cease to exist. It seems pain that if the homo sapien violates the biological laws which must direct his cooperative instinct the human race will also cease to exist. The inescapable conclusion is that good and evil are not myths: they are biological laws which are

no more arbitrary than any of the laws of mathematics or chemistry.

Morality is necessary for social cooperation. Social cooperation is necessary for survival. Therefore, morality is necessary for survival. Good then is what promotes social and international cooperation and evil is what destroys that cooperation because that decreases man's chances of survival.

Good and evil are not myths, although many myths have been written about them. They are a prerequisite for human survival. Morality is not some superstitious fairy tale: it is the mathematics of survival. Good is cooperation and leads to power, life and the stars. Evil is quarreling and leads to war, weakness, death and a nuclear holocaust.

Any race, tribe or nation which violates the mathematics of survival by killing or stealing from one another will cease to exist just as surely as a moon mission based on the formula $2 + 2 = 5$ will fail. It is a sin to say that $2 + 2 = 5$ because that is scientifically inaccurate and will cause failure. It is a sin to kill or steal because that is scientifically inaccurate and will cause the failure of the tribe or race that practices that formula.

Whenever I read Darwin, I get the impression that he has forgotten something; that he has made a potentially fatal, philosophical error or omission. Is not human survival equally as dependent on ethical human cooperation as it is on human intelligence? The universal cross cultural pattern of ethical, cooperative human behavior—Thou shalt not kill, Thou shalt not steal—evolved right along with human intelligence and we would and will be extinct as the dinosaurs without it.

Who said man is beyond Good & Evil? Nietzsche or Al Capone? On the contrary, man's very survival is more dependent on our ethics than on our technological widgets whether hammers or nuclear power. Without ethics, our stone age spears and nuclear widgets will destroy us. Technology is merely an outgrowth of and is totally dependent on the prerequisite of ethical human cooperation. A house, a car, or a spaceship requires ethical human cooperation to produce. Therefore, a house or a spaceship is an ethical, moral and religious statement just as much as it is a technological statement. A society can die from unethical behavior. The task of a journalist, historian, judge or psychologist is not less important than that of a scientist searching for a cure for aids. Human survival depends on ethical human cooperation and we are dying because our leaders have failed to

recognize that fact.

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Superstition is Not Religion

Our present nuclear dilemma is an indication of the failure of fundamentalist religions to provide us with an explanation of good and evil which will enable us to preserve the human race. The human species is like a herd of lemmings headed for a suicidal Armageddon while superstitious people hasten us on by praying for the end of the world, for the 'rapture' or for 'class war'.

It is startling for most people to realize but fundamentalist religions make no claim that they will preserve the biological existence of the human race. On the contrary, they actually pray for the 'day of judgment' when the majority of the human race will be exterminated. How could a world view which prays for the extermination of the human race possibly be a good basis for a moral system intended to preserve the human race.

Are fundamentalist religions ethical guides for human survival or dangerous superstitions that will lead to our destruction? Have fundamentalist religions promoted peace and cooperation between Moslems, Jews and Christians or did they actually instigate the Inquisition, the Crusades, the Thirty Years War and cause the senseless murder of thousands of innocent children.

Are fundamentalist religions ethical guides for human survival or dangerous superstitions that will lead to our destruction?

Ironically, a true religion would not have to use force or threats because a true religion like a true science is simply a true description of man's relationship and responsibility to the universe and would help any man who followed it. It would be ridiculous to suggest that you would have to force someone to do something that is for his own benefit. Only a false religion, (a superstition), would have to resort to force or threats. You would not have to force people to accept a true religion any more than you would have to force them to drive cars rather than horse drawn carriages.

Paradoxically, the use of force in a religious war is actually an indication of a lack of faith not an assertion of it. Because if a person truly believed that an all powerful 'holy ghost' was controlling everything and the fate of the universe was not alterable by nor dependent upon man, the true believer would never bother to use force, especially if he thought the all powerful 'holy ghost' had ordered him to turn the other cheek. Wars fought over things, like fundamentalist religion, which people don't really believe in anyway, are the height, the epitome of human folly. Can you imagine the absurdity of the human race being exterminated in a conflict over something they don't really believe in anyway?

If the human race actually does destroy itself, it is of only academic interest what we died fighting for or against. Since all abstract standards of value by whatever name religion, justice, freedom; are merely human qualities and human creations, without human life, they mean nothing at all. Human concepts or inventions are only a manifestation of what we are, and without us, they are no more important than an empty icon, a hollow imitation, a picture of life. The most brilliant physics, the most compassionate religion, the most efficient politics has no more value than a stone tied to a stick compared to the sacred divinity of the race of man that created it. If the human race exists and improves, they can all be created again but without the human race, the universe is an empty void, an empty anarchy without purpose or meaning. Is there any book, any idea, any religion that is worth more than the existence and improvement of the human race? No! We created all these things. How can they possibly be of more value than we who created them?

It is not necessary that we all agree to be Christians, atheists or communists. It is only necessary that we recognize the deity that we have in common with all men; the life within our mortal bodies.

Our physical science has advanced, but our moral science has not. The reason we are on the verge of nuclear suicide is because our scientific advance gave us power, but our failure to advance in a religious moral sense did not give us the ability to control our actions for our own benefit. This exposes us to terrible dangers. We have the science and power of a modern nuclear age but the moral understanding of an ignorant savage of 2000 years ago. Mankind is like a five year old child playing with a loaded gun.

Perhaps in light of our present situation, we should seriously reexamine fundamentalist religion to see if it is actually a religion at all or is it rather

superstition? If it is superstition, it is a threat to our survival, rather than an aid in securing it.

Religion like science, is merely man's attempt to understand the world around him, and to manipulate phenomena in the environment for his own benefit. Obviously a religion or a science that was not true would not help him gain control over his surroundings. Anything that interfered with human understanding would reduce our ability to control the environment and ultimately reduce the probability of human survival.

Superstition is not religion anymore than darkness is light. "Superstition is a belief or practice resulting from ignorance and a false conception of causation"* Religion is an understanding of man's relationship to the universe. Superstition is the exact opposite of religion because it interferes with that understanding. Superstition far from being a good thing that helps man, is actually an evil thing that harms mankind.

If the Fundamentalist Biblical account of original sin and Adam and Eve a viable basis for an ethical code that explains good and evil in such a way as to promote human cooperation and survival? Consider the following dialogue from my book, ['Socrates Meets Jesus'](#)

Socrates:

If God is all powerful, why did he allow Satan to come to the garden and tempt Eve? If God did not want him to eat the fruit, why did he put the tree in the garden in the first place? If God did not want man to make sexual love, why did he equip man with the organs necessary for it? If God did not want man to commit the original sin, why did he give man a desire for knowledge, experience, adventure and carnal love?

Jesus:

God put the tree in the garden and allowed Satan to come there because he wanted to test mankind.

Socrates:

But God created everything that went into this combination, situation or environment. When he created each of the elements or ingredients in the situation, he know exactly how each would react with the others in any circumstance; because he was all knowing. He intended for each element to be

exactly as it was because he was all powerful and could not make a mistake. It is as though a scientist or physician combined several ingredients into a medicine, which although harmless in themselves, when combined, become a deadly poison; and then after administering it to a patient, disavowed any responsibility for his death. In just this way, God combined many things; an innocent man, a tree of knowledge, a beautiful garden and an angle. It is absurd for God to punish man after creating him. It is as though Homer wrote an ode about a pig and then whipped and lashed the pages or cast them on an eternal unconsuming fire, because he disliked the qualities of the animal. Or that a master sculptor made a perfect statue of a pig and then lashed it for all eternity because he disliked the traits of the animal.

If the doctrine of original sin is false, so is salvation. Turning the other cheek or giving all you have to the poor may not be the God given ethical code that fundamentalist repute it to be. Turning the other cheek would allow criminals to prevail and giving all you have to the poor would encourage the least capable members of the human race to have more children. In fact, following Jesus Christ's admonitions would create exactly the kind of lysenkoist democratic tyranny and dysgenic disaster that we see in our inner cities today. Ask yourself this question: Would less 'favored races' or less 'favored' socio-biologic classes be any threat to the human family if we had a religion based on evolutionary ethics rather than on Jesus?

Dysgenic suicide and nuclear suicide are only possible in a society that refuses to accept the moral responsibility for its actions. Now the imminent prospect of our dysgenic decline, and extinction under the lysenkoist democratic tyrannies marvelously concentrates the mind and forces us to accept our moral responsibility for our own destiny. The imminent prospect of nuclear self destruction doesn't leave us another 2000 years to wait for Godot. Having acquired the technological and scientific power of a God, we must accept the moral responsibility of a God that goes with that power.

We must finally accept the moral responsibility for our own destiny & recognize that we are the consciousness of the universe; that we are the focus and fulcrum and center of the universe through which everything is seen & understood & done: That we are indeed God in the process of evolving into existence.

If man is responsible for the destiny of man and the universe, then the purpose of human action should be to increase man's knowledge about and power over the

universe. That means avoiding superstition especially when it masquerades as fundamentalist religion.

Has fundamentalist religion increased the probability of human survival by expanding man's understanding of and control over the universe around him or has it obstructed it? An honest examination shows that the history of fundamentalist religion has been one continued centuries long scopes monkey trial. In astronomy, medicine, and biology, fundamentalist religion has been the single greatest obstacle to advancement. Fundamentalist religion is guilty of crimes against humanity because by obstructing the advancement of knowledge fundamentalist religion has actually jeopardized the health, the well being and the very survival of the human race.

For a thousand years, doctors were prevented from examining the human body to determine the source and the cure of disease because fundamentalist religionists believed that the examination and dissection of the human body was blasphemous.

For a thousand years, doctors were prevented from examining the human body to determine the source and the cure of disease because fundamentalist religionists believed that the examination and dissection of the human body was blasphemous. How many millions of innocent people suffered and died in agony because of that? In fact, countless millions of people would still die horrible deaths today except that some courageous scientists risked their lives and dissected and

examined the human body in spite of the threats of fundamentalist religionists. These courageous scientists thereby found cures for much of the suffering and disease that afflicted the human race. Imagine the irony when sick people today turn to fundamental religionists for help. If not for the delays and obstacles put in the way of scientists and doctors in the past by these same fundamental religionists, the disease they suffer from might well have been cured centuries ago.

Fundamental religionists have not merely jeopardized the health, well being and the survival of a few individuals, but of the whole human race. Let it be noted that

as long as a man is confined to the earth, we are subject as other life forms are to the periodic extinctions that have occurred in biological history. This all changed when man landed on the moon because this proved that man has the potential ability to colonize other planets and thereby to exist forever independent of the solar system in which he was born. This was the greatest achievement in the history of man because for the first time in history we have the potential of immortality. Even if the earth itself is destroyed, our children may continue to exist forever on another planet. This immortality: the greatest achievement in the history of man was obstructed and almost prevented by fundamental religionists.

Let us never forget that the courageous scientists Galileo and Bruno, who made the moon mission possible and thereby gave man the potential of immortality, were respectively tortured and burned alive by the fundamental religionists

Imagine the height of irony when the astronauts read from the Bible when they landed on the moon. The very people who had compiled the knowledge necessary for them to get there had been tortured and burned

Imagine the height of irony when the astronauts read from the Bible when they landed on the moon.

alive by fundamental religionists because of that very book. If the astronauts had died on the mission to the moon, the blame would be on fundamental religionists for retarding and obstructing the collection of knowledge necessary to make their mission a success.

Imagine the ingratitude to Bruno, who gave his very life so that the astronauts might live. Remarkably, the astronauts revered the Bible which would have destroyed them, and which did destroy their savior, Bruno. If they wish to revere those who had truly served mankind, they should worship the astronomer Bruno, the true messiah, if there ever was one, for in fact, he gave his life to improve human knowledge and in fact, gave his life to save the lives of the astronauts and to potentially give immortality to all the children of tomorrow.

In effect then, Bruno is a shining example and fitting symbol of all courageous scientists throughout history who gave their lives in their commitment to giving knowledge, ability and immortality to all the children of tomorrow.

The instance of the astronauts reading from the Bible is a prime example of how

physical science has advanced while moral science has not. This is precisely the reason we are threatened with nuclear self destruction today: because our scientific advance gave us power in the physical universe, but our failure to advance in a religious moral sense did not give us the ability to control our actions for our own benefit. This exposes us to terrible dangers. We have the moral understanding of an ignorant savage of 2000 years ago, but the science and power of a modern nuclear age. Because of fundamentalist religion, mankind is like a 5 year old child playing with a loaded gun.

Today, all of mankind stands figuratively in the same position as the astronauts. The astronauts were in dire jeopardy when they were floating in space and we are in dire jeopardy in the nuclear dilemma yet we both revere the Bible even while its fundamentalist proponents have prayed and worked for our destruction. If the human race is destroyed, the blame will be on fundamentalist religion which blinded us and prevented us from developing a modern moral system that could save the human race, just as 400 years ago it prevented man from gaining knowledge of the true astronomical relationship between earth and the sun. Bruno's honest astronomy saved the astronauts and only and honest morality can save the human race. Remember, good and evil are not myths, but biological laws which are prerequisites for human survival.

It is impossible for man to survive in the world or on a space mission if he bases his beliefs and actions on falsehood. If you can fly to the moon on the basis of biblical Ptolemaic astronomy, you can run the earth by 2,000 year old morality. An impartial extraterrestrial looking down on this planet would view the continuation of 2,000 year old morality in modern society as an absolutely extraordinary anachronism. Man's moral system is literally 2,000 years old. Have we learned nothing new in 2,000 years? Imagine what our world would be like today if our knowledge of chemistry, medicine and physics had stopped advancing 2,000 years ago. Our physical science, which explains the nature of the physical universe around us continues to advance, but religion, which explains something much more important, our own relationship to the universe itself and our relationship and responsibility to one another stopped advancing 2,000 years ago. What good does it do us to have enough understanding of the physical laws of the universe so that we can stack bricks to make a mile high sky scraper or go to the moon if we use this same science to destroy ourselves in a nuclear war?

A true religion is not superstition any more than darkness is light. A true religion is a tool to help man understand and direct his relationship and responsibility to the universe around him. If we examine our experience in physical science, we

find clearly that our first advances in the realm of physical science were merely crudely sharpened stones, axes and spears. It is hardly surprising that our first moral or religious systems were inefficient. In a figurative metaphorical sense, our 2,000 year old moral systems are like crudely sharpened stones. But that does not mean that we should abandon all moral or religious ideas any more than we abandoned all tools because our first axes and spears were inefficient.

The attempt of the atheists to destroy religion is ridiculous. They assume that religion and superstition are synonymous. They are actually opposites. They likewise assume that religion and science are opposites. Actually, religion and science are strikingly similar because they are both attempts however imperfect to help man understand the world around him.

We should not think in terms of destroying a false religion, but rather of creating a true one.

*Webster's New Collegiate Dictionary

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Religion is not Merely Science

Religion, like science, is man's attempt to understand the universe around him. But, is religion merely science? Is the purpose of life merely the acquisition of knowledge?

Does man exist merely to serve science or does science exist merely to serve man? If science is, in the final analysis only a tool; only an elaborate hammer created by man, how can we make man the servant of that hammer? How can science be preeminent over man any more than a plow or a hammer can? From the point of view of evolutionary ethics, even the most brilliant physics in the world is ultimately of no more value than a stone tied to a stick compared to the sacred divinity of the race of man that created it.

Does man exist merely to serve science or does science exist merely to serve man?

Our prime directive and the purpose of life must be to maintain and improve the consciousness of the universe. Scientific knowledge will be ever increasing as a direct result of that.

Science is a tool created by man and is less than man. How can a tool, regardless of how elaborate, possibly be greater than the life that created it?

It would be the height of folly for a man to become so fascinated and enamored of a tool which he himself had created as to be prompted to sacrifice his own life or dignity to it. There can be no greater error and no greater evil than that of placing man beneath science. Man is the most sacred divine creature in all the universe and all the things are to serve him. Science is not God; life is.

To place knowledge or science above life is to deify science. The deification of science is atheism. Some atheists would deny this, but if they did not believe in anything beyond pragmatic worldly convenience, why would they bother to be atheists? By denying God, they demonstrate greater allegiance to the incorporeal and other worldly values of science than to the worldly comfort, which they could better acquire by acquiescing to believe whatever the crowd believes.

However, atheism does not fulfill the purpose of religion by describing man's relationship to the universe. Even if there were no God, how does it help us to have that information? They do not tell us what the human condition is, but rather what it is not. It does not matter what is false. It only matters what is true. Can knowing what is not true provide our children with food or prevent wars?

Atheism does not provide us with the mathematics of survival, (knowledge of good and evil) any more than superstition did. In fact, it is the antithesis of this religious ethics because it denies that absolute moral responsibilities exist. To accept science as synonymous with religion is to make atheism essentially our religion. Then we have the paradoxical situation in which he who denies that man has any absolute responsibility to the universe is the very man defining and explaining what that responsibility is. The atheist assertions that there is no absolute morality is just as dangerous as the fundamentalist assertion of false morality.

It is clear that morality is a biological law and that the acceptance of moral responsibility is necessary for human existence. By denying that man has an absolute moral responsibility to the universe, atheists are denying that man has an absolute moral responsibility to maintain his own existence.

Superstition and atheism both reduce the probability of human survival by denying or confusing ethical priorities and moral responsibilities. They both demean the human race by saying that man is merely a humble insignificant little creature; just a meaningless, mechanistic automaton; or an ignorant sinful worm. Perhaps this is the inevitable result of placing either science or superstition above life.

Atheism would leave us with the idea that all of life is merely a tyranny of the caprice of time and chance in which we are tossed helplessly about in the meaningless maelstrom of our animal passions.

Does man behave as if he was guided purely by selfish personal caprice or does he behave as if there were some all transcending meaning beyond his own personal existence? Perhaps the purpose of man's existence is to continue his existence. Or as Aristotle said it, 'Man's purpose is his nature.' Man becomes what he does, and man's purpose is what he acts it out to be.

Is man really a depraved sinner as the fundamentalist religionists say or a selfish biologically compulsive automaton as the nihilists would have it? Look at the real world and you see that real human behavior can not be explained in these terms.

If men are selfish mechanistic robots, what motivated scientists like Bruno and Galileo to suffer and even to give their lives for us? If they were selfish biological automaton, why were they willing to give their lives in their efforts to increase human knowledge and to better the human condition? With their ability, they could have lived rich comfortable lives if they had kept quiet; although our lives today would be much harder if they had. It was not selfishness or avarice that caused parents to care for their children or scientists to give their lives for mankind. On the contrary, they had everything to lose and nothing to gain by so doing.

It was the will to do good. It was patriotism for the human race which actually motivated them. They knew that it might cost them their lives, as it often did to give us food or to give us knowledge to live better. But, they loved us, the children of the future, so much that they were willing to even die for us. And today, our lives are infinitely better because of it.

And it was not just a few heroes whose names we know who gave their lives because of their love for mankind. Indeed, it was all men who ever lived: it was every mother who ever gave birth and every father who ever risked his life as he trudged across the glacier in search of food.

Some will say that it is merely instinct that motivates man to care for his children. That is empty semantics. By this reasoning, a mountain is not magnificent because it is merely gravity and the specific gravity of the rocks that makes it high. It is part of the definition of man and other mammals to protect their children. Calling it a biological instinct in no way detracts from the glory that is man. It is also a biological process which causes a homo-sapien's brain to grow and develop, but that in no way detracts from man's power or significance.

Man exists and has power over the universe because of characteristics that are implicit within his nature. The fact that man exists and has power indicates that these characteristics have value. It is impossible to describe real human characteristics without using words like altruism and unselfishness.

Put aside anarchistic, nihilist nonsense that man is evil as the superstitious

pagans say or meaningless or selfish as the atheists would have it. If man were more evil than good, or if he were merely a mechanistic, selfish, biologically compulsive robot, he would have destroyed himself centuries ago as most other life forms did. The dinosaurs and 90% of the species which have ever existed are currently extinct. Perhaps the reason they are extinct is because they were selfish biologically compulsive robots that did not care for their offspring. Their instincts were not sufficient to insure their survival. Man's were. Man's ancestors did care for our survival and we exist today because of it. Without our ancestors efforts and sacrifices, the human race would not exist. It is man's moral sense to cooperate with fellow men and to work together for the best interest of the children of tomorrow that keeps us alive today. The suggestion by nihilist atheists that life is meaningless or that man is a selfish automaton is insupportable. We exist today solely because of the heroic actions of our ancestors centuries ago.

The examples of Bruno, Galileo and thousands of others demonstrate that man is not a selfish, biologically compulsive robot. These men sacrificed their own best interests and even their lives for the best interests of the children of tomorrow. Where is the selfish biologically compulsive robot?

Atheists say that there is no purpose or meaning or morality; no reason or justification for human suffering; no implicitly good ethic in the universe. But there is in man because he creates that ethic and that purpose. And the maintenance of man's existence justifies that ethic because he is the source of it. According to evolutionary ethics, the purpose of the universe is the creation of consciousness and man is that consciousness. Then man is at once the ethic of the universe and the means through which that ethic is fulfilled. Perhaps God is the one who can ask the question, 'what is God.'

Although the nihilist atheists and fundamental religionists do not believe man is divine, the central purpose of the universe or the fulcrum of creation, they do place a great deal of importance on something. Fundamental religionists and atheists would raise science or religion above man. But it is not science that created man, but man that created science. Science and religion are no more than a collection of books and ideas produced by man. If science is important, then man is that much more important because man is the source of science. If it is important to maintain science or religion, then it is a thousand times more important to maintain life. The things that atheists and fundamental religionists think are so important are actually human characteristics and human creations. All of science and religion is just a book written by man. The most brilliant physics in the world is ultimately of no more value than a stone tied to a stick

compared to sacred divinity of the race of man that created it. The most important thing and the source of all things is not science or religion, but life.

Men are smeared as evil sinners by superstitious people and belittled as mechanistic automaton by atheists. And books and ideas are deified above man as if man hadn't written them. Science and the Bible are merely books and ideas created by man. Are not Darwin and Matthew men? Books are not greater than man. They are only a part of man. Books are not sacred. A book is an empty icon; a hollow imitation; a picture of life. The truth is not in a book: it is in your heart. Ultimately, human instinct is the source of all human conduct and of all human creations. The human being, the human mind, the human spirit is the driving force of all things.

Man is the real miracle, the real God and he has proven it for a thousand generations. All that is science or religion comes from him and is less than him. Books, sciences and religions are only a part of and an attempt to trace the greatness and the glory that is man. All the religions, all the sciences and all the books ever written are only a small part of the glory that is man.

Still there re foolish people, both fundamental religionists and nihilist atheist who say that these Bibles and Manifestoes are the epitome of human wisdom and that man would be hopelessly lost without them. What nonsense, what atheism, what blasphemy against the human spirit. How did we live all these thousands of years before the Bible or the Koran or the manifesto were written. Fundamental religionists have tried to take the credit for man's moral behavior. Mad did not behave in an ethical way because of fear of some ghosts in the sky, but because of love for mankind. A thousand thousand generations ago, man had not even heard of Jesus Christ, Karl Marx or Adam Smith. For countless generations, our ancestors knew enough to feed their children and to cooperate and to avoid killing one another. There were no priests, psychologists or scientists to tell them why, but they knew none the less. This sense of moral balance came from within the soul of man, not from some foolish book. Religions and sciences are merely an imperfect reflection of this human moral and scientific instinct.

Atheists, Christians and other superstitious bigots have become obsessed with papers, books and theories. As if some priest or some scientist pouring over mouldering books in the Vatican basement is going to tell us how to live. Why, one grandmother alone has more instinctive knowledge of life than is contained in all the books that we are taught to reverence so. Tell me one book that has the

knowledge to raise a family. Tell me one thing that is more important than that to human progress, knowledge and advancement. Are not men necessary for books and are not mothers and fathers necessary for men?

Instinct is still the ultimate source of human conduct and human creativity. We can know things that we can not prove. We have always known that it was wrong to kill or steal. And it is only because we have known that that we exist today. If we had not known, we would be as dead as the dinosaurs. When we forget these instincts, we will follow them to extinction as we are about to in the nuclear age.

This instinctive knowledge and belief in his own value and faith in the meaning of life has stood man in good stead for a thousand generations. Long before there was so much as a wheel, a written language or a plow, man knew that he must live. When Christianity and atheism are as dead as Isis and Ammon Ra, this faith will still live on in the heart of man.

This instinctive faith in life is what has enabled man to exist these many centuries. Now this faith is being belittled and attacked.

This sense of meaninglessness and nihilism that is felt by all in the post Darwinian age seems best expressed by the atheist when he says, "As long as there is one mistake in the universe; as long as one wrong is permitted to exist; as long as there is hatred and antagonism among mankind, the existence of a God is a moral impossibility."*

But perhaps God is not something that was, but rather something that is to be. In that case, it is just as logical to say the exact opposite, "As long as there is one correct thing in the universe; as long as one right is permitted to exist; as long as there is 'love' and 'goodwill' among mankind, the nihilist hypothesis is a scientific impossibility."

It is these same nihilist and anarchistic ideas that caused Captain Fitzroy to kill himself when Charles Darwin's discoveries exposed fundamental religion as myth. Fitzroy is symbolically representative of the whole human race. Today the whole human race is in a state of moral ennui because of the collapse of fundamental religion and our erratic behavior is a kind of attempted suicide. We are engulfed by nihilism and anarchy because of a kind of forced withdrawal from the narcotic superstitions of the past.

In a sense, all of us in this nihilist society are in agreement with the atheist Ingersoll when he said, "Injustice upon earth renders justice of heaven impossible." But one who looked forward to evolution rather than backward to creation could say the exact opposite with equal logical justification. "Justice upon earth renders the nihilism of atheism impossible." Perhaps God did not exist at the beginning of the chain of creation, but he may come into existence at the end of the chain of creation. So far as infusing purpose and meaning into life and the universe, it doesn't matter when God exists, whether in the past or in the future. Everything that man does will have meaning and significance in so far as it effects this process.

Then there is purpose in the universe and we can understand the meaning of all the suffering that we see around us in relation to its ultimate accomplishment. Justice could be defined as survival of the fittest and the purpose of life as the evolution of man toward perfection. Perhaps the universe is not the result of creation, but the beginning of a creation?

The atheist says that the giraffe is proof of the lack of design in nature and the blindness of the forces of evolutionary life.* The Promethean answers that the human brain is proof of purpose and design in nature and the foresight of the forces of evolutionary life.

Perhaps Robert Ardrey was right when he said that man is not a fallen angel but a risen ape. Atheists look backward to myths that never were and lament their loss as if they had once been true. A Promethean looks forward to glories that are to be and rejoices in the prospect. Atheists lament that the universe and man are not perfect. A Promethean rejoices that the universe and man are becoming more perfect, more conscious and more in control of the destiny and fate of the future.

The atheist says, "If man and the other forms of life upon this planet are a mere by-product of an over all plan of a supreme intelligence, then I denounce such a scheme as tyrannical and barbaric. Why should we be made to suffer such excruciating pains and penalties of life to satisfy that from which we derive no benefit and where death negates all of our efforts and which makes the purpose of life, our hopes and our desires, our ambitions and aspirations a cruel mockery."* The Promethean answers. "Your child is physically from the sperm and the egg. It did not appear from thin air. He is as much a part of you as your right and left hand. Through the evolution of you in our child, you may attain immortality and perfection. If you see your child and the perfection of mankind as no benefit, then

you deserve nothing but pains and penalties. Birth is also barbaric. Would you kill the fetus because of your vicarious cowardice? Our fathers endured starvation, glaciers, jungles, monsters through the struggles of eons of evolution so that we might be veritable Gods today. If you have not the courage to carry on the sacred flame of life, then die, but do not encourage others in your ignominious anti-life, anti-child cowardice."

*'An Atheist Manifesto', Joseph Lewis.

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Nihilism and Death are Myths

In view of the tremendous potential of the human race for good or evil, the suggestion made by nihilists that life is futile or meaningless seems incredible.

If we could see our progeny landing on another planet in a million years, or lying dead and disfigured after a nuclear war, all as a direct result of what we have done today, we would realize the ultimate significance and value of our efforts.

The nuclear dilemma makes it clearer than ever that those of us who are alive have the fate of the human race in our hands. If there are no people alive in a million years, it will be because we did something wrong today. If there are people alive in a million years, it will be because we did something right.

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Everything that we do today is contributing to the lives or deaths of the children of tomorrow. We determine by our actions today whether they will live or die.

Not only do the children of the future depend on us for the survival, we depend on them for ours. Only through them do we have a chance for immortality. We know that every living man has a pedigree that goes back millions of years and if man does not destroy himself, he will have a pedigree that will go forward millions of years. All the people who will be alive in a million years will be direct descendants of those who are alive today.

Each individual is not the beginning of life, but rather the extension of it. Life does not begin or end; it extends and as long as its offspring exists, it can not be said to die in any biological sense. Life does not appear out of thin air by spontaneous generation. A human child is formed from genes and chromosomes in the sperm and the egg. Where did the sperm and the egg come from if not from the parent? The same protoplasm and the same spark of life that existed in the parents continue their life and existence in the child. The child is just as much a

physical extension of the parents biological existence as the parent's hands or hearts.

This generation could not exist without the former and is in actuality an intrinsic part of the former. Each generation is like the branches of a tree extending toward eternity. Each generation is not independent of the former, but is rather an extension of it.

Life never stops or begins; it merely changes and improves. The only time life ever stops is when a species becomes extinct as in the case of the dinosaur. Scientists estimate that about 90% of the genes that exist in one member of a race exist in all members of that race. Thus, as long as the race exists, it is difficult to argue that death has occurred. A person is not just a fragile isolated mortal individual. Each person is, in fact, one cell in the immortal, eternal organism of the human race. If one cell appears to die, that is not real because the organism of the race which carries his genes continues.

From a biological point of view, your living protoplasm, genes and chromosomes do not cease to exist when your body appears to die. Because your child is you in the full physical sense, just as you are all those who have ever come before. You need not fear death for when your child experiences or achieves something a thousand thousand generations from now, it is you acting, you experiencing and you achieving.

And it is not merely you. It is an improved and perfected version of you. It is you with your weaknesses and failings removed. Through evolution, we can filter out all imperfections from headaches to poor eyesight and poor memory which now afflict us. This suffering need not be passed on to future generations. We will grow more and more nearly perfect. We will be stronger, faster and more intelligent. But we will always be the same physical, physiological spark of life and protoplasm that we are today only perfected and improved.

What then is life? What is mankind and what is each individual's relationship to it? Each man is one cell in the immortal eternal organism of man. When they crucified Mr. Christ or burned the scientist Bruno, they no more killed them than you can kill a man by pricking his finger with a pin. All men in each generation are not merely individuals: they are a branch in the tree of mankind. If a branch is cut off, the tree is not dead. Each generation is one link in the chain of life that leads from the animals to the Gods.

All men who have ever lived, are resurrected in you.

And you will be resurrected in all the men who will ever live into eternity.

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Born Again

For thousands of years, religious leaders and cultists have substituted religiosity for realism and fanaticism for truth. Evolutionary ethics teaches us that in a very real sense, our own thinking and our own being are the spirit and the substance of the deity we seek and the evil we wish to circumvent.

When we accept our place at the center of the universe, the human spirit, like the Phoenix, will arise from the ashes of superstition, sectarianism, orthodoxy, abstruse creeds and arrogant dogma to reenergize itself as a divine entity to fulfill its destiny and become a primary moving force capable of bringing peace and harmony to the human race.

Only after we have acknowledged the truly divine character of living humanity and after we have accepted the principle that every human life has explicit value because it is a life, will we be able to look beyond the superficial cloak of physical differences in humans that now divide us. Finally, the paradise that we have dreamed about as Heaven, Nirvana, Valhalla will no longer elude us but will materialize right here on the earth.

That real earthly paradise will be occupied by living, loving, mortal humans who no longer need glorify a mythical deity in a faraway region, because we will have recognized the celestial entity embodied within our own living spirit. Human minds will at long last accept a deity which is common to all humans—the life within our mortal bodies.

Human minds will at long last accept a deity which is common to all humans—the life within our mortal bodies.

We will be born again and a new world-wide religion will be possible; the principle tenet of which will be reverence for life—all life. Human longing and dreams expressed for centuries in literature, music, painting, and sculpture can be fulfilled. The world can be free of the pointless destruction of life which has been the result of distorted values, irrational thinking and human willfulness.

The new religion can bring about the emancipation of the human mind. We will no longer be burdened by fear and by the everlasting need to pay homage to invisible external spirits and we can finally escape the slavish marionette like existence that one inevitably suffers from in a Christian or nihilist atheist, (communist) world. I still can vividly remember my own experience when I realized that Christianity and communism were not the real things that created me and that I was the one thing that was real and they were merely figments of my imagination. It was as if a great weight had been lifted off my shoulders and I felt suddenly independent, important, valuable and free. I looked around me as though I had been blind all my life and had just been allowed to see. I saw children playing and houses being built and a magnificent civilization. All built by man, every idea, every stone, every post. I looked at the buildings and saw that I had built them and that they were good. I looked at the other people and saw that they were just like me. And I realized that his was real. Life was not futile. The things that I saw were real and were the result of man's love, ambition and divinity. I saw it stretch for miles beyond my sight. I looked back in time and saw centuries stretch back of men doing the same thing, giving, dedicating their lives, suffering and dying. Why? Not for nothing, but so that I might live today. All the men who have ever lived had given their lives for me. What courage, nobility, purpose.

As part of the immortal organism of man, I had the same opportunity, the same destiny, the same purpose and the same duty to further the progress of man. I realized that I was the one thing that mattered in the universe: that I was the center and purpose of everything that had ever been or would ever be. As the only consciousness in the universe, I was the fulcrum and focus of everything that was seen and understood and done. I knew suddenly what the ancient Christians felt when they contemplated God. I was born again. I was no longer an alien intruder in the universe or among mankind. I knew that I was not alone. I felt kinship with all men. They were all part of the same eternal organism of man that I was. We are all brothers working together for the next generation.

I saw that I was part of a larger purpose and that all my ancestors had fought for my survival and had eventually given their lives so that I might live today and that it was my destiny and my duty to do the same for my children. I saw that all the scientists, teachers and farmers of all preceding generations had worked and lived so that I might be born. I thought back to my school teachers and even tried to imagine the doctor who delivered me. I looked at the city and knew that it was the magnificent culmination of the work of millions of men for untold thousands of years. I saw that the things that I needed for my comfort and survival were put

there by man; car, house, food all in their infinite care for my survival.

There was no longer a feeling of emptiness. No longer a lack of purpose. I was the fulcrum of everything. Even unto the smallest frustration, not a moment of life was devoid of meaning. What I saw was God seeing, God doing, God feeling, God suffering. I was my ancestors succeeding and living into the present and on to eternity. Anything that was accomplished was of earthshaking importance. If the farmers did not produce food, the children would starve exactly as my ancestors would have a hundred years ago if the farmers had not produced then. If Bruno had not given his life for us, we would never have gone to the moon. And if Saulk and Harvey had not spent their lives to help us, we might not be alive at all. Who can tell what disease or plague they man have prevented?

I realized that together with my ancestors I shared credit for going to the moon as well as blame for the 30 years war. I understood that the children of the future were an extension of my immortality and that what I did during my life would have a direct bearing on whether these children would exist. I was one link in the eternal chain of creation. I was not an unthinking machine. I was not unimportant. I was the most important thing in the universe.

*Some ideas in this chapter are from "You Are Not Alone" by R. L. Hart

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God is Life

Is there a God that stands and reaches to the sky? Who has power over all the universe?

Who can build nuclear suns and tear apart planets and remake worlds? Who can fly through

the air like Apollo's chariot; and reach out and touch the stars, the surface of Jupiter and probe the depths of the sea? Is there such a being? Then I say to you earthman, you have arrived. You have answered the riddle of existence. You are now deserving of heaven's blessings. It is now time for you to meet God. Here is God. That God is you.

It is now time for you to meet God. Here is God.

That God is you.

Perhaps God did not exist at the beginning of the chain of evolution, but he may come into existence at the end. Evolution is the systematic and progressive development of life toward perfection. Evolution is the development of the energy of the universe in such a way that it has an increasing ability to consciously control itself and the universe around it. It is a progressive change from the unconscious to the conscious. We are the universe trying to comprehend itself. Man is the corporeal manifestation of the universe trying to control its own destiny. Man is God in the process of coming into existence.

The order of creation is exactly the opposite of that described by fundamental religion. We began millions of years ago as a spot of protoplasm on the bottom of a swamp and today we have powers that once were ascribed only to the Gods. And yet evolution has only begun. The human being is still evolving. We are like an amoeba or a dinosaur still in the early stages of evolution. We can only guess what evolution has in store for us in a million years.

God is usually described as a conscious being who purposely acts on and affects the universe. The human brain is the most powerful organizing and directing force in the universe. Since a tree or even a sun can not fulfill this destiny of directing the universe, the energy of the universe has invested itself in the human mind in order to accomplish what no other living thing is capable of doing.

The sun is a significant part of the energy of the universe, but even with all its

power, it still can not think about itself or build a microscope to examine itself or build a telescope to examine the universe around it. The most powerful sun in the universe could not create so much as a table. A great power, like the sun, without direction, is worth less than a small power like man with more self direction. The highest mountain, a volcano and even the sun is nothing compared to the brain of man.

Man is far from being a subservient helpless pawn in the hands of insuperable forces as atheists and fundamental religionists suggest. The moral duty of man as the only consciousness in the universe is infinitely greater than it was under any fundamentalist religion because man is responsible for what the universe will become. Under fundamental religion, man could not even really destroy himself because his soul was in the hands of God. According to evolutionary ethics, if man commits a sin by harming himself or any other man he is literally killing God in himself.

Our first moral obligation to the universe is to maintain our own life because if we do not exist, we can have no effect on the universe. In the case of dysgenic decline or nuclear war we find that superstition and sectarian atheism both jeopardize the health, the well being and the very survival of the human race by denying or confusing ethical priorities and moral responsibilities. Remember good and evil are not myths, but the mathematics of survival. Evil is putting loyalty to politics or religion over loyalty to mankind. Since we are the most powerful thing in the universe, the only thing that can destroy us is if we destroy ourselves by refusing to accept the moral responsibility for our actions. Nuclear suicide and dysgenic suicide are only possible in a society that refuses to accept the moral responsibility for what it does. Since man is the intelligence and the consciousness of the universe, he is responsible for the destiny of the universe and hence has a moral responsibility to preserve and improve himself.

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An open letter to the U.S. Congress:

I recently placed the enclosed ad in several newspapers, magazines and web Internet sites in several countries around the world, including North America, Europe, etc. As you will note from the [ad](#), I offer a free copy of the "Eugenic Manifesto", (see enclosure) to those who write and ask for one. I received a surprising number of requests for the book from people who were in prison. Often as not, these people claim to be political prisoners. That is, that they were imprisoned for their political beliefs, not because they committed a criminal act. I understand that the Lysenkoist Democratic Tyrannies in Europe, notably Germany, France and England and the European Union, have passed Orwellian Thought Crime laws which make the expression of certain ideas in print or some other form illegal and that many thousands of people including notably Gerhard Lauck of the USA, have been imprisoned merely because of the ideas they express. While there might be an altruistic motivation behind the passage of such laws, to prevent the incitement of violence and racial hatred, there is also an undesirable side effect, the prevention of reasoned and open discussion of the problems that the human family faces. The same law which put Gerhard Lauck in prison would put Charles Darwin in prison. If Charles Darwin wrote his book today, he'd be rooming with Gerhard. Once again, it seems, the human family must learn the old adage, "The end does not justify the means." The way to defeat totalitarianism is not to censor books like Darwin's "Origin of Species", which has already happened to a great extent. Even in the USA uncensored copies of "Origin of the Species" are generally not available in bookstores. I had to go to the library to find an old uncensored copy. The way to defeat totalitarianism is not to censor books, but to tell the truth. The recognition of the fact that the races are unequal does not signal the end of civilization, although the denial of that fact might. Does the recognition of the fact that siblings are unequal signal the end of the family unit? As I pointed out in the excerpt above from the "Eugenic Manifesto", the recognition of the fact of inequality does not preclude fair treatment.

My question is: If I do go to Denmark, Europe or Germany, will I be rooming with Gerhard because I included in my book, "Eugenic Manifesto" the uncensored subtitle of Darwin's "Origin of Species", "On the origin of species by means of natural selection or the preservation of favored races in the struggle for life"?

Please consider the negative effect that Orwellian thought crime laws have on free

scientific discussion. The names of historians, scientists and nobel prize winners who could be imprisoned under these laws reads like the roster of the best minds we have: Charles Darwin, David Irving, Dr. Shockley, Raymond Cattell, etc.

These laws against free inquiry

and open discussion cannot be allowed to go unchallenged. Any help you can render in this matter is greatly appreciated.

***Even in the USA
uncensored copies of
"Origin of the Species" are
generally not available in
bookstores.***

The children of the future thank you,

A handwritten signature in black ink, appearing to read "James L. Hart", written in a cursive style.

James L. Hart

An open letter to Gerhard Lauck:

Although Charles Darwin and I would both be considered racist by the Lysenkoist democratic tyrannies in Washington, Paris, Bonn and London, we in the eugenic movement do not accept the half science and half truth of the KKK and Nazis. The fact that the races are unequal is true, as far as it goes, but the KKK and Nazis want to stop there with half the truth. We in the eugenic movement, like Paul Harvey, want to tell "the rest of the story". You won't find it in "Mein Kampf" nor, I suspect, in the naturalization procedure for the KKK; but in "Eugenic Manifesto" I wrote: "Eugenics is a moral commitment not a racial affiliation and any "race" that adopted a eugenic program could, given sufficient time, evolve into and become the next more highly evolved species above Homo-Sapiens. It is our hope that all "races" will accept that moral responsibility and accomplish that objective, but it cannot be accomplished within the political, philosophical and religious milieu of the 20th century." This is a critical difference between the whole truth of the eugenic movement and the half truth of the KKK and Nazis, because the threat does not come from blacks, Mexicans, Jews or Chinese, but

rather from the very political and religious institutions that right wing conservative patriots are trying so desperately to protect and defend. If any race accepts the moral responsibility to protect the mental and physical health of its children, then that race will become the next more highly evolved species above Homo Sapiens. And here is the real question before us, a moral question: are we responsible for the destiny of man and the universe? The conservatives, like Pat Buchanan, answer that question in the negative and so do the liberals.

If man is responsible for the rain forest, the spotted owl and the snail darter, does he not have at least an equal responsibility for his own children? Suppose we continue the present policy of encouraging the least capable members of the human race to reproduce by giving them encouragement, welfare grants, and rewards for bearing more children? We will be crippling our own children with the genes that cause poverty, suffering, starvation, famine, physical and mental retardation. Clearly, the single measurable human characteristic most highly correlated with the ability to produce civilization is intelligence, and intelligence is determined 75% by inheritance and 25% by environment, according to the Encyclopedia Britannica. It is mathematically impossible for any society, regardless of racial composition, to exist over time if it practices a social welfare program, unless it implements a eugenic program in conjunction with it. Over an infinite time frame, such a Lysenkoist democratic tyranny must inevitably destroy itself because eventually there would be more people consuming goods than there would be people who had the ability to produce these goods, and the very people who we are trying to help would starve. Clearly, eugenics is a prerequisite for the existence of a technologically advanced society just as a wheel, a written language or a plow are. The right wing and the left wing are ready to blow the world up in a nuclear conflict between Lysenkoist environmental determinist fairy tales like capitalism and communism, but adamantly refuse to take any action on a public health issue like eugenics which could directly improve the human condition without war.

The difference between the right wing and the eugenic movement is this: the right wing believes that our fundamental political and religious institutions are sound and will save us, whereas the eugenic movement believes that these institutions are corrupt; that they are the very cause of our problems and that they will destroy us. As I said in the "Eugenic Manifesto", "Our problems spring not from communist conspiracies, Jewish world plots, Illuminati, blacks or Bilderbergers, but rather from the very institutions that right wing conservative patriots are trying so desperately to protect and defend. Conservatives would have us believe that we can save civilization by simply allowing resegregation of

the more "favored races" and less "favored races" or by returning to the ideas of fundamentalist religion and ancient political dogma like the Declaration of Independence." Actually, we could run our government and our society today with archaic aphorisms like "We hold these truths to be self evident that all men are created equal", or "turn the other cheek" and "give all you have to the poor", just as easily as we could drive an 18th century carriage to the moon. Stopping immigration will not save us. The destruction of Jewish power and communism will not save us. Only the acceptance of the moral responsibility for the fate of our children and the destiny of the universe will save use and neither the right wing or the left wing is willing to do that.

We as a species suffer today because we have never accurately answered the ancient riddle of good and evil or the purpose of life.

Our history, philosophy, religion and politics reveal and astounding record of chaos and meaningless conflict; a whirlwind of anarchy without any ream meaning or understanding.

Today, as ever, the right wing and the left wing have not idea. They don't have a clue. Yet, we persist in pretending that the king's nakedness is the finest robe.

Take Pat Buchanan for example. I call him Patrick Bunker, you know, Archie Bunker's brother. I wouldn't call him conservative, rather stone age. He's the first one since Martha Washington who wants prayer returned to public schools and sex education back where it belongs, on the street corners. Pat says he is against birth control, family planning, and sex education. I guess we'll go back to having children like we used to, by accident. I wouldn't call him old fashioned, but the globe on his desk is flat. Pat's position on abortion is simple, you can't have one. Rape, incest, spina bifida—hey, you're just stuck. You see, like his contemporaries of 2,500 years ago and his friends in the Ku Ku Coalition, Pat thinks the world is flat and children are conceived by immaculate conception. Pat's positive that he is not being self righteous or narrow minded on this. Although other churchmen, philosophers, and sociologists have been debating the pros and cons of abortion for centuries, Pat has an advantage over all of them because of his intimate knowledge of the mind of God. You see, Pat is the only one I know of who has an autographed picture of God on his desk. And, according to Matthew, Mark, Luke, John...and Patrick, children are born by immaculate conception. Rape or incest not withstanding, the gospel according to Saint Patrick would have us believe that "Casper", the "holy ghost" comes down and picks one sperm out of millions and

matches it alone with the egg and determines that the child will be born with downs syndrome, mental retardation, spina bifida and club foot and that it would be a sin against the "holy ghost..." for a parent to protect his children of the future generations from physical or mental defects by getting a eugenic abortion. If there were such a "holy ghost" that maimed and crippled our children of future generations, we wouldn't call it "God" but the "devil". Ridiculous as all this sounds, there are actually members of the bizarre "devil worship cult of Saint Patrick" who muck about murdering doctors at abortion clinics and mad bombers who blow up these institutions which probably have an altruistic and eugenic effect on future generations.

The right wing shows pictures of aborted fetuses. I would like to show pictures of the retarded ward in a hospital.

Because we are in eugenic movement understand that our problems come from the right wing and will not be solved by the right wing, we would never support Pat Buchanan despite his exemplary opposition to welfare, affirmative action, foreign aid, illegal immigration, promiscuity, etc. Because

Gerhard Lauck, like the rest of the right wing, misunderstood the threat as coming from blacks, Mexicans, Jews, etc., rather than from our own archaic societal institutions, he like the rest of the misguided right wing supported Pat Buchanan in the presidential race. It is easy to understand that if any technologically advanced society declared a wheel, a written language, a plow, or mathematics to be sinful and refused to use these tools, that society would fail and the population, regardless of racial composition, would perish. In fact, the same thing would happen if a society followed Pat Buchanan's lead and declared eugenics "sinful" and refused to use it. It just takes longer. Our problems are caused by the conservative ideas that all men are created equal and on purpose by a holy ghost, and that it would be sinful to accept our moral responsibility to implement eugenic abortions and family planning to protect and improve the health and ability of future generations. It is these very conservative ideas themselves that have created the dysgenic disaster and genetic sewer in our inner cities. If Pat Buchanan were to gain power, the same dysgenic decline and destruction of the human race would continue apace until civilization itself utterly collapsed. It is little consolation that these genetically crippled animals, that our children would become, would be white Christians. It would be far better to have a multiracial society based on eugenics and evolutionary ethics which produced healthy

children than to have a right wing lysenkoist democratic tyranny produced by the likes of Pat Buchanan where our children are all retarded basket cases covered with feces and urine who happen to also be white Christians. Such is the fate of our children if Pat Buchanan's barbaric, medieval opposition to eugenic abortion or opposition to family planning ever becomes national policy. The right wing shows pictures of aborted fetuses. I would like to show pictures of the retarded ward in a hospital. The indescribable anguish of seeing our children in such agony and knowing that a eugenic abortion could easily have converted this bundle of pain and torment into a beautiful, healthy child glowing with happiness and ability as he rides a bike or sets a path to the stars is unbearable to me. We must accept our moral responsibility to man and the universe to protect the right of future generations to be born physically healthy and mentally capable.

Eugenics is not cruel. On the contrary, it is the highest expression of concern and love for the children of the future. The suffering in this world is not caused solely by environment but partly by genetics. Thus, the cure for poverty, ignorance, or famine must involve genetic improvement. Poverty, ignorance and starvation can only be eradicated by removing the genetic and environmental combinations responsible for this human suffering. The cause of our suffering is within us. The source of our salvation is also within us.

The children of the future thank you,

A handwritten signature in black ink that reads "James L. Hart". The signature is fluid and cursive, with a long horizontal stroke at the end.

James L. Hart

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The Eugenic Movement is not trying to be a Fortune 500 company. We do not see life as a 'game show'. We do not want the luggage and the trip to Acapulco. We want tomorrow.

Anyone who wishes to quote sections of the book for purpose of reference or review is encouraged to do so.