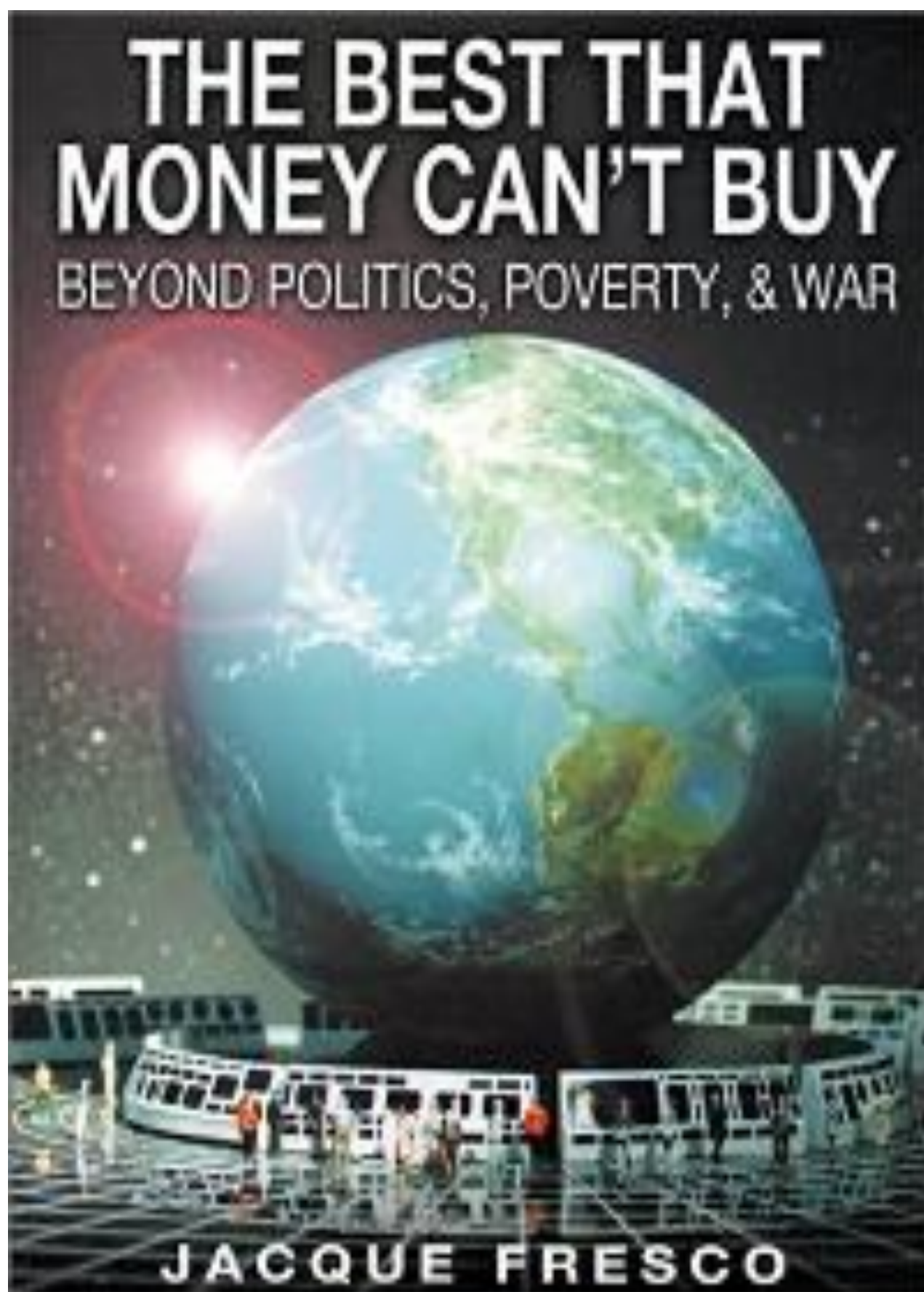


THE BEST THAT MONEY CAN'T BUY  
BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco



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BY JACQUE FRESCO

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JACQUE FRESCO & ROXANNE MEADOWS

Model Designs  
JACQUE FRESCO

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VENUS \* FLORIDA

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## INTRODUCTION

FEW TECHNOLOGICAL ACHIEVEMENTS are as impressive as the ability to see our own planet from outer space. The beautiful sphere suspended against the black void of space makes plain the bond that the billions of us on Earth have in common.

This global consciousness inspires space travellers who then provide emotional and spiritual observations. Their views from outer space awaken them to a grand realization that all who share our planet make up a single community. They think this viewpoint will help unite the nations of the world in order to build a peaceful future for the present generation and the ones that follow.

Many poets, philosophers, and writers have criticized the artificial borders that separate people preoccupied with the notion of nationhood. Despite the visions and hopes of astronauts, poets, writers, and visionaries, the reality is that nations are continuously at war with one another, and poverty and hunger prevail in many places throughout the world, including the United States.

So far, no astronauts arriving on Earth with this new social consciousness has proposed to transcend the world's limitations with a world where no national boundaries exist. Each remains loyal to his/her particular nation-state, and doesn't venture beyond patriotism – "my country, right or wrong" – because doing so may risk their positions.

Most problems we face in the world today are of our own making. We must accept that the future depends upon us. Interventions by mythical or divine characters in white robes descending from the clouds, or by visitors from other worlds, are illusions that cannot solve the problems of our modern world. The future of the world is our responsibility and depends upon decisions we make today. We are our own salvation or damnation. The shape and solutions of the future depend totally on the collective effort of all people working together.

Science and technology race into the future revealing new horizons in all areas. New discoveries and inventions appear at a rate never seen before in history and the rate of change will continue to increase in the years to come.

Unfortunately, books and articles attempting to describe the future have one foot rooted in the past, and interpret the future through today's concepts and technology. Most people are comfortable and less threatened with this perspective on change. But they often react negatively to proposals suggesting changes in the way they live. For this reason, when speaking of the future, very few explore or discuss changes in our social structure, much less our values. People are used to the structures and values of earlier times when stresses and levels of understanding were different. An author who wants to publish steers clear of such emotional and controversial issues. But we feel it is time to step out of that box. In this book we will freely explore a new future—one that is realistically attainable and not the gloom and doom so often presented today.

Few can envision a social structure that enables a "Utopian" life style as compared to today's standards, or that this lifestyle could be made available without the sweat of one's brow.

Yet thanks to our labor-saving machines and other technological advances, the lifestyle of a middle class person today far exceeds anything that even kings of the past could have experienced.

Since the beginning of the machine age, humankind has had a love/hate relationship with its mechanical devices. We may like what the machines do for us, but

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we don't like what they do to us. They take away our means of making a living, and sometimes our sense of purpose which derives from thousands of years in which hand labor was the primary means of meeting human needs.

Many fear that machines are becoming more and more complex and sophisticated. As dependence on them grows, we give up much of our independence and come to resemble them as passionless unfeeling automations whose sole purpose is work, work, work. Some fear that these mechanical children may develop minds and wills of their own and enslave humanity.

Many worry about conformity and that our values and behaviours will change so that we lose the very qualities which make us human. The purpose of this book is to explore visions and possibilities for the future that will nurture human growth and achievements, and make that the primary goal of society. We will discuss the many options and roles individuals will play in this cybernated age in which our world is rebuilt by prodigious machines and governed by computers.

Most writers of the twentieth century who presented a vision of the future were blinded by national ego or self-centeredness, and didn't grasp the significance and meaning of the methods of science as they might be applied to the social system.

Although it may appear that the focus of this book is the technology of the future, our major concern is the effect a totally cybernated world would have on humanity and on the individual. Of course no one can predict the future with precision. There are simply too many variables. New inventions, natural and man-made disasters, and new uncontrollable diseases could radically alter the course of civilisation. While we cannot predict the future, we will most surely live it. Every action and decision we take – or don't – ripples into the future. For the first time we have the capability, the technology, and the knowledge to direct those ripples.

When applied in a humane matter, the coming cybernated age could see the merging of technology and cybernetics into a workable synergy for all people. It could achieve a world free of hunger, war, and poverty – a world humanity has failed to achieve throughout history. But if civilization continues on its present course, we will simply repeat the same mistakes all over again.

If we apply what we already know to enhance life on Earth, we can protect the environment and the symbiotic processes of living systems. It is now mandatory that we intelligently rearrange human affairs so as to live within the limits of available resources. The proposals of this book show limitless untapped potentials in the future application of new technologies where our health, intellect, and well-being are involved. These are potentials not only in a material sense but they also involve a deep concern for one another. Only in this way can science and technology support a meaningful and humane civilization.

Many of us who think seriously about the future of human civilization are familiar with stark scenarios of this new millennium – a world of growing chaos and disorder, soaring populations, and dwindling natural resources. Emaciated children cry out from decayed cities and areas urban sprawl, air and water pollution, and escalating crime take a toll on the quality of life even for those who consider themselves removed from these conditions. Even the very wealthy are at a tremendous disadvantage because they fail to grasp the damage from technology applied without social concern.

Given the advances in science and technology over the last two hundred years, one may well ask: "does it have to be this way?" There is no question that the application of science and technology can carry us with confidence and assurance into the future. What is needed is a change in our direction and purpose. Our main problem is a lack of

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understanding of what it means to be human and that we are not separate from nature. Our values, beliefs, and behaviour are as much a part of natural law as any other process. We are all an integral part of the chain of life.

In this book we present an alternative vision of a sustainable new world civilization unlike any social system that has gone before. Although this vision is highly compressed, it is based upon years of study and experimental research. We call for a straightforward redesign of our culture in which the age-old problems of war, poverty, hunger, debt, and unnecessary suffering are viewed not only as avoidable, but also as totally unacceptable. Anything less results in a continuation of the same catalog of problems inherent in the present system.

## 1.A DESIGN FOR THE FUTURE

THE FUTURE IS FLUID. Each act, each decision, and each development creates new possibilities and eliminates others. But the future is ours to direct. In the past, change came so slowly that generations saw minimal difference in the daily business of surviving. Social structures and cultural norms remained static for centuries.

In the last fifty to a hundred years, technology and social change accelerated to such an extent that governments and corporations now consider change management a core process.

Hundreds of books address technological change, business process management, human productivity, and environmental issues. Universities offer advanced degrees in public and environmental affairs. Almost all overlook the major element in these systems – human beings and their social structures and culture. Technology, policy, and automation count for nothing until human accept them and apply them to their daily lives. This book offers a blueprint to consciously fuse these elements into a sustainable future for all as well as for fundamental changes in the way we regard ourselves, one another, and our world. This can be accomplished with technology and cybernetics being applied with human and environmental concern to secure, protect, and encourage a more humane world for all.

How can such a prodigious task be accomplished? First, we must survey and inventory all of our available planetary resources. Discussion about what is scarce and what is plentiful is just so much talk until we actually measure our resources. We must first baseline what there is around the world. This information must be compiled so we know the parameters for humanizing social and technological development.

This can be accomplished using computers to assist in defining the most humans and appropriate ways to manage environmental and human affairs. This is basically the function of government. With computers processing trillions of bits of information per second, existing technologies far exceed the human capacity for arriving at equitable and sustainable decisions concerning the development and distribution of physical resources. With this potential, we can eventually surpass the practice of political decisions being made on the basis of power and advantage.

Eventually, with artificial intelligence, money may become irrelevant, particularly in a high-energy civilization in which material abundance eliminates the mindset of scarcity. We have arrived at a time when the methods of science and technology can provide abundance for all. It is no longer necessary to consciously withhold efficiency through planned obsolescence, or to utilize an old and outworn monetary system.



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Although many of us consider ourselves forward-thinkers, we still cling tenaciously to the old values of the monetary system. We accept without sufficient consideration a system that breeds inefficiencies and actually encourages the creation of shortages.

For example, while many concerns about environmental destruction and the misuse of technology are justified, many environmentalists draw bleak scenarios about the future based on present-day methods and shortages. They view environmental destruction from the point of view that existing technologies are wasteful and used irresponsibly. They are accustomed to outmoded concepts and the economic imperatives of sales turnover and customer appeal. Although we recognize that technological development has been misdirected, the benefits far outweigh the negatives. Only the most diehard environmental activist would turn his back on the man elevating advances made in areas like medicine, communications, power generation, and food production.

If human civilization is to endure, it must outgrow our conspicuous waste of time, effort, and natural resources. One area in which we see this is architecture. Resource conservation must be incorporated into our structures.

While many urban centers grapple with retrofitting new, more efficient technologies into their existing infrastructures, these efforts fall far short of the potential of technology. Not only must we rebuild our thought patterns, but much of our physical infrastructure, including industrial plants, buildings, waterways, power systems, production and distribution process, and transportation systems must be reconstructed from the ground up. Only then can our technology overcome resource deficiencies and provide universal abundance.

If we are genuinely concerned about the environment and the fellow human beings, and want to end territorial disputes, war, crime, poverty, hunger, and the other problems that confront us today, the intelligent use of science and technology are the tools with which to achieve a new direction – one that will serve all people, and not just a select few.

The purpose of this technology is to free people from repetitive and boring jobs and allow them to experience the fullness of human relationships, denied to so many for so long. This will call for a basic adjustment in the way we think about what makes us human. Our times demand the declaration of the world's resources as the common heritage of all people.

In a hundred years, historians may look back on our present civilization as a transition period from the dark ages of ignorance, superstition, and social insufficiency just as we view the world of a few hundred years ago. If we arrive at a saner world in which the maximum human potential is cultivated in every person, our descendants will not understand why our world produced only one Louis Pasteur, one Edison, one Tesla, or one Salk, and why great achievements in our age were the products of a relative few.

In looking forward to this new millennium, and back at the dimmest memories of human civilization, we see that the thoughts, dreams, and visions of humanity are limited by a perception of scarcity. We are products of a culture of deficiency which expects each confrontation and most activities to end with a winner and a loser. Funding restricts even technological development, which has the best potential to liberate humanity from its past insufficiencies.

We can no longer afford the luxury of such primitive thinking. There are other ways of looking at our lives and the world. Either we learn to live together in full cooperation or we will cause our own extinction. To fully understand and appreciate this

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coming age, we must understand the relationship between creation and creator: the machine and, as of this writing, that most marvellous of mechanisms – the human being.

## 2.CHANGING VALUES IN AN EMERGING CULTURE

ANY ATTEMPT TO DEPICT THE FUTURE DIRECTON of civilization must include a description of the probable evolution of our culture without embellishment, propaganda, or national interest. We must re-examine our traditional habits of thought if we wish to avoid the consequences that will occur if we do not prepare for the future. It is unfortunate that most of us envision this future within our present social framework, using values and traditions that come from the past. Superficial changes perpetuate the problems of today. The challenges we face now cannot be addressed with antiquated notions and values that are no longer relevant.

Imagine a new planet with the same carrying capacity as Earth, and that you are free to design a new direction for the society on this planet. You can choose any shape or form. The only limitation imposed upon you is that your social design must correspond to the carrying capacity of that planet. This new planet has more than adequate arable land, clean air and water, and an abundance of untapped resources. This is your planet. You can rearrange the entire social order to correspond to whatever you consider the best of all possible worlds. Not only does this include environmental modification, but also human factors, interpersonal relationships, and the structuring of education.

This need not be complicated. It can be an uncluttered approach, not burdened by any past or traditional considerations, religious or otherwise. This is a prodigious project calling for many disciplines, determining the way inhabitants of your planet conduct their lives – keeping in mind for whom and for what ends this social order is being designed. Feel free to transcend present realities and reach for new and inventive ideas to shape your world of the future. An exciting exercise isn't it? What we propose is nothing more, nothing less, than applying that exercise to our planet.

To prepare for the future we must be willing to test new concepts. This means we must acquire enough information to evaluate these concepts, and not be like travellers in a foreign land who compare everything with their own hometown. To understand people of another place we must set aside our usual expectations of behaviour, and not judge by the values to which we are accustomed.

If you believe today's values and virtues are absolute and ultimate for all times and all civilizations, then you may find our projection of the future shocking and unacceptable. We must feel and think as freshly as possible about the limitless possibilities of life patterns humankind may explore for attaining even higher levels of intelligence and fulfilment in the future.

Although individuals like Plato, Edward Bellamy, H.G. Wells, Karl Marx, and Howard Scott have all made attempts to plan a new civilization, the established social order considered them impractical dreamers with Utopian designs that ran contrary to the human nature. Against these social pioneers was a status quo of vested interests comfortable with the way things were. The populace at large, because of years of indoctrination, went along unthinkingly for the ride. Vested interests were unappointed

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guardians of the status quo. The outlook and philosophy of the leaders were consistent with their positions of advantage.

Despite advances achieved through objective scientific investigation, and the breaking down of long-standing fears and superstitions, the world is still not a reasonable place. Many attempts to make it so have failed because of selfish individual and national interests. Deeply rooted cultural norms that assume someone must lose for someone else to gain (scarcity at its most basic) still dictate most of our decisions. For example, we still cling to the concept of competition and accept inadequate compensation for people's efforts, (i.e., the minimum wage), when such concepts no longer apply to our capabilities and resources, never mind their effect on human dignity and any possible elevation of the human condition.

At this turning point in our civilization, we find problems complicated by the fact that many of us still wait for someone, a messiah perhaps, the elusive "they", or an extraterrestrial to save us. The irony of this is that, as we wait for someone to do it for us, we give up our freedom of choice and movement. We react rather than act toward events and issues.

The future is our responsibility, but change will not take place until the majority lose confidence in their dictator's and elected officials' ability to solve problems. It will likely take an economic catastrophe resulting in enormous human suffering to bring about true social change. Unfortunately, this does not guarantee that the change will be beneficial.

In times of conflicts between nations, we still default to answering perceived threats with threats, developing weapons of mass destruction, and training people to use them against others whom we regard as enemies. Many social reformers tried to solve problems of crime within the framework of the monetary system by building more prisons and enacting new laws. There was gun legislation and a "three times and you're out" provision in an attempt to govern crime and violence. This has accomplished little, yet requests for funding to build more prisons and hire more policemen fare far better in legislatures and voting referendums than do pleas for education or aid to the poor. Somehow in an area of plenty, we have meanly approved punishment as an answer to all problems. One symptom of insanity is repeating the same mistake over and over again and expecting a different outcome. Our society is, in this sense, truly insane.

The Manhattan Project developed the first atomic device to be used against human populations, and launched the most intensive and dangerous weapons build-up in history. The Manhattan Project was also one of the largest and best-financed projects ever undertaken. If we are willing to spend that amount of money, resources, and human lives in time of war, why don't we commit equal resources to improving lives and anticipating the humane needs of the future? The same energies that went into the Manhattan Project could be used to improve and update our way of life, and to achieve and maintain the optimal symbiotic relationship between nature and humankind.

If our system continues without modification involving environmental and social concern, we will face an economic and social breakdown of our monetary and political system. When this occurs, the established government will likely enact a state of emergency or martial law to prevent total chaos. I do not advocate this, but without the suffering of millions it may be nearly impossible to shake our complacency about the current ways of life.

## OUT OF THE DARK AGES

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Scientists in the space program face different challenges. For example, space scientists must develop new ways of eating in outer space. Astronauts' clothing must withstand the vacuum of outer space, enormous temperature differentials, and radiation yet remains light in weight and highly flexible. This new clothing design even calls for the development of self-repairing systems. Their challenge is to conceive of common items in completely new ways. In space, for example, clothing no longer functions as just body covering and adornment. It becomes a mini-habitat.

The space age is a good example of the search for newer and better ways of doing things. As scientists probe the limits of our universe, they must generate newer techniques and technologies for unexplored frontiers and never-before-encountered environments. If they cling to the concepts of their earlier training, their explorations will fail. Had our ancestors refused to accept new ideas, the physical sciences would have progressed little beyond the covered wagon.

Many young engineers, scientists, and architects face this dilemma. Bold and creative, they exit institutions of higher learning and step out into the world eager for change. They set out with great enthusiasm but are often beaten back and slowed by the established institutions and self-appointed guardians of tradition. Occasionally, some break away from traditional concepts and become innovations that their daring concepts are soon reduced to mediocrity.

Many of the dominant values shaping our present society are medieval. The idea that we live in an enlightened age, or an age of reason, has little basis in fact. We are overwhelmed with valid information concerning ourselves and our planet, but have no inkling of how to apply it. Most of our customs and modes of behaviour have been handed down to us from the Dark Ages.

It was difficult for early forms of life to crawl out of the primordial slime without dragging some of it with them. So it is with entrenched value systems. The most appropriate place for traditional concepts is a museum or in books about the history of civilization.

The twenty-first century will reveal what most people never suspected, which is that the majority of us have the potential of people like Leonardo da Vinci, Alexandre Graham Bell and Madam Curie, if we are raised in an environment that encourages genuine individuality and creativity. This includes all the other characteristics thought of as the special and privileged heredity of great men and women.

Even in today's so-called democratic society, fewer than 4% of the world's people have supplied us with the scientific and artistic advances that sustain social systems.

## SHAPING HUMAN VALUES

Humans of the future, though similar in appearance, will differ considerably in their outlook, values, and mindset. Social orders of the past that have continued into the twenty-first century consistently seek to generate loyalty and conformity to established institutions as the only means to sustain a workable society. Countless laws, often passed after a misdeed has occurred, have been enacted in an attempt to govern the conduct of people. Those who do not conform are ostracized or imprisoned.

In the past, many social reformers and those called agitators by their detractors were not generally angry maladjusted individuals. They were often people with a sensitivity and concern for the needs of others who envisioned a better life for all.

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Among these were abolitionists, advocates for woman's suffrage and child labor laws, those who practiced non-violent resistance to oppression, and so-called "freedom fighters".

Today we accept without question the achievements of these reformers who faced violent opposition, imprisonment, ridicule, and even death from vested interest and the established order. Unfortunately most people are unaware of the identities of those individuals who helped pave the way toward social enlightenment.

Many of our parks have statues of warriors and statesman, but few have any monuments to the really great social innovators. Perhaps when the history of the human race is finally written, it will be from the viewpoint of individuals in an alien and primitive culture who sought change in a world that had great tenacity to maintain things as they were.

Conformity in a population makes control of society much easier for its leaders. Our leaders pay lip service to the freedoms that democracy provides, while actually supporting an economic structure that imprisons its citizens under more and more debt. They claim that all have the opportunity to rise to the top through individual initiative and incentive. To appease those who work hard but do not achieve the good life, religion is there to assure them that if not in this life, they will obtain it in the next.

Our habits of thought and conduct show the effectiveness of constant and unrelenting propaganda on radio, television, in publications, and in most other media. They are so effective that the average citizen is not insulted when categorized as a consumer – as if a citizen's sole worth to society was as a user of goods. These patterns are gradually being modified and challenged by the Internet and the World Wide Web.

Most people expect that our televisions, computers, communication systems, methods of production and delivery of services, and even our concept of work and reward, will continue to improve without any disruption or distress within our present value systems. But this is not necessarily so. Our dominant values that emphasize competition and scarcity limit continued progress.

The most disruptive period in a transition from an established social order to an emergent system comes when people are not prepared emotionally or intellectually to adjust to change. People cannot simply erase all the beliefs and habits acquired in the past, which constitute their self-identity. Sudden changes in values without some preparation will cause many to lose their sense of identity and purpose, isolating them from a society they feel has passed them by. Another factor limiting the evaluation of alternative social proposals is a lack of understanding of basic scientific principles and the factors shaping culture and behaviour.

The conflict today between human beings is about opposing values. If we manage to arrive at a saner future, conflicts will be about problems common to all humans. In a vibrant and emergent culture instead of conflicts between nations, the challenges will be overcoming scarcity, reclaiming damaged environments, creating innovative technologies, increasing agricultural yield, improving communications, building communications between nations, sharing technologies, and living a meaningful life.

## WORK AND THE NEW LEISURE

From early civilization to the present most humans had to work to earn a living. Most of our attitudes about work are a carry-over from these earlier times. In the past (and still in many low-energy cultures), it was necessary to fetch water and carry it to

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one's dwelling place. People gathered wood to make fires for heating and cooking, and fuel to burn in their lamps. It would have been very difficult – and still is for some – to imagine a time when water would rush forth in your own dwelling at the turn of a handle; to press a button for instant light would have seemed to be magic. People of ancient times probably wondered what they would do with their time if they did not have to engage in these burdensome tasks that were so necessary to sustain their lives. In most developed countries, tasks that were once so vital to people's very survival are no longer necessary, thanks to modern technology.

Today people attend schools to acquire marketable skills that enable them to earn a living in the "work-a-day" world. Recently, the belief that one must work to earn a living has been challenged. Working for a living to supply the necessities of life may soon be irrelevant as modern technology can provide most of these needs. As a result, many jobs have gone the way of the iceman and the elevator operator. Perhaps we have a semantic problem with the word "work". The idea of "freedom from work" should include the elimination of repetitive and boring tasks that hold back our intellectual growth. Most jobs, from blue-collar assembly worker to professional, entail repetitious and uninteresting tasks. Human beings possess an untapped potential that they will finally be able to explore once they are free of the burden of having to work to earn a living.

At present there are no plans in government or industry to make economic adjustments to deal with the displacement of people by automated technology. It is no longer the repetitious work of labourers that cybernation is able to phase out, but also many other vocations and professions. Engineers, technicians, scientists, doctors, architects, artists, and actors will have their roles altered, sometimes drastically. Therefore, it is imperative that we explore alternatives so as to improve our social constructs, beliefs, and quality of life to secure and sustain a future for all.

### 3.LANGUAGE OF RELEVANCE

OF THE MANY ENTRENCHED BARRIERS to positive change, communication is one of the most intractable. Language has evolved over centuries through ages of scarcity, superstition, and social insufficiency, and it is continuing to evolve. However, language often contains ambiguity and uncertainty when important issues are at stake, and fails to use a precise and universally intelligible means of conveying knowledge. It is difficult for the average person, or even those considered above average, including leaders of nations, to share ideas with others whose worldview may be at considerable variance with their own. Also, because of semantic differences and different experiences, words have various shades of meaning.

What would happen if we made contact with an alien civilization, when we have such difficulty making contact with our fellow human beings? We are not ready for that. We haven't yet learned to resolve international differences by peaceful methods, so peace is simply a pause between wars.

Even in the United States, supposedly the most technologically advanced country in the world, we lack unified, definitively-stated direction. Our policies and goals are fragmented and contradictory. The Democrats cannot communicate meaningfully with the Republicans. Elsewhere, the Israelis oppose the Arabs, the Irish Catholics clash with the Irish Protestants, the Serbs with the Muslims. Everywhere there is interracial and interpersonal disharmony, an inability of husbands and wives to communicate with each

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other or their children, labor and management strife, and communists differing with capitalists.

How then could we hope to establish any meaningful communication with an alien civilization, with beings possessing intelligence, social coherence, and technologies far in advance of our own? The aliens might well wonder whether there really is intelligent life on Earth.

Most world leaders seek to achieve greater communication and understanding among the nations of the world. Unfortunately, their efforts have met with little success. One reason is that each comes to the table determined to achieve the optimal advantage for their own nation. We talk a lot about global development and global cooperation. But the "global" in each case reflects the individual nation's interests and not those of all people.

In addition, we are trapped within old ways of looking at our world. While most agree change is necessary, many limit change if it threatens their advantage, just as on a personal basis they seek change in others, but not in themselves.

Many of us lack the skills to communicate logically when we are emotionally invested in an outcome. If a person or group has difficulty in communicating a point in question, rather than seek clarification they will raise their voices. If this doesn't work, they may resort to physical violence, punishment, or deprivation as a means of achieving the desired behaviour. In some instances, deprivation of the means of earning a living has been, and continues to be, used.

These tactics have never produced a heightened level of understanding. In fact, many of these attempts to control behaviour actually increased violence and drove the parties farther apart. It will be difficult for a future historian to understand why the language of science and technology was not incorporated into every day communication.

Ambiguity may help lawyers, preachers and politicians, but it doesn't work in building bridges, dams, power projects, flying machines, or in space travel. For these activities we need the language of science. Despite a maze of ambiguity in normal conversation, the more serviceable language of science is coming into use throughout the world, particularly in technologically advanced countries.

If communication is to improve, we need a language that correlates highly with the environment and human needs. We already have such a language in scientific and technological communities and it's easily understood by many.

In other words, it is already possible to use a coherent means of communication without ambivalence. If we apply the same methods used in the physical sciences to psychology, sociology, and the humanities, a lot of unnecessary conflict could be resolved. In engineering, mathematics, chemistry, and other technical fields, we have the nearest thing to a universal descriptive language that requires little in the way of individual interpretation.

For instance, if a blueprint for an automobile is used in any technologically developed society anywhere in the world, the finished product would be the same as that in other areas receiving the same blueprint regardless of their political or religious beliefs.

The language used by the average person is inadequate for resolving conflict but the language of science is relatively free of ambiguities and the conflicts prevalent in our everyday, emotionally-driven language. It is deliberately designed – as opposed to evolving haphazardly through centuries of cultural change – to state problems in terms that are verifiable and readily understood by most.

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Most technical strides would have been unattainable without this type of improved communication. Without a common descriptive language, we would have been unable to prevent disease, increase crop yields, talk over thousands of miles, or build bridges, dams, transportation systems, and the many other technological marvels of this computerized age.

Unfortunately, the same is not true of conversational language. Attempts to discuss or evaluate newer concepts in social design are greatly limited by our habit of comparing newer concepts to existing systems and beliefs.

## IT'S A SEMANTIC JUNGLE OUT THERE

Utopian ideas have existed for as long as humans have dealt with problems and reflected upon a world free of them. The writers of scriptural references to Eden, Plato's Republic, H.G. Wells' Shape of Things to Come, and such concepts as socialism, communism, democracy, and the ultimate expression of bliss. Heaven have all shared this Utopian dream. All attempts at creating such a world have fallen far short of their vision, because the dreamers and visionaries who projected their Utopian concepts did so mostly within the framework and values of their existing culture. The language they used was limited and subject to a wide range of individual interpretation.

When we read and discuss new ideas, the information is automatically filtered through previous experiences and patterns of associative memory. In many instance what we end up with is something other than what the designers intended. Unfortunately, we live in a linguistic and semantic jungle. The language we inherited is insufficient and lacks the characteristics needed to allow ideas to be shared.

Here's an historical example: when presented with the possibility of transitioning from conventional aircraft to the flying wing during World War II (now employed very effectively in the B-1 Stealth bomber), people first noticed the absence of the tail assembly. This new configuration, so different from the conventional, made them uncomfortable and reactions were generally negative. Even technical people questioned the lack of stability believed to be inherent in the flying wing.

They responded with doubt and hostility. Had they used the appropriate language of investigation, they would instead have asked the designer how he intended to overcome the limiting factors in the earlier designs. The designer would have responded by presenting design specifications and, better yet, working models of the subject under discussion.

To discuss the redesign of a culture – nor Utopian, but simply in accordance with the knowledge and resources we have at hand – we must learn to outgrow our egos in exchange for constructive dialogue rather than debate. In addition we must be capable of stating problems and proposing solutions clearly and succinctly, without distortion of meaning or misunderstanding, even when these solutions are radically opposed to accept norms.

## CHANGING LANGUAGE

Language evolves along with people and their culture. With the development of newer technologies, our everyday language changes accordingly. But today our technology and culture are so pervasive that we need a language with more uniform meaning throughout the world. We need something like mathematics, a language that



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avoids semantic differences in interpretation. This new language should have symbols which closely approximate real events in the physical world. An advanced descriptive language will eventually be designed by artificial intelligence, and then continuously updated to remain relevant to existing and new situations.

As it becomes increasingly obvious that goals must be stated precisely, our language will undergo considerable modification. The future evolution of our language cannot be comprehended within the bounds of existing usage. It must undergo continuing refinement, and increase its scope of meaning before it will be an effective means of communication between people.

Gutenberg invented the printing press before the English alphabet and spelling had stabilized. Many of our language's idiosyncrasies still endure from those early days of experimentation. No sophistication of phrasing or vocabulary alters the fact that different words, and even the same words in different sequences, have so many possible interpretations. Their semantic connotations differ from sender to receiver and from receiver to others. Our language has an amazing richness and flexibility and easily accommodates change. But in the absence of mathematical precision, clear communication is a challenge.

The future language may transcend words as we know them in favor of a series of sound sequentially arranged to produce a desired response in others. Language is often an attempt to control behaviour through the transfer of information, valid, invalid, or even irrelevant to the situation.

In the future, people using computers could create a language that will provide closer understanding and a simpler structure, with less dependence on speech. For example, a series of signals combining acoustical, optical, olfactory, and teletactile electronic pattern will tell a story in seconds, rather than in many sentences or pages.

Such a methodology is not unlike that used by fish to find the Orinoco River when it's thousands of miles away from their starting point, and they haven't been there before. Fish have receptors that sense the earth's magnetic field, which to a large extent shapes their behaviour. In like manner imprinting in a bird probably elicits the nest-building pattern. When our technologies are more closely aligned with natural law, airplanes might use geomagnetic fields for navigation, just like birds.

A clearer, more efficient means of communicating would entail a more exact expression in human verbal interaction. It could encourage a new area of science, the science of significance and meaning. A more refined language could result in a rearrangement of the associative systems in the human brain, resulting in greater understanding and a reduction in conflict.

## BRIDGES OVER TROUBLED WATER

A myth is a concept or tale that has no factual evidence or proof. The word suggests a way of talking or stating problems in which the words used do not have a physical referent; that is to say, one cannot find agreement among people as to what, in the real world, the words are actually referring to. In this context, the author fears the idea of resolving conflict on the basis of mutual "understanding" is a myth as well.

For example, the likelihood of Jewish people resolving their conflict with Nazis through a free exchange of views is extremely remote, if not impossible. The same would be true if a well-educated African-American attempted to resolve a conflict with white

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supremacist organizations, or a scientist tried sharing the theory of evolution with religious fundamentalists. This illustrates that humans, as yet, are not rational beings.

Our current values of right and wrong, or good and bad, are the products of older social systems. Slogans and catch phrases like "God is on our side," "Think American," "successful person," "well adjusted," "mature outlook," and "sharing ideas," are all judgments and assessments reflecting the culture in which they originated. If we genuinely hope to bridge differences, we need a more precise language and a mindset open to new ideas.

Actually, there is no sharing of values and no communication at all if the parties don't have a common starting point, or are unwilling/unable to conceive of experiences outside their own. If a person believes that it is impossible to build a flying machine, the builder of a flying machine cannot share his/her knowledge about the idea, especially if the doubting party doesn't ask how it can be accomplished, or has already dismissed it in his/her mind.

How then, in a society that is culture-bound and has limited language and ideas, can we introduce listeners to new concepts which, even if they desire to learn them, have no connections in their experience and thinking?

We live in a perpetual "show me" state. When Nikola Tesla first introduced the wireless, there was no common understanding of the methods and dynamics of wireless transmission. So Tesla oriented the uninformed through a demonstration of the working processes.

In like manner films, books, seminars, videos, will be necessary to demonstrate the validity of our proposals.

## 4.FROM SUPERSTITION TO SCIENCE

THE CHALLENGES WE FACE TODAY CANNOT BE RESOLVED by antiquated notions and values that are no longer relevant. Unfortunately, we tend to support basic values and traditions that reflect the past, without questioning their appropriateness to the present or the future. The more superficial the changes, the more things remain the same. For us to think creatively about the future and examine our traditional habits of thought, we must become better informed. We must look at alternatives objectively, and not try to fit the future into our present social mold.

Today, millions of people throughout the civilized world worship different gods and fear demons, while some try to placate their gods with incantations, sacrifices, adulation, and flattery. Others use astrological charts and pendulums for arriving at decisions. Popular newspapers feature columns on astrology and television and radio airwaves are filled with psychic problem solvers. A noted psychic recently said we would be surprised at how many important decisions about running our country are in the hands of soothsayers and charlatans.

Until scientific inquiry came of age, human beings could not comprehend their relationship to the physical world so they invented their own explanations. These explanations tended to be simple, and some were harmful, resulting in religious rituals, superstitions, astrology, numerology, fortune telling, etc. Millions of people still accept and follow these ancient beliefs.

Scientists are not close-minded regarding these issues, but their standards for accepting such ideas require more rigorous and sophisticated proof. The difference

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between a scientist and a metaphysician is that a scientist asks question and engages in experiments to determine the nature of the physical world; this process also requires that the experiments be verified by others who must get the same results. In contrast, metaphysicians fabricate answers that are emotionally pleasing and require no verification, a process that is subjective and not in touch with the "real" or physical world.

Considering how metaphysicians rely on unverifiable information for direction, it is ironic to see them surrender lofty intuitive and spiritual interpretations of worldly things when it comes to their daily lives. When purchasing property, for example, they measure exactly how many squares feet are being exchanged for a given sum of money. When purchasing a new automobile, they ask how many miles per gallon the car will deliver, or the exact cost of buying it.

In fact, much our daily living involves the application of scientific principles. As B.F. Skinner said, "Intuitive feelings may tickle the cockles of a poet's heart", but they do nothing to enhance our knowledge of the physical world. What makes a person feel good or appeals to one's emotions does not necessarily add to one's understanding of the world.

Throughout history life, for most, has been a constant struggle against many problems: finances, health, personal safety, communal security, starvation, and much else. Finding no safe haven in a world where many are resigned to the consequences of original sin, theologians created the concept of a distant Heaven. This is a place of eternal bliss and limitless abundance, full of warmth and love, where people are free of destitution, greed, lust the need for money and all other afflictions that have plagued humankind for centuries.

To qualify for entrance into this world of eternal bliss, however, one must first die and also demonstrate impeccable behaviour while on earth. They must also engage in constant prayer to an intermediary for forgiveness of their transgression.

Others seek to attain this end while still on an earthly plane through meditation and/or renunciation of the material world. By this means they hope to experience Nirvana. While it may be true that meditation will alter their associative memory and develop a procedure for fulfilling their hopes, dreams, and wishes, the attainment of this state takes place only in their minds. This tendency to seek wish fulfilment and unique individual fantasy states often makes it difficult for people to tell the difference between the physical world and their fantasies.

People will continue to search for answers to universal and perplexing problems. But to find meaningful answers, one must first know what questions to ask. People pose complex questions without first having fundamental knowledge of what it is they are seeking.

In science, which is closer to the physical world, it is acknowledged that there are no absolutes. If science were to accept absolutes, scientific inquiry would come to an end.

There are many who are in search of the truth, but this is an endless search that takes a person nowhere. If we ever find out exactly who we are, it might be the end of human intellect. Whether consciously or not, most people continue to undergo changes in their values, outlook and understanding, a process that has no finality. Human beings are constantly evolving organisms. To evolve further, the question is: how do we select, from the many alternatives, those which are more appropriate?

A brief course in scientific principles enables a person to better understand the world and their relationship to it. We can only experience the world with our

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receptors and the degree of linguistic precision that our culture affords us. No one can view anything with the certainty that they perceive it as it really is. If a mouse could talk, it would describe a dog as an enormous creature, but a giraffe could say it is a tiny creature from his point of view. They are both telling the "truth" as they see it, but only from their own point of view.

Questions like "What is the meaning of life?" "What is consciousness and the mind?" "Why am I here?" "What is my relationship to God and the universe?" These questions have been asked for centuries. But they are irrelevant to achieving social progress. These are unanswerable questions because they don't express concern for fellow human beings, or a desire to elevate their condition. Such musings are gibberish in terms of practicality, and as impotent as wailing over an injured person instead of seeking medical attention for them.

Take, for example, the question "what is life, its meaning, and our relationship to the universe?" which is ultimately a hollow and meaningless question. Philosophers, poets, and metaphysicians cannot genuinely pursue the questions in terms of any actual processes. They usually understand little about the physical processes of nature. Those asking such questions don't go into the laboratory in pursuit of physical processes, nor do they typically understand the structure of even a single cell, let alone the universe. They are merely repeating quotations of other "verbalists" from the past, without making any effort to verify the validity of their own assumption. Although they feed these questions are profound, in the context of science and reality, they are actually naive.

Questions about the process we call life assume that life has "meaning." As difficult as it may be for many to accept, the only meaning life has is what we humans give it. Real concern about such profound questions is better manifested by engaging in research into the characteristics and mechanics of living systems. The same principle applies when an increase in criminal behaviour requires investigations into the factors that shape human behaviour.

Merely talking about things we do not understand does not add to our knowledge. For example the word "instinct" does not tell us anything about the behaviour of an organism. It is a word symbolizing patterns of behaviour many do not understand. Instead of the word instinct, we need precise information on the actual processes by which fish migrate, birds, build nests, and organisms adapt to their environments.

One may reasonably ask: Why do people cling to the values and practices of the past, when they so obviously no longer work? Long-standing thought patterns are hard to overcome because they often appear to serve the interests of the individual, and old ways of thinking are simpler and easier to handle. In a two-valued way of thinking, as in good and bad, right and wrong, love and hate, cause and effects, very little logical analysis is involved.

Also, few of us are adequately equipped for analytical thinking. Analytical thinking requires an understanding of process and a broad range of information. We are insufficiently equipped and trained to objectively evaluate alternative proposals. Science is taught as a series of discrete specialists, as if biology, chemistry, and physics were not really a single science. No school we know of presents science in a significantly holistic way. Students learn narrow principles, laws, and processes, rather than the scientific way of thinking. This makes it very difficult for average people to apply scientific and analytical thinking in their everyday lives.

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That is the main reason for continued ignorance. People want instant answers that they can easily grasp and use immediately, even when they have no basis in fact. Science does not provide quick answers, but it does provide information about the physical world we live in. The scientific community uses a system that best explains how nature functions the way it does.

The challenge for scientists in the near future is to develop methods of presenting science and technology in language easily understood by those less familiar with the scientific method. This might be accomplished through films, books, videos, and CD's, which could help bridge the difference between science and ignorance. At present, most of the difficulties are in the field of communication and education. We recommend *The Demon-Haunted world: Science as a Candle in the Dark* by Carl Sagan to anyone interested in exploring this area.

Scientific individuals present findings without regards to whether people like them or not. Often at the risk of their social standing, careers, or even their lives, they hold fast to such concepts as Earth being neither flat nor the center of the universe, the theory of evolution, and that illness is not punishment by gods or demons. This differs greatly from politicians who seek public approval by catering to the dominant values of the times. We see examples in such emotionally popular matters as family values, nationalism, and religion.

Most churches make people feel guilty about natural human inclinations, making them feel dependent on the church for forgiveness. Religion focuses on unresolved human problems of insecurity, shame, fear, and wish fulfillment, and offers hope for a better life in the next world. Science offers people the tools of reason and knowledge to help build self-reliance and free people from mythology and simple wish fulfillment.

Human beings have the potential to develop their own concepts, and to make their own heaven or hell here on earth. But there is no way for refugees from reality to perceive the actual state of affairs without tremendous effort and inquiry in order to translate their wishes and dreams into reality. It takes honest effort to understand the nature of the world we live in.

Should people turn to science for answers when most are not sophisticated enough to state problems correctly, or even understand the question? Following the path of least resistance in our thinking only holds us back from making more appropriate evaluations in our investigations. This makes it easier to understand how dictators like Hitler succeed in building large followings particularly during hard times.

In seeking simplified answers, people blame social problems on minorities, foreigners, karma, auras believed to surround each individual, acts of demons or gods, or the position of the planets at the time of one's birth, just to name a few. Others seek higher levels of human consciousness and self-realization through meditation. To the uninformed, these things are easily understood because they do not demand proof or verifiable evidence-hence the popularity of metaphysics. Some insist that we return to the simpler life of the past, the "good old days." This is another myth that some people cling to, the idea that things were somehow "better" in times of less technological development.

This is unfortunately a growing phenomenon in the scientifically illiterate world. Even some scientists are persuaded by pseudo-science. Even scientists can be victims of culture. One illustration of this is that some have used their abilities to make weapons of mass destruction with little thought about the consequences.

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The belief that science or religion is not compatible with totalitarianism is a myth. In recent history, in Spain, Italy, Russia, Japan, and Germany, science gave way to sadism, and even practitioners of one of the most ethical professions, medicine, performed gruesome experiments on living people. Churches of nations at war blessed tanks, soldiers, and battleships even when the combatants on both sides were members of the same denomination.

There is really no such thing as a pure scientist, since all data is filtered through our senses personal background, and experience. Some are scientific in their specialized disciplines, but in other areas of science, they may be illiterate. Formulating conclusions outside of one's discipline could even be a violation of the scientific method.

Science should not be used to conquer nature, but rather should point out our interdependence and connectivity to nature, and explore how to utilize our knowledge to live in accordance with the natural order of things. When we as a nation spend nearly five hundred billion dollars annually on defense and only two billion on understanding our environment one must question whether there is actually intelligent life on Earth.

The only hope for developing a new civilization is to accept responsibility for improving our lives through knowledge, understanding, and a deeper comprehension of humanity's relationship to natural processes of evolution. Our future is determined by effort we put forth to achieve this transition.

When we outgrow assumptions about superior and inferior races and realize the unity of humankind and its true relationship with the planet, we will achieve the full potential of science for humane development. This could serve as a unifying global force for achieving a sustainable world.

But not knowing where we are, how can we possibly know where we are headed?

## 5. NEW FRONTIERS OF SOCIAL CHANGE

IN OUR DYNAMIC UNIVERSE ALL THINGS CHANGE, from the farthest reaches of outer space to the movement of continents. Change occurs in both living and nonliving systems. The history of civilization is the story of change from simple to more complex. Human ingenuity and invention are examples of this fact. No system can remain static for long. Unfortunately, changes are not always for the best.

Although we accept the inevitability of change, humans also meet change with considerable resistance. Those in charge, whether religious, military, socialist, capitalist, communist, or tribal, will attempt to hold back change because it threaten their control. Even those oppressed may support a system and the status quo because it is familiar and known. No matter how oppressive one's surroundings, there is comfort in the familiar.

Human civilization is no exception to this process of change. Change occurs in all social systems, and is the only constant. The history of humankind is one of change, which is either brought about by natural circumstances, or by human intervention.

Technology influences the most remote regions of the world almost as fast as it develops. In 1993 Malaysia had interest in banking, construction, credit cards, fast food outlets, medical supplies, and information technologies. The former country of rubber plantations became a high-tech hub.

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Untouched isolated cultures are fast becoming the stuff of history. Although many native peoples still wear ancestral dress, they also carry video cameras and other state-of-the-art electronic devices. These newer technologies are present from Papua New Guinea to Vietnam to China. In Thailand we find Siam Cement, one of the largest cement companies in the world. Some of the most successful cement companies in the world can also be found in Colombia and Peru. In our own country, Disney Information has replaced US Steel with digitally transmitted information.

Yet at every turn, vested interests oppose technological change. Earlier this century, defenders of horse-mounted cavalry delayed development of the tank. So entrenched was this tradition that when Germany invaded Poland in 1939, their Panzers faced Polish soldiers still on horseback.

It was immediately and fatally obvious that the tank had rendered horse soldiers obsolete. Later aircraft development threatened the tank divisions. Pilots and aircraft designers fought the development of guided missiles. The missiles men fought the development of laser weapons.

Similarly, the established social order seeks to perpetuate itself. Those in position of power are able and highly motivated to delay developments that would advance society as a whole.

From the introduction of agriculture some 10,000 years ago until recently – specifically, until the advent of the Machine Age in the late seventeenth and early eighteenth centuries – the rate of change was slow. Social change crept along, accompanied by a great deal of suffering during transitions from one phase of civilization to another. Since the Industrial Revolution, change has accelerated at a fantastic rate. In technologically advanced cultures change occurs rapidly, often too rapidly for the average person to comprehend or adjust to. Even when individuals adjust, institutions such as government, education, medicine, and industry cannot. Their size, their infrastructures, their process, and their missions resist and oppose rapid change.

In just a few decades the transfer of information moved from telegraph to radio, to television, to wireless transmission computers, to satellites that store trillions of bits of data and transmit it to any part of the globe instantly.

We forget that less than forty years ago, a pair of wires could carry a dozen conversations. Twenty years later, one cable carried thirty thousand conversations simultaneously. Today, a single laser beam carries more than a million. This explosion of technology can no longer be stopped.

Whether the citizens of the world are capable of grasping the significance of such change is irrelevant. What is required and of great significance is that a sufficient number of world leaders be able to comprehend development of this magnitude. The degree to which we comprehend such developments will determine our chances of survival.

Technological change occurs less rapidly in lesser-developed countries. Systems and methodologies of some nations have been around for hundreds, or even thousands of years. Small groups of people, such as the headhunters of the Amazon, live in places where their social and physical environment remains relatively static. They still make the same rafts and other tools, using the same techniques as their ancestors did a thousand years ago.

Stagnation is not confined to underdeveloped countries; in developed countries there are large groups who cling tenaciously to the past while the benefits of civilization

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pas them by. But the future is no respecter of the values of today. Generations to come will evolve a set of values unique to their phase of civilization.

While behaviour patterns may remain unchanged for thousands of years in low-technology societies, that people are carbon copies of their predecessors doesn't happen in today's technological world. New generations in different environments require different solutions.

With the advent of the World Wide Web, cybernation, and artificial intelligence, the rate of change is being greatly accelerated. Possibly in the next ten years we will see more change than in all of recorded history. If we as a nation fail to adapt to these changes, others will pass us by. The future belongs to those who meet these challenges.

To be sure, technology evolves at its own rate; one thing triggers another, leading to wider applications. Future technologies will evolve at their own pace, which will be determined by many interrelated factors. If we attempt to alter our social evolution faster than society can adapt to change, there will be severe consequences. Rapid change without proper preparation generates severe problems. Social systems that are unresponsive to people and their environment only increase internal strife.

Common crises create common bonds. While people seek individual advantage during good times, shared suffering draws people together. We see this repeated time and time again throughout the centuries, during floods, famines, fires or natural disasters. When the threat passes, people return to seeking advantage over others.

Motion pictures like Independence Day depict a world united to repel an invasion by a superior hostile alien culture. Indeed, it seems the only force that would unify the world is one that poses a common threat, such as a huge meteor, or some other major catastrophe. In such an event, border disputes would cease and become irrelevant to the impending disaster. While many might call upon their deities to intervene, most nations would unite and use science and technology to solve a common threat. Bankers, lawyers, businessmen, and politicians would be bypassed. Resources for total mobilization would be harnessed without concern for monetary cost or profit. In a threatening situation, most would understand what could best aid their survival.

We currently face many common threats that transcend national boundaries: overpopulation, energy shortages, environment pollution, water scarcity, economic catastrophe, the spread of uncontrollable diseases, and the technological displacement of people by machines, to name only a few. While many are dedicated to alleviating these problems, they will remain insurmountable as long as a few powerful nations and financial interests control and consume most of the world's resources.

Although publications and multi-media paint spectacular pictures of developments to come in areas like transportation, housing, and medicine, they ignore that, in a money-based economy, the benefits go to a relative few. What is not shown is how technologies of the future can be used to organize societies and economies efficiently and equitably so that all may benefit.

Currently, no think tanks are conducting brainstorming sessions on how to align social organization with advancements in technology. No government or industrial group plans for the replacement of people by machines.

Many people believe that in the event of social breakdown the government will ensure their survival. This is highly improbable. In the event of a breakdown, the government would likely declare a state of emergency in an attempt to prevent total chaos. A review of actions taken by governments facing social collapse over the last few decades shows that their primary concern is preserving existing institutions and power structures, even when these are a chief contributing factor to the problem.



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Many people throughout history have wondered why politicians don't act on the people's behalf. The reason is clear when one understands that, even in modern democracies, leaders are not elected to improve the lives of average people, but to maintain the preferential positions of those in the established order.

There are growing indications of awareness on the part of people in various areas of the world that events have gone beyond the control of political leaders. Everywhere we see political figures and parties come and go, and political strategies adopted and then discarded for their inability to satisfy the demands of one faction or another.

There is nothing to be gained from writing your congressman, or any number of governmental agencies, because they lack the necessary knowledge to deal with society's problems. Their focus is on preserving existing systems, not in changing them. There may be a few in today's society who want to phase themselves out, but in modern industrial societies, the cause of inactions is the cumbersome political process itself, an anachronism when decisions can be made on any issue in a split second by the objective entry of data into computers.

Real social change occurs when conditions deteriorate to the extent that governments, politicians, and social institutions no longer relevant or acceptable. Only when the public is better informed or in sufficient pain is it possible to introduce a new social arrangement.

Unfortunately, a majority of people today relate to simplistic answers, which causes the cycle of events to repeat. When faced with intolerable social conditions, many of their conditions (black, Jews, or homosexuals, for instance) or as they seek refuge in religion or supernatural forces.

Significant social changes are not brought about by me and women of reason and good will on a personal level. The notion that one can sit and talk to individuals and alter their values is highly unrealistic. If the person addressed does not have fundamental knowledge of scientific principles and natural laws, it is difficult for them to understand how things fit together on a holistic level.

The solutions to our problems will not come about through the application of reason or logic. We do not live in a reasonable or logical world. There is no historical record of any society that deliberately and consciously modified their culture to fit changing times. The real factors responsible for social change come from biosocial pressures inherent in all social systems. It is brought about by natural or economic occurrences which immediately threaten large numbers of people.

Some of the conditions responsible for social change are limited resources, war, overpopulation, epidemics, natural disasters, economic recession, downsizing on a mass scale, technological displacement of people by machines, and the failure of their leaders to overcome these problems.

Change can come from major technological advances. The introduction of agriculture brought a significant change in society, as did the Industrial Revolution and the introduction of money to the exchange process. From a historical perspective all of these appear positive. At the time of their inception, however, people lost jobs, new skills were required, and entire ways of life disappeared.

The direction change takes is not always for the better, and doesn't always improve the human condition. Change is risky. Deprivation or scarcity that is artificial or real drives the economy. Power-seeking leaders command weapons powerful enough to annihilate entire populations and render our uninhabitable. Humankind's potential for creativity and innovation far exceeds its inclination to destroy, but every few forward.

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History shows that not all change has been beneficial to humanity or to the integrity of the planet's life support systems. For this reason, many desire a return to earlier and simpler times. But it has been demonstrated that any effective, large-scale, and permanent social transformation cannot be achieved through small, cooperative, and hand-tooled economies. Cooperative ventures have been tried throughout history by both religious and secular interests. Most failed to achieve or sustain their goals. The reason for the failure was not human nature or greed. The primary cause was the most participants, although sincere, had little information about the factors responsible for human behaviour.

Although individuals throughout history have proposed many ideal social arrangements – from Plato's Republic to modern Utopian – no industrial nation has ever adopted an arrangement that improved the lives of the people and built a truly civilized nation. This is not difficult to understand when one considers the principles governing most social systems. Government's principles are based on ownership and the accumulation of wealth, power, and property.

Visionaries with sincere intent write and speak eloquently about the world moving forward in unity and brotherhood. Many expect a worldwide epiphany or transformational event. Others expect reason to prevail. Only a very few propose plans to achieve unity, some of which appear incomplete and pose a threat to existing institutions and to national and self-interest: the architects of such plans are often classified as agitators, impractical utopians, and disrupters.

The few bold attempts to achieve world unification failed because movement leaders had no real understanding of the forces shaping social evolution. Significantly, they sought solutions within the framework of the monetary system, never realizing that physical resources – not money – are what matter in the ability of a social system to sustain its people.

Although money helped to eliminate old, cumbersome methods of exchange in a barter system, it is not the final answer. History shows continuing evolution and adaptation. No single answer works for all time, all people, and all problems.

Our social, political, and international order is outmoded today. Outworn social institutions cannot adapt innovative technology to achieve good, nor can they overcome the inequities forced upon so many.

Competition and scarcity instill an atmosphere of jealousy and mistrust among people and nations. Concepts of proprietary rights, manifested in the corporate entity and in the sovereignty of nations, inhibit the free exchange of information necessary to meet global challenges.

Many people fear change and yearn to return to a simpler time of "traditional" values.

Their vision is faulty. Those times were not, in fact, so good. In the first fifty years of that "simpler" time, we waged two world wars. In the intervening years a major agricultural and economic disaster sent millions to soup kitchens and breadlines. If they are honest, it is not the fantasy of the "good old days" that they wish to see realized, but more simplicity.

Our problems today are enormous and global in their scope and impact. They cannot be solved by any one nation. The concept of common good is global in nature, but local in implementation. We cannot hope to backtrack to traditional values which no longer apply. Any retreat into the past would condemn millions to a life of misery, toil, and suffering.

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I am not advocating that these older institutions be overthrown: it is just that they are becoming unworkable. Unfortunately, it will probably take a social and economic breakdown to bring about the demise of the old system and its institutions. At this point, significant social change will probably only occur when a sufficient number of people, through economic failure, lose confidence in their elected officials. The public will then demand other alternatives. While we would like to think that this could usher in a bright new chapter in the human drama, it is far more likely that the most probable course will be a form of dictatorship, perhaps even an American brand of fascism presented to the people as a way of protecting them from the products of their own inadequate culture.

However, it is not enough to point out the limiting factors that may threaten the survivability of all nations. The challenge all cultures now face in this technological age, some more than others, is to provide a smooth transition towards a new way of thinking about ourselves, the environment, and the management of human affairs.

It is now mandatory that all nations engage in the joint venture of planning on a global scale for new alternatives with emphasis on the nature of our social arrangements. This is our only option if we are to avoid a decline of the civilized world. If humankind is to experience mutual prosperity, universal access to resources is essential.

Along with a new orientation toward human and environmental concerns, there must be a methodology for making this a reality. If these ends are to be achieved, the monetary system must evolve into a world resource-based economy. To effectively and economically utilize resources, cybernated and computerized technology must be applied in order to ensure a higher standard of living for everyone. With intelligent and humane applications of science and technology, we will be able to guide and shape our future for the preservation of the environment and ourselves for the generations to come.

It is not enough to advocate the cooperation of all nations. We need a global society based on a practical blueprint acceptable to all. We also need an international planning council capable of articulating the blueprint and the advantages that would result from world unification.

The design must be based upon the carrying capacity of the planet, its resources, and the needs of its inhabitants. To sustain our civilization, we must coordinate advanced technology and available resources with a humane systems approach.

Many professions familiar to us today will eventually be phased out. With the rate of change now taking place, a vast array of occupations will become obsolete and disappear. In a society that applies a systems approach, these professions will be replaced by interdisciplinary teams – systems analysts, computers programmers, operations researchers, and those who link the world together in vast communications networks.

We have the skills and knowledge to apply interdisciplinary teams to problem. But only in times of war or national emergency do we assemble interdisciplinary teams to find workable solutions to social problems. If we mobilize the same resources for social problems as we do during a war, beneficial effects on a large scale can be achieved in a relatively short time. This could easily be accomplished by utilizing universities' training facilities and staffs to best determine different methods to solve problems. This would be an important initial phase to define the parameters for the future of civilization.

The process of social change must allow for changing conditions that continuously update the design parameters, and for the infusion of new technologies into evolving

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cultures. Design teams, using socially integrated computers, can automatically be informed of any changes in conditions.

In this world of constant change, it is not a question of whether we choose to make the necessary changes. Our survival demands that we act on this challenge and accept these new requirements.

## 6.THE INHUMANITY OF A MONETARY-BASED SYSTEM

ALTHOUGH SKILLFUL ADVERTISERS LEAD US TO BELIEVE otherwise, in today's money-based economies the human consequences of introducing new technologies seldom concern those introducing the technology. In a monetary system, the major aim is profit: maintaining the competitive edge and the bottom line is all that matters. The social and health problems that arise from mass unemployment of people rendered obsolete by automation are considered irrelevant, if they are considered at all.

Any social need that may be met is secondary to acquiring a profit for the business. If the profit is insufficient, the service will be withdrawn. Everything is subordinate to increasing the profit margin for shareholders. It does not serve the interest of a money-based society to engage in the production of goods and services to enhance the lives of people, just as manmade laws enacted do not protect the lives of citizens.

All of the world's economic systems – socialism, communism, fascism, and even our free enterprise capitalist system- perpetuate social stratification, elitism, nationalism, and racism, based primarily on economic disparity. As long as a social system uses money or barter, people and nations will seek differential advantage by maintaining their economic competitive edge or by military intervention.

War represents the supreme failure of nations to resolve their differences. From a strictly pragmatic standpoint, it is the most inefficient waste of lives and resources ever conceived. This crude and violent attempt to resolve international differences takes on even more ominous overtones with the advent of elaborate computerized thermonuclear delivery systems, deadly diseases and chemicals, and the threat of sabotage to a nation's computer network. Even when nations desire peace, they usually lack the knowledge to arrive at peaceful solutions.

War is not the only form of violence imposed on people by inadequate social arrangements. There is also hunger, poverty, and scarcity. The use of money and the creation of debt foster economic insecurity, which perpetuates crime, lawlessness, and resentment. Paper proclamations and treaties do not alter the facts of scarcity and insecurity, and nationalism tends only to propagate the separation of nations and the world's people.

A peace treaty cannot prevent another war if the underlying causes are not addressed. The unworkable aspects of international law tend to freeze things as they are. Nations that have conquered land all over the world by force and violence retain their positions of territorial and resource advantage regardless of treaties. Such agreements serve only as temporary suspensions of conflict.

But focusing our efforts on non-productive and non-creative endeavours wastes lives as surely as war. Throughout history we have lived through ages characterized by wasted lives, in which the abilities of a great many have not been fully realized or

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utilized. Time, efforts, and minds are wasted on the pursuit of money in occupations that contribute nothing to the human intellect or condition.

From earliest civilization to the present, most humans have had to work to earn a living. Our attitudes about work may be a carryover from earlier times.

During the thousands of years of monetary system, most workers have been paid just enough to make it necessary that they return to work, even when higher wages have been possible. How else can the wage-payer keep the workers coming back? If the employees received wages that allowed them to work a few weeks and then take time off for a world cruise, an extended vacation, or some other luxuries, production schedules would suffer. Even the highly educated and affluent who live in expensive homes and drive expensive cars have to appear at a place of work if they wish to maintain their standard of living. All of us, even top executives, are slaves of the monetary system. Most of us lack a meaningful existence. We stay at jobs we hate in order to buy more gadgets we don't need, or to build up earned time off so we can escape from the reason we need a vacation in the first place.

In the workaday world, many of us are frantically trying to stay afloat, making payments on cars, homes, and material possessions that enslave the body and mind in an endless attempt to secure our future. Although many take home more money today, inflation has decreased purchasing power for the most people. We are caught up in the game of getting ahead without thinking about what or whom we're trying to get ahead of. Most of us do not take time to think about our own lives and how we relate to one another, or to what and who we really are.

Even those who achieve economic security are addicted to the media's image of personal success. When we achieve our first economic goal, we want more – the cabin cruiser, the vacation house, and the trip abroad. In the monetary world even our dreams are rationed. We start out with "If only I can make a decent living." "If we achieve that, we progress to "If only we had the little house in the country to get away to, then we'd happy". At each successive gain in this endless chain of dissatisfaction, we acquire more and more material wealth, but it's never enough to make us happy. We live in a world of unfulfilled dreams in which we never really come to know or understand what constitutes a meaningful life.

Future people may view our phase of civilization as an age of intellectual and economic insufficiency. They may find it difficult to understand how we accepted aggression and competition as being normal. Some parents attempt to secure the future of their daughters and sons by having them marry into a secure position of wealth. This is a form of prostitution or selling to the highest bidder.

In a monetary system, democracy is an illusion perpetuated to give the populace a feeling of participation in a so-called democratic process. In general, people nominated for public-office are pre-selected by the power elite to serve the interests of the highest bidder. Political parties are an example: a single party representative runs against another party's single representative. The fantasy is that whichever one wins represents everyone in the elections area - regardless of political party or philosophy.

The country's actions and decisions are made by and for major corporations, financial interests, the wealthiest, and the military industrial complex. As long as money and a monetary system prevail, true democracy will be nothing more than an illusion.

We must stop constantly fighting for human rights and equal justice in an unjust system, and start building a society where equal rights are an integral part of the design.

As long as we remain in a monetary system, most people will never have the money to behave democratically. A person may desire a particular type of house and car, but

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lack the means to purchase it. How has this person benefited from the democratic process or the freedom to choose? Yet we claim to have a democratic system that is the best government in the world. In actuality, we are only as free as our purchasing power permits. With money concentrated in the hands of so few, even this freedom is illusory.

Despite its tide and treatment by the media, the Federal Reserve System that controls our currency is not an agency of the federal governments run for the benefit of the public. Rather, the "Fed" is a private institution run solely by and for the private profit. Even the amount in reserve is questionable.

The Federal Reserve, a private institution deceptively named, has enormous influence over our government, its leaders, our personal savings accounts and, to a large extent, how many of us will have jobs. The Federal Reserve, not the government, has complete control over the lending of money. It sets interest rates thereby wielding tremendous political influence.

But the Federal Reserve System is not the only private institution that manipulates our economic system. Banks use a process called "fractional reserve banking" which enables them to loan more than they have on deposit to cover the loans. They then charge interest on money they don't have. Through this process, banks lend out at least them times more than they have on reserve, which reduces the value of money and leads to inflation. It is no wonder the newest and biggest buildings in cities belong to banks. If we behaved like banks, we would be charged with fraud.

This is not a new practice. In 1881 James Garfield stated, "Whoever controls the volume of money in any country is absolute master of all industry and commerce. And when you realize that the entire system is very controlled one way or another by a few powerful men at the top, you will not have to be told how periods of inflation and depression originate."

Private money lenders understood early on the overwhelming benefits of lending money to nations at war when the paybacks were assured by the taxing of their people. This was much more profitable than lending to individuals. Financial interests and corporations instigate wars and other disruptions to this day.

The monetary system avoids crisis from the lack of purchasing power of individuals and small companies by propping up the economy with military expenditures, corporate welfare, and funds for research by private industries. The government borrows money from private lending institutions to help support the economy in these areas. This increases the national debt while directing the public's attention away from national problems such as cutting expenditures from the Veteran Administration cutting aid to the poor, education, environmental concerns, etc. In many instances, our government and corporations use our own military equipment and force to put down revolutionary social changes elsewhere in the world, while generating an illusion of prosperity at home.

Amschel Rothschild, one of the early beneficiaries of the private banking system, stated, "Give me the power to issue and control a nation's money and I care not who makes its laws." As it is applied today, financial power is truly amoral.

A truly democratic system works only when all people have access to the same opportunities for individual development and economic growth. This is not the goal of a monetary-based system.

In a free enterprise system, people who design and build a ski resort don't submit the design to a vote in which all participate. Instead, they submit it to the demands of the market, that is, those who can afford to ski. If they offer enough of the amenities that skiers want and can afford, their resort succeeds. A successful system should cater to the

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needs of all people. There are many people who would like to ski who can't afford to. Choices are limited to what a certain group of people can afford. This is elitism.

Whenever money is involved, there is elitism. Those who control purchasing power have far greater influence.

Many years ago, the American people were taxed to build roads for automobiles. They did not vote for this development. The automobile and bus industries, real estate lobbies, and the military greatly influenced the development of freeways and roads because of the potential for automobile transportation systems that were far cleaner, more efficient, and more economical than automobiles, but these were sold and dismantled by vested interests representing the automobile industry.

We now have a transportation that is so expensive that many cannot afford to participate. For what and for whom has democracy worked in this case? Millions of Americans are taxed for highways which they do not benefit from and which have proved dangerous, inefficient, and expensive as a means of transportation.

In our present monetary system, private institutions hoard a great deal of useful knowledge rather than making it available to the world's population. In an increasingly proprietary and commercial world, in which even college professors copyright the notes from their lectures, there is a disturbing shift from the spirit of the pioneer to that of the salesman.

Several companies recently submitted and received patents on the genome of two men immune to AIDS. The companies neither created nor own the genetic material, not did they discover it independent of the living bearers of those genes. But they acquired patents on genes in living humans. Is this democracy in action? At this writing one of the men has threatened legal action. Rather elevating the human condition, the scientist increasingly morphs into the businessman, auctioning his benefits to the highest bidder. For this reason, much new technology is in the control of private institutions rather than in the public domain.

Many heroes from the past are honoured for their self-sacrifice in attempting to make the world a better place. Thousands have sacrificed their lives for others. These people often acted as they did without thought for monetary rewards.

The big lie perpetuated by those in control of the money system is that only competition generates incentive. This system is said to provide employment and incentive, but it also produces greed, corruption, crime, embezzlement, etc. For centuries, governments have directly and indirectly programmed their subjects with value systems that perpetuate their control. They have used the human mind as a dumping ground for their own values and concepts, and encouraged behaviour patterns that generate feelings of guilt at any departures from the values of the established system.

At the same time these control groups have stifled development of individuality by fostering compliant populations who lack the information and insight to question, "Where, exactly, do my values come from?"

The monetary system places a tremendous unnecessary strain on available resources, and denies the benefits of mass production to countless millions of people. In a monetary-based society, profit depends on maintaining an artificial scarcity of goods and services and/or the conscious withdrawal of efficiency.

Rather than designing automobiles to last for many years, manufacturers waste tremendous amounts of energy retooling for yearly changes to compete for market share with others producing machines that serve exactly the same function. A recent military survey of commercial catalogs identified over 300 types of wrenches differing

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so slightly that many were interchangeable. While a wrench is a useful tool, what purpose is served by over 300 minimally-varying models? Tremendous waste of materials and resources comes from each company doing unnecessary and redundant paper work, advertising, manufacturing, etc.

Another example can be seen when someone address the nation on television. The viewer will see dozens of different microphones, each representing a competing media-group, when only one or two are necessary to report the event throughout the world. Consider also the fashion industry, where clothing is constantly changed in order to induce people to purchase the newest latest fads.

In the United States during periods of the "price warn", milks and other agricultural products were destroyed to maintain higher price levels. Where is the outrage? We buy into the "virtue" of work while we allow its products to be destroyed. Equally damaging is planned obsolescence where industries deliberately create products that break and require replacement or unnecessary repairs.

In the aircraft industry sales of large transport aircraft are not the major source of profit. Large profits come from maintenance and the replacement of parts. This is particularly so within the military with its dependence on the market. Vendor changes affect costs far more than changes in mission. During World War II many anti-aircraft guns and armaments were manufactured with parts that were not interchangeable. The parts from one company would not fit the guns of another.

Today Congress pushes the Defense Department to "save money" by purchasing commercial off-the-shelf equipment. On the surface buying already available equipment, rather than developing military-specific equipment, appears sensible. But military equipment must be interoperable as well as supportable all over the world, and in environments that commercial equipment seldom encounters. Personal computers sent with troops for Desert Strom, for example, failed by the hundreds because of excessive heat and sand encountered in Kuwait. Instead of buying parts for a single model, the military now must accommodate multiple vendors and their equipment, parts, and tools. Our tax money flows far outside government channels. This should surprise non one. A review of the annual defense budget finds numerous examples of Congressionally-mandated purchases of equipment and services that are of no use to the military. So in addition to your personally buying goods that keep companies in business, your taxes go to them as well.

Over a half century ago, the United States Electric Light Company gave its dynamic inventor Hiram Maxim a twenty thousand-dollar annual life pension and exiled him to England. They needed to get rid of him because he kept inventing improvements. His creative ability made their equipment obsolete before they had time to pay for it.

Unfortunately for the U.S., Maxim produced some of his greatest inventions in England. At the same time he was being knighted for outstanding accomplishments, the United States Electric Light company was going out of business. Today in Japan, the shelf life of electronic equipment before obsolescence is approximately three months.

A money system has existed for centuries and, whether we realize it or not, has always been used to control the behaviour of those with limited. It is only when resources are scarce that a monetary or barter system can function.

In other words, if a person wants goods and services, he or she is obliged to submit to the control of others. When a person goes to work in industry today, he or she enters a private dictatorship from the moment they punch the time clock to the time they leave the premises.



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We are overdue for a serious examinations and radical overhaul of one economic system and ideologies. Attempting to find solutions to the monumental problems within our present society will only serve as temporary patchwork, prolonging an obsolete system. Our advantages came from being isolated from hostile neighbouring countries, our wide range of natural resources, our fertile land, and the many contributions of inventors and engineers who developed our production technology.

## 7.WHEN MONEY BECOMES IRRELEVANT

IN THIS CHAPTER WE DISCUSS a straightforward approach to the redesign of culture, in which war, poverty; hunger, debt, and human suffering are viewed as not only avoidable, but totally unacceptable. This new social design seeks to eliminate the underlying causes of our problems, but they can't be eliminated within the framework of the present monetary and political establishment.

The major corporations' first concern is profit. This narrow concern will ultimately result in the demise of our economic system. If the monetary system continues, we face ever-increasing technological unemployment as seen in downsizing. We need fewer people with greater skills to support production. Everyone else becomes irrelevant except as consumers. It is only a matter of time before automation replaces people in almost all areas, resulting in a lack of purchasing power to buy the goods turned-out. Even in an expanding market, this will bring about massive and unmanageable problems.

During the 1930's at the height of the Great Depression, the Roosevelt administration enacted new legislation designed to minimize revolutionary tendencies and to address unemployment by providing, jobs, through the WPA, CC Camps, NRA, transient camps, and federal arts projects. Ultimately, however, it was World War II that pulled the U.S. out of that worldwide recession. If we permit current conditions to take their course, we will soon be faced with another international recession of even greater magnitude.

At the beginning of the World War II, the U.S. had only 600 first class fighting aircraft, but we rapidly increased production to 90,000 planes per year. Did we have enough money to pay for the implements of war? No, there was not enough money or gold, but we did have more than enough resources. Available resources and personnel – not funding – provided the production and efficiency required to win the war.

We live in a culture that seems to work collectively only in response to a crisis. Only in times of war or national disaster do we move beyond money and apply the necessary resources and interdisciplinary teams to meet a threat. Rarely, if ever, do we employ concerted efforts to find workable solutions to social problems.

If we applied the same efforts of scientific mobilization toward social betterment as we do during a war or disaster, large-scale results could be achieved in a relatively short time. More time and effort must go into the collection of experimental evidence to support innovative social arrangements.

The Earth is abundant with resources our practice of rationing resources through monetary methods is irrelevant and counterproductive to the well-being of people. Modern society has highly advanced technologies and can easily provide more than enough for a high standard of living for all by implementing a resource-based economy.

Simply stated, a resource –based economy uses existing resources rather than money, and provides an equitable distribution of goods and services in a humane and efficient manner for the entire population. It is a system in which all natural, man-made,

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and synthetic resources are available without the use of money, credit, barter, or any other form of debt. A resource-based economy uses resources from the land and sea, physical equipments, and industrial plants to enhance the lives of the total population. In an economy based on resources rather than money, we can easily produce the necessities of life and provide a high standard of living for all.

In a resource-based economy the world's resources are held as the common heritage of all people, eventually outgrowing the need for artificial boundaries that separate people. This is the unifying imperative.

We must emphasize that this approach to global governance has nothing whatever in common with the present aims of an elite to form a world government with themselves and large corporations at the helm, and the vast majority of the population subservient to them. Our vision of globalization empowers each person on the planet to be the best they can be, and to not live in subjugation to a corporate governing body.

All social systems, regardless of political philosophy, religious beliefs, or social customs, ultimately depend upon natural resources, including clean air and water, arable land, and the technology and personnel to maintain a high standard of living. This can be accomplished through the intelligent and humane application of science and technology. The real wealth of any nation lies in its developed and potential resources, and the people who work toward the elimination of scarcity and the creation of a more humane society.

The use of large-scale computer-based systems will assist in defining the parameters of a resource-based economy, and all construction projects will conform to environmental requirements. Over-exploitation will be unnecessary and surpassed. As of this writing, NASA has announced the use of a powerful parallel supercomputer to evaluate the global impact of national and human-induced activities on climate.

A resource-based economy would use technology to overcome scarce resources and utilize renewable sources of energy. It would computerize and automate manufacturing and inventory and design safe energy-efficient cities while providing universal health care and better education. It would generate a new incentive system based on human and environmental concerns.

Unfortunately, science and technology have been diverted from these ends for reasons of self-interest and monetary gain through planned obsolescence, sometimes referred to as the conscious withdrawal or efficiency. It is an irony that the U.S. Department of Agriculture, whose function is to conduct research into ways of achieving higher crop yields, actually pays farmers not to produce at full capacity while many go hungry.

We place signs next to a highway saying "Caution Slippery When Wet," when a more effective approach would be to design roads with abrasive strips that would not be slippery. We "purify" water systems by dumping chemicals into them, despite their continuing build-up. There is a problem of dumping waste into rivers and waterways because it is cheaper than more responsible disposal methods. Industries fail to install electrostatic precipitators at their plants to prevent particulate matter from being released into the atmosphere from industrial smoke-stacks, when that technology has been available for over 75 years. The monetary system does not always apply known methods that would best serve people and the environment.

In our search for more, we have blinded ourselves to our personal responsibility for challenging these absurdities. A resource-based society considers us all equal shareholders of Earth. We are responsible both for the planet and for our relationship with each other.

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In a resource-based economy, the human condition is of prime concern with technology subordinate. In such an economy, production is accomplished totally by machines and the products are available to all. The concepts of "work" and "earning a living" become irrelevant. The focus is on having a life. In a money economy, when the human consequences of automation are neglected, it renders the advances of science and technology meaningless except to a select few.

To better understand a resource-based economy consider this: if all the money in the world suddenly disappeared, but topsoil, factories, and other resources were left intact, we could build anything we chose to build and fulfil any human need. It is not money that people need, but access to the necessities of life without having to appeal to a government bureaucracy or any other agency. In a resource-based economy money is irrelevant. What's required are the resources and manufacturing and distribution of the products.

In a monetary system, purchasing power is not related to the capacity to produce goods and service. For example, in a recession there are computers in store windows and automobiles in car lots; but people do not have the purchasing power to buy them. The rules of the monetary system are obsolete and create needless strife, deprivation, and human suffering.

In today's culture of profit we do not grow foods based on demand, nor do we practice medicine solely to cure diseases. Industry's major motivation is profit.

Consider the automobile. To service conventional automobiles we must remove a lot of hardware before we get to the engine. Why are they so complicated? Simply because ease of repair is not a concern of the manufacturers. They do not have to pay to service the car. An entire subset of the automotive industry is devoted to making a profit from the repair of cars and trucks. If manufacturers were responsible for the cost of repairs, cars and trucks would be built very differently, with different materials, enhanced performance, and modular components easily disengaged for getting at the engine.

Such construction would be typical in a resource-based economy. Many of the components in the automobile would be easily detachable to save time and energy in the rare cases of repair, because no one profits from servicing automobiles or any other products. Quality, simplicity of servicing, and technological upgrade would be primary design drivers. Eventually, through the development of magnetically suspended bearings, lubrication and wear could be eliminated entirely. There will also be proximity devices on all vehicles to prevent collisions. Automotive transport units engineered in this way would be service-free for many years.

This same thinking would be applied to all products. Industrial devices would be designed for recycling, but there would be much less recycling when we build household material and products of superior quality designed not to wear out or break down.

A resource-based world economy would involve all-out efforts to develop new clean and renewable sources of energy: geothermal, controlled fusion, solar, photovoltaic, wind, wave, and tidal power – even fuel from the ocean. We would eventually have energy in unlimited quantity that could power civilization for thousands of years. A resource-based economy must also redesign cities, transportation systems, and industrial plants, making them energy efficient, clean, and able to serve the needs of all people.

Shipping and transportation systems would maintain a balanced load economy, being fully utilized in both directions of travel. There would be no empty trucks, trains, or transport units on return trips. There would be no freight trains stored in yards dependent on the business cycle for their use.

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What else would be a resource-based economy mean? Technology, intelligently applied, conserves energy, reduces waste, and provides more leisure time. With automated inventory on a global scale, we can balance production and distribution. Planned obsolescence would be unnecessary and non-existent in a resource-based economy. Packaging systems would be standardized, requiring less storage space and easy handling. Nutritious and healthy food would be available.

To eliminate waste from impermanent products such as newsprint, books, and magazines, a light-sensitive film can be placed over a monitor or TV to produce a temporary printout of the news or other information. This material will hold the information until it is deleted. This would conserve millions of pounds of paper, and be a major part of the recycling process. Eventually most paperwork, including the transfer of money, would be eliminated.

As we outgrow the need for professions based on the monetary system, such as lawyers, bankers, insurance, agents, advertisers, salespersons, and stockbrokers, a considerable amount of waste will be eliminated. Considerable amounts of energy would be saved by eliminating the duplication of products such as tools, eating utensils, pots, pans, vacuum cleaners, and those 300 wrenches mentioned earlier. Choice is good. But instead of hundreds of different manufacturing plants and all the paperwork and personnel required to turn out similar products, only a few of the highest quality would be needed to serve the entire population.

Our only shortage is a lack of creative thought and intelligence in ourselves and our elected leaders to solve these problems. The most valuable untapped resource today is human ingenuity. With the elimination of debt, fear of losing one's job will no longer be a threat. This, combined with education on how to relate to people in a more meaningful way, could reduce mental and physical stress, leaving us free to explore and develop our abilities.

If the thought of eliminating money still troubles you, consider this: If a group of people with gold, diamonds, and money were stranded on an island that had no resources, their wealth would be irrelevant to their survival. It is only when resources are scarce that money can be used to control their distribution. One could not, for example, sell the air we breathe or water abundantly flowing down a mountain stream. Although air and water are valuable, in abundance they cannot be sold.

Money is only important in a society when resources for survival are rationed and people accept money as an exchange medium for the scarce resources. Money is a social convention, an agreement if you will. It is neither a natural resource nor does it represent one. It is not necessary for survival unless we have been conditioned to accept it as such.

## WHAT WILL MOTIVATE PEOPLE?

Some people claim the free-enterprise system and its competition create incentive. This is only partially true. It also creates greed, embezzlement, corruption, crime, stress, economic hardship, and insecurity. Most major developments in science and technology resulted from the efforts of very few individuals, working independently and often against great opposition; Goddard, Galileo, Darwin, Tesla, Edison, Einstein, etc. These individuals were genuinely concerned with solving problems and improving process, rather than with financial gain. Despite our belief that money creates incentive, we

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seldom trust those whose sole motivation is monetary gain. This can be said about doctors, lawyers, entertainers, and those in just about any field.

If basic necessities are available, what will motivate us? Quite simply, the things we care about. Children reared in affluent environments in which food, clothing, shelter, nutrition, education, and much more are provided still demonstrate incentive and initiative. On the other hand, overwhelming evidence supports the idea that malnutrition, unemployment, minimum wages, poor health, lack of direction, lack of education, homelessness, no appreciation of one's efforts, poor role models, poverty, and bleak prospects for the future can and do destroy incentive and the drive to achieve.

One aim of our new social design is to encourage a new incentive system that is no longer directed toward the shallow and self-centered goals of wealth, property, and power. These new incentives would encourage people toward self-fulfillment and creativity, the elimination of scarcity, the protection of the environment, and, most of all, concern for their fellow human beings.

The air we breathe, clean water, sunshine, forests, and nature, for the most part, support life without charge. With good nutrition in a highly productive humane society, people will evolve a new incentive system. Without the need to work just to survive, there would be enough new things to explore and invent that the notion of people sitting around doing nothing seems absurd. The lack of incentive we see in our present culture happens when people dare not dream of a future that seems unattainable.

Each phase of social evolution creates its own incentive system. In primitive times, an incentive to hunt for food was generated by hunger; the incentive to create a javelin or a bow and arrow evolved as a process to support the hunt. With the advent of the agrarian revolution, the motivation for hunting was reduced, and incentives shifted to the cultivation of crops with supporting implements, the domestication of animals, and protection of personal property. In a civilization where people receive food, medical care, education, and housing, incentive will again change appropriately. People will be free to explore other possibilities and lifestyles that were not anticipated in earlier times.

The nature of incentive and motivation depends on many factors. We know, for example, that an individual's physical and mental health directly relate to their level of motivation and productivity. We are also known that healthy babies are naturally inquisitive. In India and other areas of great scarcity, many are motivated against the accumulation of wealth and material property, and they renounce worldly goods. Under those conditions this may not be too difficult. This contrasts with the western culture's emphasis on the accumulation of material wealth. Yet which is more valid? Your answer to this question depends upon your culturally determined value-system.

Some people overcome the shortcoming of their environment despite a lack of positive reinforcements. They provide their own "self-reinforcement," are able to see improvement in whatever they are engaged in, and achieve an intrinsic sense of accomplishment. Their self-reinforcement does not depend on the approval of others. Children who do require the approval of a group tend to have low self-esteem. Children who do not depend on group approval acquire a sense of self-esteem by improving their performance.

Throughout history many innovators, artists, and inventors have been ruthlessly exploited, ridiculed, and abused while receiving very little financial incentive. Yet they endured such hardship because they were motivated to learn and to discover new ways of doing things. On the other hand, Leonardo da Vinci, Michelangelo, and Beethoven (to name a few of history's most creative minds) received the generous sponsorship of

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wealthy patrons. But this did not kill their incentive in the least; on the contrary, these individuals strove to reach new heights of creativity, perseverance, and individual accomplishments. Creativity is often its own motivation.

This is a difficult concept to grasp because most of us have been brought up with a set of notions about the way we “ought” to think and behave. These are based upon ancient ideas that are irrelevant today. Some primitive cultures on remote islands in the South Pacific have access to all the food they require, and also to clean water and air. There is probably no question that most of them are better adjusted than many in the so-called civilized world. There is no evidence demonstrating that unlimited access to the necessities of life diminishes incentive.

It has often been said that war spurs creativity. This deliberately falsified concept has no basis in fact. It is the increased government financing of war industries that helps develop so many new materials and inventions. There is no question a saner society would create a more constructive incentive system if our knowledge of what shapes human motivation were applied.

Experimental psychologists have shown that environment plays a major role in shaping behaviour and values. If constructive behaviour provides appropriate rewards during early childhood, then a child is motivated to repeat the rewarded behaviour, provided the reinforcement meets the individual needs of the child. For example, a football given to a child whose interest is botany and not football would not seem like a reward from the child's point of view. It is unfortunate that many individuals in society today are not rewarded for creative behaviour.

In a resource-based economy motivation and incentive will be encouraged through recognition of, and concern for, the needs of individuals. This means providing the environment, educational facilities, good nutrition, health care, love, and security that people require.

## LOVE AND EXTENSIONALITY

For centuries “love” has been a dominant word in our vocabulary. The definition varies so much today that the word has become almost meaningless. Love is subject to many different interpretations, most of them irrelevant to the behaviour associated with it. Perhaps the word “love” may one day be redefined in more relevant terms, such as our being extensional to one another. What is being extensional? Our arms and hands enable us to pick up and rotate objects, and to view them from many different positions. Our arms and hands are extensional along with our eyes, ears, nose and the rest of our physical body.

When a Single individual builds a log, cabin, it may take a long time to complete. With the help of several neighbours, the job can be completed in a short amount of time. The neighbours become extensional to this individual. The same is true of an entire community that acts in a supportive manner towards each another.

In the physical sciences, a structural engineer must work with a metallurgist to improve the strength and quality of structural materials. The two and their skills, their teamwork, are genuinely extensional. The physical sciences are the closest approach to genuine extensionality. Rather than being directed at a single individual, genuine extensionality serves all people equally. For instance, when contaminated water is purified, it benefits any person who uses the process. Vaccinating children to prevent disease is not only extensional to the individual, but also to almost everyone else with

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whom they are in contact. Identifying conditions responsible for a disease is extensional and beneficial to all people regardless of their personal values and philosophy.

When different nations share technology intelligently, it is extensional to all people regardless of independent beliefs and national interests. Corporate systems, however, chiefly benefit owners and shareholders. When inventions serve of all people, they will truly be extensional.

Knowing the difference between governments and people who merely verbalize good intentions, as distinct from those who display actual extensionality, is essential to advancing civilization both physically and intellectually.

When a bank lends money to an individual, there is a benefit but it comes at a cost called debt and obligation. Genuine extensionality does not exact a toll. Extensionality at its most basic is an act of kindness one does without debt being incurred by the other person.

The more people become extensional to one another, the richer the civilization and the interaction between individuals become. In the future instead of asking, "Do I love this person?" one might identify the specific areas of extensionality that one shares with them.

## **WOULD ALL THE PEOPLE IN SUCH A CYBERNATED SOCIETY BE UNIFORM?**

Yes, in some way they would. For example, everyone would understand the importance of extending maximum courtesy to all nations and to one another. They would share an intense curiosity for all that is new and challenging. With better understanding people could possess a flexibility of outlook unknown in previous times, free of bigotry and prejudice. In addition, the people of this new society would care for their fellow human beings and about the protection, maintenance, and stewardship of Earth's natural environment. Everyone, regardless of race, colour, or creed, would have equal access to the amenities this innovative culture could supply.

## **SOMETHING FOR NOTHING**

Some people question the morality of receiving something for nothing. Once when I was speaking at a college, a student expressed opposition to the idea of getting something for nothing I asked if he would answer a personal question. When he replied, "yes", I asked him, "Are you paying your way through school or are you parents?" He admitted his parents were. I pointed out that if he really did believe people should not receive something for nothing, then in the event of death, he would prefer his inheritance go to the heart or cancer fund, rather than to him. Needless to say, the student was opposed to this idea. Just by being born in a developed country, we get many things for nothing, such as the telephone, the automobile, electricity, and running water. These gifts of human ingenuity and invention do not degrade our lives, but rather enrich us. What degrades us is our lack of concern for those unfortunate enough to experience poverty, hunger, lack of medical care, and war. The social designs that are proposed in this writing merely provide an opportunity for individuals to develop their fullest potential in whatever endeavour they choose, without the fear of any loss of individuality.

## **WHAT GUARANTIES PEOPLE THE RIGHT OF PARTICIPATION?**

The reason for corruption is someone getting something they consider valuable out of an act. Without vested interests or the use of money, there is little to be gained by squelching opinion, falsifying information, or taking advantage of someone. There are no underlying rigid social barriers to limit the participation of someone or to restrain the introduction of new ideas. The objective is full access to information, goods, and services for all, a state of affairs that will enable people to participate in the exciting challenges of this new society.

## **HOW WOULD RESOURCES BE DISTRIBUTED EQUITABLY IN A RESOURCE-BASED SOCIETY?**

Distribution of goods and services without the use of money or tokens would be accomplished through the establishment of distribution centers. The distribution centers would be similar to expositions where the advantages of new products could be explained and demonstrated. For example, if you visited Yellowstone National Park you could check out a camera or camcorder, use it, and then return it to another distribution center or drop-off, eliminating storing and maintenance.

Besides computerized centers throughout communities where products will be displayed, there will be 3-D, flat-screen imaging capabilities in each home. If you desire an item, an order can be placed and the item automatically delivered directly to your residence. Raw materials for the manufacture of products can be transported directly to manufacturing facilities by automated transportation "sequences" such as boats, monorails, mag-lev trains, pipelines, and pneumatic tubes. An automated inventory system can be connected to the distribution centers and evaluation of preferences and consumption. In this way, a balanced-load economy can be maintained. Shortages, overruns, and waste could be eliminated.

## **IN CONCLUSION**

In contrast to today's National Security mania for intruding on everyone's privacy, in a resource-based economy, no one need take from another. It will be socially offensive and counterproductive for machines to monitor the activities of human beings but, more to the point, there will be no reason for it. A main purpose of this new social arrangement is to create an environment that will encourage the widest range of individuality, creativity, constructive endeavour, and cooperation, without any elitism, technical or otherwise. Significantly, a resource-based economy would generate a far different incentive system, one based on human and environmental concern. This would be, not be a uniform culture, but one in a constant process of growth and improvement.

It also anticipates the stabilizing of the world's population through education until the population coincides with Earth's carrying capacity. When population exceeds the capacity of the land many problems such as greed, crime, and violence emerge.



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As we enhance the lives of others, protect our environment, and achieve abundance, our lives can become richer and more secure. If these values were put into practice, we could achieve a much higher standard of living within a short period of time, one that would continuously improve.

In the society of the future, when the monetary system and scarcity are replaced by a resource-based economy and most of our needs are met, private ownership as we know it will cease. The concept of ownership would be of no advantage in a high-energy society.

Although this is difficult for many to imagine, even the wealthiest person today would be better off in a high-energy, resource-based society. Today's middle class live better than kings of the past. In a resource-based economy, everyone would live better than the powerful and wealthy of today.

People would be free to pursue whatever constructive field of endeavour they chose, without the economic pressures, restraints, and taxation that are inherent in the monetary system. By constructive endeavour, we mean anything that enhances the lives of the individual and others. When education and resources are available to all without a price tag, there will be no limit to human potential. With these major alterations, people will live longer more meaningful and healthier lives. The measure of success would be fulfilling one's individual pursuits, rather than acquiring wealth, property, and power.

This proposal is not Utopian or Orwellian, nor does it reflect the dreams of impractical idealists. Instead, it offers attainable goals requiring only the intelligent application of what we already know. The only limitations are those which we impose upon ourselves.

## **8.THE NEXT PHASE OF EVOLUTION: MACHINE INTELLIGENCE**

### **WELCOME TO THE AGE OF AUTOMATION AND AI**

AUTOMATION IS A MAJOR PART OF OUR LIVES. By replacing human labour and intelligence with machines, we achieved a standard of living unknown even to royalty in past times. Automation and its recent partner, cybernation, or the wedding of the computer to production, has unleashed an outflow of goods and services never before experienced. The next step, underway now, adds artificial intelligence (AI), computer programming that simulates human decision-making and hypothesis testing, along with self-correction. AI redesigns mechanical and electronic system to stimulate and improve upon human performance. As exciting as these developments are, they are only the beginning.

The way we conduct human affairs is being challenged by the use of computers. The Internet and the World Wide Web are providing the groundwork for the evolution of a new social direction in human interaction, bringing together vast stores of information from many different disciplines.

From the comfort of our homes, schools offices, and libraries we are now able to instantly access a world of information on the World Wide Web, interacting with people throughout the world. Electronic mail and messaging systems reach Australia as quickly as the office next door. This extremely rapid and easy communication process changes

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radically how we relate to each other and how we conduct business. Information flows across the net ignoring customs, borders, and international agreements. To those wedded to the control of information, these are terrifying times.

Developments in nanotechnology and replication offer humanity the opportunity to command its destiny to a degree never before achieved. We can overcome scarcity once and for all, and virtually eliminate poverty, unnecessary human suffering, deprivation, and perhaps even the need for work. Where will this lead us? Will human beings eventually be replaced by the efficiency of machines? What will we do? How will we make a living?

As some fear, will machines enhanced with artificial intelligence eventually take over? Will people become obsolete?

In this chapter we probe the possibilities of the future of automation – its promise and its dangers. Keep in mind that these mechanical children can so far do only what we humans program them to do. For all their sophistication, they have none of our ambitions or failings, nor are they likely to. It is, therefore, our decision whether we use them to elevate people everywhere, or to serve our fears, prejudices, and power seeking. Therein lies our future, and the future of our technology.

For the first time in history, we have the information necessary to take charge of our own destiny. We are also fully responsible for the decisions we make and their consequences. Do we have the capacity, the will, and the intelligence to clearly think out and implement changes for our overall benefit, or will we wait for some catastrophic event to direct the future?

For society to improve the quality of life for people, it must overcome the rigidity of the present. Science and technology undergo continuous modification and revision, but social customs, values, and more tend to remain fairly static. If the outmoded, unquestioning, and emotion-driven methods used by our government and economic systems today had been applied to the sciences, we would have made very little technological progress.

The greatest fear people have about the coming age of cybernation is that millions will be left behind, unable to adjust to, or understand the way the new culture operates. In fact, some people do fall behind or are slow to catch up during times of change. Most of us do not understand the science and technology behind the products we already use. Fewer and fewer of us work on our cars. Not many people repair their own computers, refrigerators, or TV's. We don't have the training, the tools, or the time to do so. But one interesting aspect of emerging technologies is that you do not need understanding to use it. The human interface portion is so basic that former third world nations have easily made the jump from horse-drawn plows to computers, and many are now leading developers of software.

The history of invention includes all systems that enabled human beings to improve communication beyond the first primitive grunts. Books, radio, television, and all other forms of human communication extended our relationship to others, and added to our range of consciousness. The computer, like all other inventions, serves as an extension of human consciousness, a brain outside of our bodies, yet connected to our nervous system, the world, and eventually the stars. The developments of the computer, World Wide Web, and the Internet, have liberated users from many of the limitations imposed on them by governments. It is no longer easy for nations to shield their citizens from controversial ideas.

Although we are at early stages of the Internet, a threat to this new unintended liberator is the attempt to control the input and output of information. Some already

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seek limitations on material regarded subjectively as being objectionable. Once established, such control may be gradually extended to all areas that might threaten an existing power structure. The conditions that perpetuate these threats may not be a direct conspiracy, but the result of thousands of self-appointed guardians of the status quo.

Eventually, all social systems must extend beyond current boundaries and ethnic groups to achieve a linkup in order to arrive at as long-term, sustainable future for generations to come. Soon most people will realize that a cybernated society may benefit humanity more than any other development in history. Here we do not contemplate the use of technology to advance the interests of transnational corporations, but to organize a global economy based on human rights and basic human needs. This new world of humans plus computer-generated solutions can provide us with global strategies that constitute a joint venture in problem-solving for the benefit of all Earth's inhabitants.

Automated machines today can perform almost any task that humans can. While we have only two hands, machines have been designed that far exceed the manipulative ability of any human. As far back as 1961, U.S. industries announced that they had developed the first general-purpose automation machine at a price of around \$ 2,500. It was called the TransfeRobot. Its swinging arm and hand were infinitely superior to any human arm or hand. It never got tired and the electronic brain guiding it was nor prone to inattention. It picked things up and put them down within an accuracy of two thousandths of an inch. In 1961 the Westclox Co. of LaSalle, Illinois used the TransfeRobot to oil clock assemblies as they sped by on a conveyor belt. It oiled eight precision bearing a second.

Interestingly, the same year a U.S. Senate subcommittee on technology and automation observed that, considering the extent of automation, the amount of goods and services required by the entire country could be provided by ten percent of the work force that existed at that time. Ninety percent of the workforce no longer provided critical goods and products. Essentially, then, as long ago as 1961, 90% of the workforce toiled for non-essential goods and services. So-called "service industries" work, related to controlling and managing money, replaced producing food and clothing.

The advent of cybernation can be regarded as the real emancipation proclamation for humankind if used humanely and intelligently. Cybernation could enable the highest conceivable standard of living with practically no labour. It could free people for the first time from a highly structured and outwardly imposed routine of repetitive day-by-day activity. It could permit one to actually live the Greek concept leisure, where slaves did the work and citizens cultivated their minds. The difference is that in the future, each of us will command more than a million slaves, but they will be mechanical and electrical slaves. That will forever end the degrading use of one human being to do, against their will, the work of another. Perhaps the greatest aid for enhancing the survival chances of the human race is the electric computer and artificial intelligence, which may well save the human race from its own shortcomings.

As we begin to plan for a new human society, we need to foster common values about clean air, water, and other elements of self-sustenance. These, along with a complete inventory of Earth's resources, will form the basis for a holistic approach to cybernated decision-making. Any changes recommended by cybernated systems can also provide information on the effects that innovative systems will have holistically on the entire system. This is not a project for the distant future. Some of this work is already under way.

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The father of cybernation, Dr Norbert Wiener, had this to say about the emerging age of non-human work: "It is a degradation to a human being to chain them to an oar and use them as a source of power, but it is almost an equal degradation to assign them to purely repetitive tasks in a factory which demands less than a millionth of their brain power." What dreams, what goals will we be able to achieve when we have the time to pursue them?

## DEMISE OF THE MONETARY SYSTEM

Government and industry will continue to assign more and more responsibility for decision making to intelligent machines. Today's machines handle trillions of bits of information per second, far more than any number of industrial or political decision-makers can handle. They can also constantly process and update information.

The other side of this trend is that people will be replaced, so that they will no longer have the purchasing power needed to sustain a monetary system that burdens the population and government with insurmountable debt.

As the old monetary system displaces more people with automation, they will cease to respect the authority of industry. The time-honoured patterns of living in industrial countries, where people balance work and family, will become impossible for the majority as they are displaced by automation.

When automation and cybernation reach their fullest potential, not only industrial workers, but also most professionals will be replaced. It may surprise people when life-like computer-generated images replace actors, entertainers, and television announcers. The movie *Final Fantasy*, released in 2001, featured an entirely computer-generated cast. Even the most visionary writers and futurists of the twentieth century would have had difficulty accepting the possibility of robots replacing surgeons, engineers, top management, airline pilots, and other professionals. It is not unthinkable that machines may one day write novels or poems, compose music, and eventually replace humans in government and in the management of world affairs.

This is not about the morality and ethics of human participation, but a straightforward description of future technological trends. Nature does not subscribe to human interpretations of good or evil, or hang onto traits or species that are no longer useful. Nature operates with out any concern for previous living plants and organism, many of which have been superseded again and again. There are no permanent structures in nature, although many of us would like to believe otherwise, especially when it comes to our own species.

Although future technical changes are far beyond anything we can imagine today, the most profound effects would not be in the new technologies themselves, but rather in how we conduct our lives and manage our social institutions. As we move toward a cybernated world, most people will no longer be needed to manage and operate this emerging civilization. The world's fragmented social systems will be supported by a network of computerized centers and operations.

Today, computers and AI are not able to advise management about the best ways to maintain a competitive edge. Information about other corporate practices often is not known. In order for industries to maintain their competitive edge, they cannot share their processes, production techniques, or business plans. Even if they did, a railway strike could stop their shipping. Predictability is often outside of their control. It is difficult to plan unless a great many variables are controlled.

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Eventually, interlinked cyber-centers will coordinate service industries, transportation system, public health care, and education with the latest data and the state of the world economy. Interdisciplinary teams of systems engineers, computer programmers, systems analysts, researchers, and the like could supervise, manage, and analyze the effectiveness of the flow of goods and services.

Such a world, linked together by communication networks and continuous flow lines of information and services, will provide a much higher standard of living to all people. Although today automation and Ai applied in a monetary world economy often results in a much higher standard of living, it is only for a relatively small number of people. The advantages of newer technologies are not yet available to everyone.

Today most see computers as simply another clever addition of technology. Yet this technology is now evolving into the greatest force for social change we have yet encountered, allowing us an ever-widening range of decision-making in government, medicine, and industry. Indications are that AI will result in more significant changes than did any previous breakthrough or revolution.

As early as 1971 a single space satellite sent back to earth 400 miles of tape data that would take five competent analysts about 500 years to decipher and convert into useful information. We are approaching a time when human intelligence alone will be incapable of managing a highly advanced society. Existing technologies are rapidly exceeding the human capacity to absorb and process information. The human mind is far too slow simplistic to handle the upcoming information surge. We have neither the training nor the capability to handle the trillions of bits information per second necessary to efficiently manage the new advances.

That is why we urgently advocate a society that utilizes cybernetics not merely as a system of tabulation and measurement, but as a way to process vital information and channel it for the benefit of all humankind. Only our most capable computers can store and sort through the data necessary to arrive at equitable and sustainable analyses and decisions about the development and distribution of resources on a global scale.

In the cybernated global economy, mega machines directed by AI will excavate canals, dig tunnels, and construct bridges, viaducts, and dams. The construction will be based on designs that take account of human and animal migrations and ecology without the necessity of human involvement. Human participation will be in the form of selecting the desired ends. Human labour would no longer be required. In this society construction techniques would be vastly different from those employed today. Self-erecting structures would prove most expedient and efficient in the construction of industrial plants, bridges, buildings, and eventually the entire global infrastructure. This would not create cookie-cutter cities: the notion that large-scale overall planning requires mass uniformity is incorrect. Cities would require less material, save time and energy, and yet be flexible. They would allow for innovative changes while maintaining the highest quality possible but still fitting in with the local ecology, both human and environmental. Utilizing technology in this way would enable a global society to achieve social advancement and worldwide reconstruction in the shortest time possible.

Eventually factories will be designed by robots for robots; the cybernated systems will be self-programming by using environmental feedback. Machines can be self-replicating and improve their operational range, while at the same time repairing themselves and updating their own circuitry. Since the computers and systems would be continuously self-monitoring, parts could be supplied and installed well in advance of any wear. The machines could operate continuously except when conducting their own maintenance and repair. In a resource-based economy all the work of robots would be

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directed toward the well being of humans. In such a social monitoring of people by machines would serve no useful purpose, except where deliberate human feedback was needed.

As artificial intelligence develops, machines will be assigned complex decision-making tasks in industrial, military, and governmental affairs. This would not imply a take-over by machines. Instead it would be a gradual transfer of decision-making process to machine intelligence as the next phase of social evolution.

Automated control could come into being when sensors that monitor the resources of the earth are installed in every conceivable location, linked through a worldwide network of computers. Far from policing human behaviour, these benign monitors only allow us to arrive at the most appropriate decisions for humans and the environment. I must state again that monitoring personal behaviour will be neither necessary nor desirable.

Artificial intelligence is already applied by industry in areas like monitoring weather patterns by satellite, production control, and automation. With further development of computerized systems, environmental sensors and extensors can provide feedback to help us carefully determine successive stages and develop analytical and decision-making tools. The effectiveness of such computerized systems would depend on the number of sensors they were equipped with. We must include unforeseen variables in the environment such as fire, flood, hurricanes, earth-quakes, and other natural man-made disasters.

An example of the tremendous potential of cybernated sensing systems may be seen in a hotel of the future. In the rare event of a fire, an audio-visual alarm instantly appears on the room's TV screen. The screen would display a 3-D image and audio message, describing the route to take to avoid the fire. When exiting the building an illuminated line could show the way out.

Robotic machines will undergo radical changes in their physical appearance and performance as they evolve. They will behave more like living systems and be capable of making appropriate decisions within their sphere of operation. In the event of threats or dangers to humans, they will act on our behalf. To maximize reliability and minimize failure, all computers can be programmed with a degree of flexibility and the ability to shutdown in case of failure of one of their parts.

It is irrational to fear machines in this benign role. Some people think is now much emphasis on technology in this proposal. In fact, it is concern for humanity that inspires me to put forth these ideas about the redesign of a culture and to apply the best of science and technology to enhance the lives of everyone. It is not automated technology or machines we should be wary of, but rather the abuse and misuse of technology by selfish interests. We can build rockets to explore outer space and enhance the quality of life on Earth, or we can use them to destroy other nations. It is people who decide what ends inanimate machines will serve. The aim of this social design is to apply advanced technology to produce abundance and improve the quality of life for all.

To reach decisions, intelligent people acquire information from appropriate sources and behave accordingly. Unfortunately, in pursuing advantage, humans acquire and route information for personal and corporate gain. Cybernated systems programmed for common concerns will prevent unchecked executive authority or abuses of power. In a resource-based cybernated system, decisions are based on direct environmental, human, and industrial feedback from cities, factories, warehouses, distribution facilities, and transportation networks. The decisions are appropriate to the greater needs of society, and not to corporate interests.

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While many people feel uncomfortable about machines making decisions, everyone demands a weighing scale be used when they purchase quantifiable goods. To preclude a power failure in a hospital, people expect back-up emergency generators that automatically switch on with the least amount of inconvenience to staff and patients. We are so used to machines making decisions about climate control, directing traffic lights, answering our phones, forwarding our messages, managing our calendars, and the like that we no longer consider them remarkable. Today people want and expect many aspects of modern life to be handled seamlessly and invisible by so-called "intelligent machine decision."

Few people think about or know how machines make decisions. When additional machine use is proposed, they project their own personal agendas and emotions into the machine design. While some fear machines, there has never been a single deliberate act or plan by machines to hurt anyone. Unfortunately, the same cannot be said of human beings. Humans, not machines, use nerve gas and missiles to destroy. Even automobile accidents are mostly caused by human beings, rather than by mechanical failures, and most mechanical failures can be traced back to human error.

It is easy to understand how we might accept computer decisions when we consider possibilities such as this a man, leaving the top down in a convertible, feels a few raindrops and must pull over to raise the top. It would be more convenient to have a system of sensors in the car that would raise the top automatically when rain begins. One sensor detects the raindrops and another scans the car to ensure no fingers or pets will be injured by the mechanism automatically putting up the top and side windows. This, and much more, is technically feasible. The question is: how smart do you wish your car to be?

Another example, designed and patented by the author is a lightweight net installed at the bottom of a swimming pool. If a child falls into the pool, the net is activated to come up from the bottom of the pool saving the child when the parents or guardian are inattentive. When no one is using the pool the net stays at the surface. The net requires no human decision. The net's computer reacts to feedback from the environment. Humans will still be relevant in this new society because they are the ones these machines are designed for.

Only in a cybernated world can decisions be based on the full range of data available, without interference from human ego or self-interest. This could eventually provide us with the best solutions to most social problems.

The majority of problems in computerized systems come from flawed human intervention. Computers will eventually be capable of designing their own programs, improving and repairing their own circuitry, and updating information relevant to social needs. Almost all life forms of the past including plants, animals, and even humanoid forms, have been replaced during the process of evolution. There are no permanent structures in nature. The assumption that the human being is the final product of evolution is based upon narrow self-centered projection. The human being is not a separate self-sufficient entity: we are integrated into and dependent on nature to survive.

It is arrogant and unrealistic for us to believe that man is the final product of evolution. More and more we see the merging of human ingenuity with machine intelligence. How many have been helped by artificial limbs, joints, hearts, skin, and so forth? How much pure information, unhampered by human frailties, is processed by computers every day? The next stage of evolution must surely be the merging of biological systems with man-made systems. It takes millions of years for organisms to

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evolve, and additional thousands of years for them to shed vestigial organs. The human increased in size and complexity due to the many new convolutions in its neuronal development. The enlargement of the brain was accompanied by a corresponding increase in the capacity for associative memory.

The development of electronic systems required a different "evolution." Early computers were huge room-sized fixtures, but now information storage ability keeps increasing while the hardware occupies less and less space. Another major difference in technology is that non-functioning parts are eliminated or replaced immediately. In human systems old ideas may be retained far beyond their usefulness and new ideas shunned. In artificial intelligence and computerized systems information is updated rapidly, appropriately, and constantly. Today it takes years to transfer acquired knowledge to another person, whereas in computerized systems information can be transferred instantaneously to an entire global network.

Most of us cling tenaciously to old habits of thought, but technological progress has little use for custom and tradition. Human systems are subject to neural lag, and tend to revert to the familiar. Neural lag may be defined as the tendency to resist new and appropriate associative patterns in favour of old, familiar ones. For example, during the early stages of automotive development a statue of a horse's head was mounted on the hood, and the rear of the car retained a coachman's seat.

If neural lag had prevailed in electronics, the industry would have failed to achieve in many technological innovations. To remain at the forefront of technology one must update one's methods, discard outdated technology, and examine new paradigms. Our present social design doesn't keep up with the rate of change required to take advantage of the accelerated pace of information and innovation. The person of today thinks in terms of having to get a job in order to support himself and his family. With the limitless possibilities of our technology today, this could be considered an example of neural lag. The adherence to a mentality of scarcity is another.

No matter how strong our fear or resentment of social cybernation, the process is already underway. In all branches of industry, medicine, agriculture, and technology, computers are being assigned the role of decision-making. As we outgrow the need for human participation whether in the military, the marketplace, or eventually government, more and more tasks will be assigned to artificial intelligence.

Although politicians, decision-makers, educators, humanists, and the literally community will probably resist cybernation, the greatest resistance will come from the general public, attuned as they've been to being directed by other humans for thousands of years. But cybernation will prevail. As an old Chinese proverb says: The dogs may howl at the moon, but the moon will continue on its honourable journey.

## MACHINE EMOTIONS IN A CYBERNATED SOCIETY

Let us look at the matter of emotion in machines. Imagine an automobile with computerized emotions linked to built-in feedback mechanisms. This car has a pendulum under the hood and when an abrupt turn is made, it is prompted to respond via its speaker system, "What are you trying to do, destroy the car and everyone in it? Where did you learn to drive? Have you no regard for other?"

Worse yet, what if the car suddenly decided it didn't like you in the middle of that abrupt turn?



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Of course, this is preposterous. But how often does such an approach fail when we use it to modify the behaviour of others?

What purpose would emotions serve if incorporated into the design of intelligent machines? Machines have no emotion. They do not feel ambition, love, or hate. They do not seek power over people nor do they harbour any repressed desires to harm or enslave anyone. They won't make demands on their users or seek revenge if misused. They will not hold a grudge, complain, or manifest guile and deceit. These are human traits.

With no understanding of or sensitivity to human emotions such as love and trust, machines guide aircraft, ships, and spacecraft to their destinations and make decisions about how to avoid troublesome weather. With no concept of charity machines provide an abundance of food and preserve it by refrigeration. They heat and cool our homes. They sound alarms in the event of fire and warn us when hurricanes and tornado threaten. They order parts for machines before they wear out. Although they do not hold the hand of distressed person, they warn us about toxic gasses in the environment.

Perhaps human emotions would be the only attribute, if given a choice, which machines technology would reject outright. When one thinks about it, the fact that machines have no emotions may in some ways make them superior to human systems. This appears to be the case when the task requires immediate response and dispassionate weighing of options.

We could put pressure sensors in tires so that they maintain required pressure with a built-in pump. We could program them to slow down automatically to 15 mph when their monitors detect a school zone. If there were a child or pet behind the car when backing up the car would automatically stop.

It makes more sense to design built-in standards of performance that operate the car, rather than try to alter the behaviour of the driver with verbal abuse or stern admonitions. This same system could be applied to all aspects of the electrical, mechanical, and computerized cybernated world of the future, including human communication.

It is not a matter of the machine "caring" about the results of its actions. It is a matter of designing the function of safety into the machine. It is not emotions that machines need, but built-in responsibility to the humans they serve. What we require of them is to act intelligently with respect to human welfare and make appropriate responses to a wide range of situations. If all of this could be accomplished without emotions, does this not raise some interesting questions about a number of human emotions?

## NANOTECHNOLOGY TO COME

Nanotechnology will eventually control and direct the building of molecular structures, atom by atom, into any molecular configuration we desire. By such a process we will be able to rearrange matter and eliminate shortage forever.

With sophisticated technologies like atomic and molecular replication, we might be able to reengineer natural process with advanced robotic manipulators that utilize phase array teletactile communication. "Phase array" is the control and manipulation of light to generate three-dimensional images that appear solid. "Teletactile" is the ability to impart the sensation of solidity and touch to a merely transmitted object. This advanced form of telecommunication will create a virtual simulation one can see, feel, hear, smell, and touch.

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Although such instantaneous technologies may be difficult to comprehend today, it is just an extension of current technologies, and similar to the way colour television images are transmitted to any part of the world today. The difference is that the image and sound will be transmitted three-dimensionally and feel solid to the touch.

The next step involves directly replicating an object rather than merely simulating it. On Earth this might be accomplished instantaneously and could eventually eliminate having to transport objects from place to place. Beyond earth it could be the future transport system from one planet or galaxy to another. Space transportation, though requiring speeds inconceivable by present standards, would likely not be instantaneous, because it takes time even to transmit information.

As nanotechnology advances, machine could have a transmorphic capability, being able to change shape to the most efficient form to accomplish any given task. Such machines could constantly assess conditions as they perform tasks and "morph" into a more appropriate configuration as necessary.

To understand this process, imagine evolution as a series of rapid successions, unlike the millions of years it takes to accomplish organic changes. Machines as described above could instantaneously rearrange their molecular structures to best serve human needs.

Of course such machines will not look like conventional machines, any more than a microchip looks like a phonograph record. They would be as different from our present machines as humans differ from primordial life forms. Today, living systems conform to the world by natural process or they perish. In the future machine systems will adjust the world according to specification set by an emerging culture, a culture that will, hopefully, be dedicated to universal human and environmental well-being.

## THE DOWNSIZING OF THE GODS

AI will eventually supplant antiquated notions about gods and demons. As our own powers increase, there will surely be a corresponding decrease in humankind's tendency to seek answers and solace in religion or superstition. Nature or the gods take thousands or millions of years to accomplish the slow process of evolutionary change. Modern technology can instantly reproduce all the information of recorded history. With advances in nanotechnology, we may some day be able to instantaneously arrange matter onto any desired configuration.

Reengineering of genetic code may enable us to reduce or eliminate genetic diseases and defects and even reproduce organs, bones, or tissues that is less likely to fail or be subject to disease.

Our relationship to the space-time continuum could also be modified. For example, we may be able to travel through almost anywhere in the universe. In other words, unknowingly we are toward the reinvention of our gods. We may even, in the future, find that we have outgrown them.

To those who feel threatened by such concepts, it is not intelligence we must fear, but ignorance.

## IN CONCLUSION

We are at a time when mathematical logic and computers can assist us in unravelling the process of human thought. Our growing understanding will enable us to enhance

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future computer technology. Existing economic and political structures and processes no longer provide the support needed to keep up with and implement changes in technology. The focus on profit secrecy, and competition runs counter to the possibilities for positive change afforded by the current democratic broadening of technology. The Internet makes possible a spirit of collaboration and open exchange of information. It is time to put new social economic structures in place.

In time, the computer and social cybernation may be seen as the only means of social management that are entirely free of selfish motivation. This may be the most humane approach to our human dilemmas.

We require a global perspective, international cooperation, and planetary planning in terms of available resources. This planning must relate to the carrying capacity of Earth to meet the needs of all people. This can best be accomplished by using a constantly updated computerized model of our planetary resources in a resource-based economy.

Advanced social systems do not require scientists or governments to tell them how to operate. The ultimate decision-making authority represents the expression of all humankind. This vision of applied science can serve the common good, a goal that has eluded human civilization for centuries. Although this revolution is still largely in the future, the possibility of a better life for all the inhabitants of our planet will depend, ultimately, on choices we make today.



### ROBOTS CONSTRUCTING ROBOTS-MULTI ACCESS INDUSTRIAL ROBOTS

These “multi access industrial robots” utilize vast information resources, which enable them to receive commands via satellite up-link or on-site. They can also be designed to take appropriate actions in the absence of human directives by combining an array of Micro Electro Mechanical System (MEMS) and sensors and receivers with sophisticated decision-making circuits and artificial intelligence programs. They will be capable of handling a wide range of industrial production tasks, and will even be able to upgrade their level of service and replace their own parts. When necessary, these mega robots will communicate with one another and coordinate the logistics and delivery of the required materials for each project.

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## NANOTECHNOLOGY

The future of nanotechnology offers enormous potential. Nanotechnology combines optics and lasers, and will eventually enable us to assemble matter, atom by atom, into whatever molecular structure is needed. Nanotechnology will lead to a sub-microscopic revolution in all fields, including the way in which we conduct human affairs.

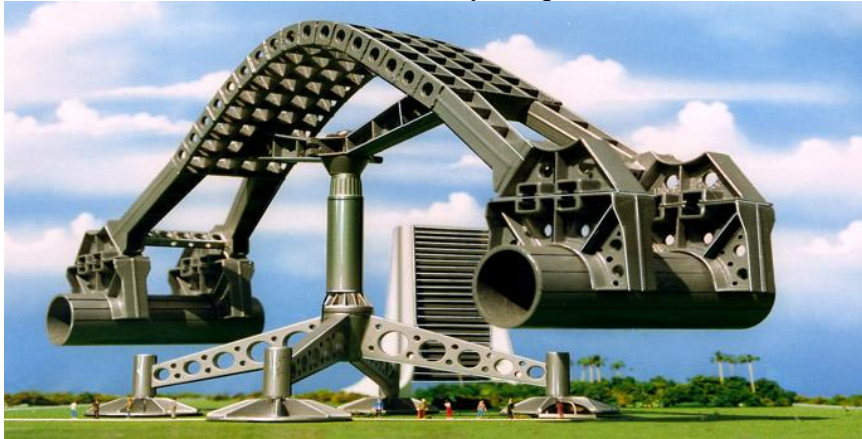


## MEGA-EXCAVATION MACHINES

This scene depicts a laser excavator of the future. Such devices, directed via satellite, would be capable of fusing the earth beneath it into a molten, magma like material, thus contouring the earth to aid in the construction of canals, roads, and waterways.

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## AUTOMATED TUNNEL ASSEMBLING MACHINE

Tunnel segments float down canals by the use of very large flotation devices. This automated tunnel-assembling machine lifts the prefabricated segments and places them in their required positions. Once completed, the tunnels are used for high-speed, mag-lev transportation.



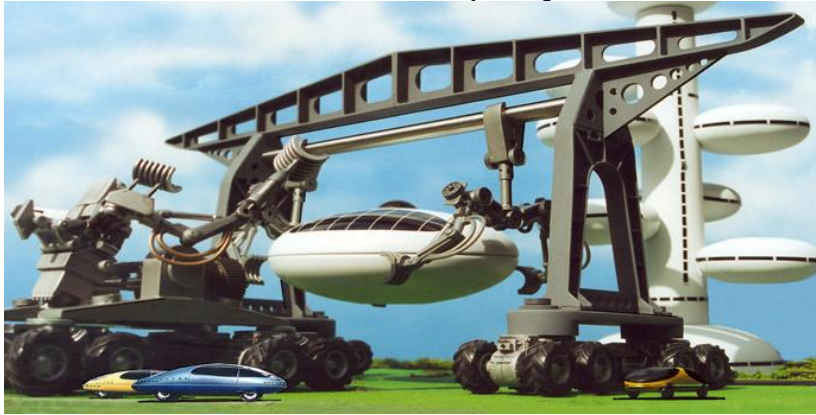
## THE CONSTRUCTION OF TOWERS

These towers are designed specifically for regions where earthquakes are prevalent. Such cable-suspended structures easily withstand a wide range of movement, stresses, and strains. Circular towers radially arranged in a city's design may be self-erected efficiently and rapidly around a central core that houses elevators and all other household utilities. The translucent windows serve as photovoltaic generators, and the intensity of the light entering the windows can be varied electronically. All window cleaning and maintenance is automated.



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## MASSIVE LIFTING CRANE

This multi-function crane is designed to lift freeform structures and position them on foundations and stilts or transfer them to vertical lift systems that place the units on towers. Upon completion of their task, these self-erecting cranes can be disassembled into a compact form for easy transportation to the next assignment.



## MASS-PRODUCED EXTRUDED DWELLINGS

This demonstrates how lightweight, carbon fiber-reinforced, concrete apartment dwellings could be produced as continuous extrusions and then separated. The outer shells of these efficient structures will serve as photovoltaic generators.

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## LIFT AND POSITIONING CRANE

This automated machine places these prefabricated dwellings on sites where they can be positioned in place by the machine shown on the adjacent page. It is designed to handle structures of many different configurations.



## MEGA MACHINES

The machine in the foreground is a multi-function unit. As shown, it lifts and inserts prefabricated housing components into a support structure. Although these “prefab” units will be composed of standard components, they will be of a modular design of such diverse array as to allow maximum individual expression in interior design and décor.

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**AUTOMATED CONSTRUCTION SYSTEMS**

The construction of these industrial and research complexes can be carried out by robotic equipment that receives instructions via satellite. These construction crews of the future consist of automated cranes that travel along the buildings' length, installing floors, windows, curtain-walls, roofing, and other components from the ground up, entirely free from human intervention. These devices will contain self-monitoring sensors to minimize industrial accidents or collisions with other devices or living beings.

## **9.WHEN GOVERNMENT BECOMES OBSOLETE**

GOVERNMENT ENACT MANY DIFFERENT LAWS in an attempt to control society. However, we find no evidence of a deliberate plan by any government to design a sustainable and workable social system to improve the lives of everyone rather than the few holding high positions in the established order.

Visionaries have sought to improve the lives of people by instigating changes within the established social order. Semanticists called for improvements and clarifications of meaning in our language. The Communists advocated state-ownership and the end of capitalism and human exploitation. The Fascists created a dictatorship of the rich and powerful. Socialists called for a re-ordering of our priorities to serve humanity by a more equitable distribution of existing resources. Religious groups crusade for a return to simpler times, to family, values, and the teachings of their charismatic leaders. We call for the establishment of scientific scales of performance applied to the social system for the benefit of all.

With the application of the methods of science to the social system, people would have a better understanding of nature and the symbiotic process of which we are an integral part. This could help provide an understanding of the relationships between ourselves and nature, and prevent the over-exploitation of land and sea.

Many people assume that government leaders bring about change with a concern for the well-being of the citizenry, but nothing could be further from the truth. Nor did past changes in society come about as the results of efforts in the schools or home. Established government systems seek to preserve and uphold their own interests and power-base.



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The real forces responsible for change have to do with external events or biosocial pressures that physically alter the environment and established social arrangements. For example, machines and processes that replace people and remove their means of making a living, natural conditions of drought, flood storm, and earthquakes, manmade disasters of economic, oscillations, or some outside threat from hostile nations.

The industrial revolutions did more than move the centers of population from small farms to large cities. It changed how we relate to our communities. World War II changed the roles of women in this country. Droughts and wars in Africa today are moving whole populations from their ancestral tribal lands into cities, destroying entire cultures almost overnight.

Laws are, at best, attempts to placate or control a population, and they work only sporadically. Another method designed to control human behaviour is early indoctrination towards a given set of values, such as patriotism, propaganda in the national interest, or nationalism. In this way the citizenry is "programmed" to support an existing government, and unaware that other options are available.

Another safeguard used by and for politicians is the pushing of the concepts of personal responsibility; that we are all responsible for our own shortcomings, failures, and misfortunes. In fact, in accordance with natural laws that govern all activities, most of our actions are determined by the circumstances that surround us. Many so-called free choices are greatly influenced by the culture and values of our times.

Manmade laws seek to preserve the established order and protect people from deceptive business practices, false advertising, theft, and crimes of violence. This calls for constant monitoring of the populace because the laws are continuously violated. Such problems are often caused hunger poverty, war, oppression, and scarcity, but the answer lies in removing the conditions that are responsible for these problems. There is so much economic deprivation and insecurity, even in the most affluent nations, that no matter what laws are enacted, the problems persist. The legislators passing laws have permitted gross violation and often break the law themselves.

The need to protect human rights results from having a scarcity-oriented society. This can be seen if you think about such elements as air and water. Although both are necessary for well-being and survival, there are no laws regulating how many breaths are taken per hour, because we have an abundance at this time. No one monitors a gushing spring to see how much water someone takes from it although fresh water is necessary for life. If it is abundant no one monitors it. In the western U.S. there is a tangle of laws that conflict and overlap on matters of agricultural and fishing rights to fresh water.

When a nation creates laws to regulate human behaviour, the majority of legislators are unaware of the factors responsible for the need in the first place. All nature is subservient to natural law. Natural laws dominate all living systems. Without nature's water, sun, or nutrients, plants and animals would die. In an environment of scarcity, hunger, and poverty, human behaviour must adapt accordingly.

When laws do not correspond to the nature of the physical environment, they will be violated. Consider moral codes that attempt to suppress biological sex drives. Eventually, with a deeper understanding of natural law and the effects of social and cultural influences on human behaviour, we may begin addressing the real problems rather than punishing those who transgress.

In a resource-based economy social responsibility would not be a function of force, intimidation, or promises of heaven or threats of hell. Protection of the natural environment would not depend on fines or penalties for polluters. Safeguards against

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abuse could be designed into the environment. An example of this is the proposed design of cities of the future where people have free access to resources without debt. This would eliminate theft. Such measures are clearly not a matter of passing and enforcing laws to prevent and punish abuse. Rather, they design the flaws out of social ventures in the first place, thus eliminating the need for many laws.

Paper proclamations carry little weight in the real world. Such attempts at social order are "BS", Bad Science. Not long ago, black Americans did not have access to public water fountains, despite constitutional guarantee. Many similar examples can be cited as violation of so-called rights.

A society with human concern "designs out" the need for laws and proclamations by making things available to all, regardless of race, colour, or creed. When governments make laws we are led to believe they are made to enhance people's lives. In truth, laws are the by-product of insufficiency.

When population size exceeds available resources, values and behaviours change. With scarce resources management and allocation are stringent. A set of laws evolves which corresponds to these changed conditions. Tracking a culture's evolution reveals the events and environmental influences that determined its values, habits, outlooks, beliefs, and social conduct. For example, if an outbreak of disease reduced the male population by 80%, laws governing sexual behaviour and marriage would undergo vast changes.

We long to be free of flawed corrupt human thinking and emotions which have made a graveyard of half of the world. In spite of all the laws, paper proclamations, and religious teachings intended to preserve and promote the democratic process in our monetary-based world economy, depravity exists. Even the United Nations, our most enlightened organization, is motivated mostly by self and national interests, rather than by the overall good of humankind.

As we transition to a cybernated governing of human affairs, newer technologies will remove human error from the political bureaucracy. These machines can provide governing bodies with information rather than opinion, thereby reducing bias and irrational, or purely emotional elements in the management of human affairs. In this emergent developing social arrangement which is not yet established, the rules of human conduct will undergo drastic alterations.

A world-wide resource economy could bring about vast changes in human and interpersonal relations without the enactment of laws. It could encourage values relevant to the needs of all people. A world-based resource economy regards the world's resources and technical information as the common heritage of all nations, to be used for the benefit of all. This is the unifying imperative. Once in place, the world could see an end to armaments, war, drugs, greed, and other problems brought about by the endless pursuit of money and power.

Humans require an education system that teaches process and analytical skills rather than randomly chosen facts. Dialogue would replace debate. Semantics would become a core skill that would greatly improve human communication. Students would intelligently evaluate a situation and access relevant information rather than simply solve rote problems. It is not that they would suddenly become better or more ethical, but the conditions responsible for hostile and egocentric behaviour would no longer be present.

Today we control human behaviour with laws without changing the physical and social conditions responsible for aberrant behaviour. When Earth's resources become

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the common heritage of all, the necessity for irrelevant laws and social contracts will vanish.

Concerning “who” will govern, the more appropriate question is “how will be people be governed?” People do not have to be governed and do not require leaders unless they are ignorant, captive, wage slaves, or subject to a dictator. If the free enterprise system does not include job security, medical care, and the other necessities that secure the population as a whole, a wide range of conflict and unmanageable human behaviours results, no matter what laws are passed.

No “one” will decide who gets what. Perhaps the closet analogy within our present culture would be the public library, where anyone has access to nay book of his or her choice. Goods and services could be made available in a similar manner across the entire economy. Unfortunately, we are in the habit of thinking that someone has to make decisions regarding our needs. This would not be the case in a cybernated resource-based society without scarcity.

In the near future, because of advances in technology like artificial intelligence, cybernation and nanotechnology, we can achieve a global community and share a common vision for humanity. Computerized technology will unite people and eliminate scarcity better than have all the world’s religions and democratic ideals combined. We can transcend the limitations of a monetary system, and outgrow our need for politicians and artificial manmade laws intended to preserve and perpetuate the status quo. AI could regulate production, transportation, and all burdensome and monotonous tasks, but not people. A highly integrated complex of computers that serves, but never enslaves, humankind could carry out the major tasks of decision-making and environmental management.

I must again emphasize that this approach to global governance has nothing in common with the aims of an elite few to form a world government with themselves at the helm, and with the vast majority subservient to them. This newer vision of globalization empowers each and every person on the planet to be all that they can be, without living in abject subjugation to a corporate governing body.

The question is, can we grow beyond that “someone” has to make our decisions for us?

## 10. WHO WILL MAKE THE DECISIONS

THROUGHOUT HISTORY, the societal decision-making process has gone through a number of changes. At one time primitive tribes and their ruling chieftains and kings decided upon a set of laws, beliefs, and mores designed to support and defend the ruling oligarchies. As primitive cultures joined together, possibly for mutual protections, the chieftains of the various tribes shared some decision-making.

With the advent of nations, councils were appointed to participate in decision-making, to prevent any one of the leaders from dominating. The less privileged were not included in this process. As the ruling classes imposed greater hardships on their subjects through taxation and other abuses of power, uprising, intrigue, sabotage, and assassinations by the oppressed people forced changes in the laws of the land. Governing bodies were then appointed to carry out and uphold laws.

Although wealth has always “bought” political office, it was at the beginning of the nineteenth century that financial interests began in earnest to play the leading role in inappropriate decision-making. Politicians use every means of deception to consolidate

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their positions, repeating slogans used for centuries such as, "a return to family values," "to serve God and country," and other verbal expressions of undefined goals. They talk around every issue without saying anything of substance, placing emphasis on the role of law and order in government and on international agreements. They enact new laws to control behaviour and if these don't work, they resort to force, boycotts, and blockades. But none of the methods ever addresses the root cause. Most people believe that to set things right, all we need is to replace incompetent and corrupt officials in government with decent men and women of high moral character. Although we occasionally find politicians of sincere intent, they seldom find useable answers to problems. Human systems fail, obviously, to serve the needs of humanity. This is true across the entire spectrum of human administration: the church, the government, the military, and the banks. In the past most social designs were unsuccessful for the majority because their designers were unable to transcend the limits of their own environmental conditioning. We tend to bring our past into the present and project it into the future.

Today, the laws that govern society are not based on truly comprehensive and scientific studies. They are based on opinions and traditional practices. For example, our approach to dealing with an increase in crime is to build more prisons, rather than alter the conditions responsible for socially offensive behaviour in the first place. In a recent discussion with criminologists it was pointed out that if our crime rate continues at its current level, more than half the U.S. population will be in prison by the year 2010. The other half may well have to guard them. Rather than depend on a failed system of punishment of incarceration after the damage has been done, a more effective approach to solving our problems would be to shift our attention to the scourges of poverty, malnutrition, poor role models, violence in the media, and stresses in family life. We need to make an effort to teach people how to resolve conflict without the use of physical force.

The discovery of scientific principles enables us to validate and test many proposals. If someone claims that a particular structural element can support a specific number of pounds per square inch, the claim can be tested and either substantiated or negated based upon the test results. It is precisely this process of testing which enables us to design and construct bridges, buildings, ships, aircraft, and all other mechanical wonders.

In the new social design outlined in this book, scientific and analytical principles can be applied not only to industry and construction, but also to the personal and human components of society. This may lead to the allocation and application of more scientific resources to the study of human behaviour. The most difficult aspect of redesigning a culture is that the approach seems undemocratic. By what authority does any group effect a new arrangement of social affairs on those living in the current arrangement?

This brings up three questions of primary importance to the redesign of a culture:

- 1) For whom is the culture designed?
- 2) What ends are to be served?
- 3) Who will benefit everyone or a few?

Throughout history, social affairs have either been pre-arranged, or have eventually worked out to benefit a power elite and money interests. Even in so-called democracies this has been the case. People fear a planned social system may not serve their interest. They perceive a danger that the introduction of any new social arrangement carries with it the possibility of the development of a new elite.

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If a particular religious group were to design a society, it would quite naturally reflect the group's beliefs which would be seen as the "will of the people." The majority of this group would democratically agree that theirs is a good social design. The atheist, agnostic, Hindu, Muslim, and others not represented would naturally object. What is needed is a way to determine the most appropriate direction that will be agreeable to all. As difficult as this may appear, it can be done.

Today we have a decentralized system of decision-making, and decision-makers are seldom aware of problems in regions outside their immediate vicinity. Those in sub-tropical Florida have difficulty understanding water rights in Arizona. A Berger of Morocco would be challenged if asked to design a health plan that matched the life styles of people in Norway. Each of us must participate. And we need verifiable and current information on which to draw up plans.

When computer have their electrical sensors extended into all areas of the social complex, we will be able to return to successful centralized decision-making. In a global resource-based economy decisions would not be based on local politics but in a holistic problem solving approach. Earth and the life on it must be seen as constituting a single system.

This centralized whole system could be connected to research labs and universities so that all data is monitored and updated constantly. Most of the technology to allow such infrastructure management is currently available.

For example, when electrical sensors are extended into the agricultural region, computerized systems could manage and control the agricultural requirements by monitoring the water table, insects, pests, plant diseases, soil nutrients, and so forth. Computers and artificial intelligence will be a catalyst for change. They will establish scientific scale of performance. It is doubtful that, in the latter part of the twenty-first century, people will play any significant role in decision-making. Eventually the installation of AI and machine decision-making will manage all resources and serve the common good.

Computers as decision-makers will also scan for new information and methods of conserving resources to accommodate the carrying capacity of each geographical region. This will result in a more humane and meaningful approach for shaping tomorrows' civilization, one not based on the opinions or desires of a particular sect or individual. In the event of a regional or national emergency, special information and already-developed plans for known types of catastrophes would be available, just as military contingency plans are today.

Decisions would be made on the basis of a comprehensive resource survey and the availability of energy or existing technology as opposed to the advantage to be gained by any nation or select group of people. This resource survey would determine the carrying capacity of each geographical region of the global environment.

## 11. CLEAN SOURCES OF ENERGY

SOME WILL CLAIM LIMITED RESOURCES prevent us from achieving a society of abundance. This is simply not so. We still have more than enough resources to achieve a high standard of living for everyone. But it's time to move beyond failed programs and frustrations to innovative solutions that could be applied now if we direct our attention to overcoming scarcity. We have the capability to intelligently apply humane science and new technology to provide for most human needs, and to reclaim and restore the natural

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environment. Fossil fuels such as oil and coal allowed our civilization to progress to its present state of development. However, these energy sources are limited and non-renewable, and one of many environmental dangers.

In designing a new civilization we must harness energy, a major source of material well-being for all nations. This is a double-edged sword. When placed in the hands of private interests and greed, energy can be used for destruction. The current stock of atomic weapons can destroy the world many times over. But fusion power and other forms of clean energy, when used intelligently, with human and environmental concern, could provide all of the nations of the world with clean, unlimited energy sources and a standard of living unattainable today.

Much remains to be accomplished in the undeveloped areas of our planet. Vast and untapped energy sources remain largely unexplored and untouched. These include wind, wave, and tidal action, ocean currents, deep ocean pressure and temperature differentials, falling water, geothermal and electrostatic power, hydrogen and natural gas, algae, bacteria, phase transformation, and thermionics, or the conversion of heat into electricity by boiling electrons off a hot metal surface and condensing them on a cooler surface. Additionally, there is the untapped potential of Fresnel lenses, inflatable dome versions of which are being developed for use as optical concentrators in solar power systems.

Fusion power welds together light atoms such as hydrogen and lithium. Fusion energy is the energy that drives the cosmos and the stars. When we learn how to harness it, the world's energy problems can be solved forever, without any detrimental effects or dangerous toxic materials to be disposed of. The only residue would be the clean ash of helium.

Oceanographers tell us that the world's oceans, occupying 70.8% of the earth's surface, possess an endless supply of surging energy called deuterium, a heavy hydrogen atom locked in the seawaters. According to John D. Isaacs and Walter R. Schmitt, the amount of fissionable uranium and thorium in the oceans can support our present level of power production for millions of years. It is highly probable that in the next century our main source of energy will be thermonuclear fusion or geothermal extraction. Both appear relatively free of the hazards inherent in energy produced by nuclear fission.

The transfer of electrical energy will probably be facilitated by improved methods of superconductivity, utilizing cryogenics as part of the international power grid. This grid could serve primarily as a supplement or backup to self-generating structures within the cities. A key element of the design of cities in the future will be embedding of all necessary energy creation within the structure of the city itself.

We could also utilize solar concentrators as an alternative to fossil fuels for the generation of heat. As of this writing, the Argonne National Laboratory and ARDI are developing a production technique for solar cells that will be nearly 70% efficient at a cost one-tenth that of silicone-based cells. There are many other possibilities for developing photovoltaic systems that generate electricity while harnessing the currently untapped radiant heat energy.

The world's single most powerful hydro-electric project is now being constructed in the Tsangbo Bend in Eastern Tibet, where the river Tsangbo is fed by great glaciers and waterfalls which descend over seven thousand feet. When the Chinese harness the energy of this dam, it is estimated that the turbines in this power project will produce more than forty million horse-powers. This is equal to the total world production of hydroelectric power today. Another vast untapped energy option is the development of piezoelectric materials. This source could be employed by using laminated systems

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inside cylinders, activated by the rise and fall of tides. A recent development of one of these materials is polyvinylidene-fluoride. Five square kilometres can supply electricity for two-hundred-and-fifty thousand people at a cost of one to three cents per kilowatt power, a considerable savings over fossil fuels.

If we developed and harnessed only 1% of the geothermal energy available in the crust of the earth, all our energy problems would be eliminated. Geothermal energy can supply us with more than 500 times the energy contained in all the fossil, oil, and gas resources in the world. Geothermal power plants produce very little sulphur, compared to fossil fuels, and emit no nitrogen oxide or carbon dioxide. A relatively small area of land is required for the power plant itself. Geothermal power is the most economical and efficient way to heat and cool buildings. Natural heat stored underground in combination with the permafrost zones could generate thermal electric power and utilize this power to cool buildings in warm weather with geothermal heat pumps. Geothermal energy can also be used to grow plants year round in enclosed areas, as has already been accomplished in Iceland and elsewhere. In this way fresh vegetables could be cultivated in all seasons. A similar process could be used for fish farming and in other regions where heating and cooling is needed. If we had applied just one tenth of what we've spent on military equipment to the development of geothermal generators, we could have long ago solved any energy shortages.

In a resource-based economy, a comprehensive analysis of the environmental, human, and social impact would be carefully analyzed before construction began on any project. In all endeavours, a major concern would be to protect and restore the environment for the benefit of living beings from unnecessary expenditure of energy and from laborious tasks. Up to the present, social development in our money-oriented society evolved in a haphazard manner, and was affected by many interacting variables. This process seriously delayed achieving the advantages inherent in a global cooperative project to develop renewable energy resources rather than exhaust limited resources.

We have the means to determine globally the best energy resources available for each geographical location on our planet? What is desperately needed in this world of high technology and rapid change is an energy development strategy on a global scale. Developing a global sustainable strategy would call for a joint venture of international planning on a level never before achieved.

Eventually, international life arteries could serve all nations economically and efficiently. Only by utilizing the best planetary planning can wasteful consumption be reduced. Only by reducing wasteful consumption can we achieve our end goal, the highest possible standard of living for all of the world's peoples.



HARNESSING THE GULF STREAM



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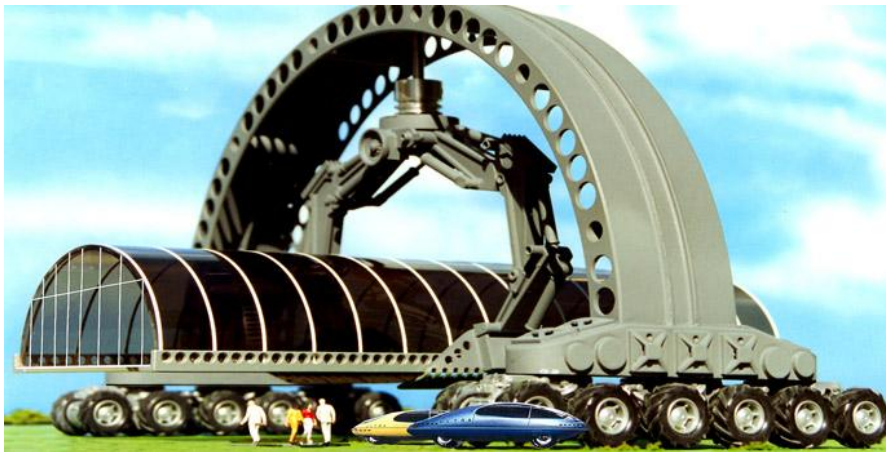
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These underwater structures convert a portion of the flow of the Gulf Stream through turbines to generate clean electric power. The turbines would have a centrifuged separator and deflectors to prevent harm to marine life.



### BERING STRAIT DAM

A major development In the future could be the construction of a land bridge or tunnel across the Bering Strait. The primary function of this span would be to generate electrical power and house facilities for collecting and processing marine products. Beneath and above the ocean surface would be tunnels to transport passengers and materials. Pipelines to conduct fresh water from melting icebergs to other parts of the world may also be incorporated. Not only could this structure provide a physical link between Asia and North America, it could also serve as an avenue for social and cultural exchange.



### DESALINIZATION PLANT

This mega-machine if transporting a transparent enclosure used for evaporative condensation. It would be placed over canals, some of them containing salt water, and could serve as a desalinization plant to supply clean water for drinking, irrigation, and other needs. This is accomplished by harnessing the power of the sun and will eliminate water shortages throughout the world.



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GEOTHERMAL ENERGY PLANTS

In the future, as refinements in conversion technologies increase its feasibility, geothermal energy will take a more prominent role in reducing the threat of global warming. Readily available in many regions throughout the world, this source alone could provide enough clean energy for the thousand years.

## 12. CHANGING HUMAN NATURE

MUCH OF THE BEHAVIOR ACCEPTABLE TODAY would be socially offensive in a saner or more logical arrangement. But whatever better values, ideals, and behaviour people aspire to cannot be fully realized when there is hunger, unemployment, deprivation, war and poverty. People deprived of income will often do whatever is necessary to provide necessities of life for themselves and their families. Their values may be exemplary but their behaviour will reflect the reality of the situation. After World War II, for example, even the most respectable German families could be seen fighting over scraps of food in garbage cans to survive. In a scarcity-oriented society generosity is a rare occurrence. It is not enough to design new cities and make sweeping generalizations about human participation and democratic ideals. We must re-examine our dominant values and how and why they evolved.

During the transition to this saner world, there will be interpersonal conflict, egocentric behaviour and all the other problems that plague our present day monetary society. Therefore it is essential that we utilize newer methods of evaluation to greatly enhance human behaviour.

When we examine human behaviour in the same manner as any other physical phenomena, we will better understand the physical factors responsible for shaping our values and behaviour. In the natural sciences all physical phenomena are acted upon by resident forces. For example, a sailboat does not sail of its own accord; rather, it is activated by the wind. A telephone pole does not just fall to the ground; it is acted upon by rain, gravity, wind and a number of other variables.

Human behaviour in all areas is just as subject to natural laws and the actions of external forces: it is generated by the many interacting variables in one's environment. This applies even to behaviour that is socially offensive. It is often influenced either by one's experiential background, nutritional factors in early life, or a number of other interrelated environmental factors. When one sees a dog leading a blind person across the street we tend to think it is a good dog. But when we see a dog bark at a cyclist we call it a bad dog. The dog is neither good nor bad. A dog can be trained to be ferocious or

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to help the blind. Both animals could be of the same breed, even from the same litter. Their behaviour is due to the differences in training.

To put it another way, imagine an ancient Roman family watching Christians being fed to lions. Someone today might be horrified and believe the people watching had trouble sleeping that night. But they most likely had no trouble sleeping at all. Such bloodshed was the cultural sport of the times. Lion and Christian were looked upon with equal disdain.

Or imagine a modern day fighter pilot, trained in warfare and taught a similar disregard for the other's culture and beliefs, losing sleep over shooting down twenty planes and burning several inhabited villages. More likely he will beam as he is presented a medal, and adorn his aircraft with symbols of his "kills". The pilot reflects the values of his culture just as the Roman family did. What we call our 'conscience' and 'morality' are not determined by an invisible "higher" self." They are largely determined by geography, the times, and an individual's upbringing.

One of the greatest limiting factors in human systems is our inability to grasp the significance of resident forces and the extent to which that environment shapes our thinking, values, and/or behaviour. When we speak of environment, we mean all of the interacting variables which are the prime contributors to our mindset.

A fundamental consideration in the physical sciences is that one must identify all of the physical factors responsible for certain outcomes. When an automobile acts in an unusual way, most mechanics can account for the reason and identify the physical factors causing the condition. When human being appears at a hospital with an injury, even if he or she is unconscious and unable to identify the cause of the injury, a competent medical staff can usually identify the cause.

With certain forms of aberrant behaviour neurologists, biochemists, and psychiatrists can, to a limited extent, identify some of the conditions responsible for the behaviour. Even in everyday life, evidence supports the connectivity of influential events all around us. But we often fail to apply the same methods of evaluation used in the physical sciences to human behaviour.

In many instances our collective values are influenced by an existing social structure or subculture within society. For ill or well, social systems generally tend to perpetuate themselves and all of their strengths and shortcomings. In our era of mass-communication, the media controllers and established institutions influence the national "agenda," which in turn influences much of our behaviour, expectations, and values.

Whether they realize it or not, most people are constantly manipulated through the media. If you doubt this check your public TV station for international news broadcast. Comparing that newscast to your local newscast could easily convince you that the reporting originated from different planets. One must watch with great scepticism.

Our most cherished beliefs are influenced by books, motion pictures, television, religions, role models, and the environment we live in. even notions of good and evil and concepts of morality are part of our cultural heritage and experiences. This method of control does not use physical force and has been so successful that we no longer recognize or feel the manipulation.

The dominant values of any social system rarely come from people. Rather, they represent the views of the dominant control group such as the church, the military, the banks, the corporations, the power elite, or nay combination thereof. These entities determine the public agenda, the courts, taxes, etc., all of which serve their own interests and perpetuate the illusion that society's values are determined from the ground up. Governments suppress or explain away any deviations that may threaten them.

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The fear of retribution from gods and demons is still effective at controlling ignorant and superstitious populations in both developed and undeveloped nations. Many actually believe that demons are responsible for anti-social behaviour, and that they can be cast out by rituals and incantations. According, they are unable to evaluate the effects that environment and experiences have on their behaviour. Many still believe that volcanic eruptions, thunder and lightning, and other cataclysms are manifestations of anger by gods or demons, and that inanimate objects have their own will and act on their own accord.

All human being are subject to the influences of the surrounding environment. These influences become so ingrained in our habits, thoughts, feelings, and outlooks that we actually believe what we are told. Learned behaviour is part of human nature. Even those who feel they are making their own decisions, despite their cultural indoctrination, have been influenced by their surroundings. This is why we fail to critically examine values and beliefs, and still adhere to myths, superstitions, and outdated customs which have little or no benefit for our survival. The control of nations and individuals has not been easy because we have such little understanding about ourselves and the conditions that shape our behaviour. People know less about their own behaviour than they do about the physical world around them. That is why the dominant systems of man-made laws, and the use or threat of force, have been frequently used. This technique has been tedious in its application and uncertain in its outcome. Today most of us perpetuate these conditions that may have served a purpose in earlier times, but have little relevance to today. What is needed is an intense research program to identify specific conditions and how those conditions influence human behaviour: conditions such as environment, nutritional deficiencies, family relationships, violent-media saturation and, to a limited extent, genetic makeup.

The reason a science of human behaviour has not been more widely developed is that the focus has been mostly on people and less on identifying the environmental conditions at work on the individual. The idea that our efforts should concentrate on the development of the individual alone is fallacious. You cannot identify the factors responsible for behaviour through the study of individuals alone, but rather through a study of the cultures in which individuals are nurtured. The differences between a Native American, a thief, and a banker are not found in their genes, but instead reflect the environment in which they were raised.

Many people today use genes as a scapegoat for aberrant behaviour, when the major influences have been shown to be environmental. Genetic make-up alone cannot fully explain or illuminate human behaviour. The science of human behaviour is a complex algorithm of genes, environmental conditions (food, shelter, family dynamics, education, religious, training, personal experiences), and the interpretation and decisions people make about the world and their place in it.

Language causes much of our ignorance about natural law. We speak of the sun rising and setting, rather than of the earth's rotation. We talk about plants growing, as if they grew of their own accord, and ignore the relationship of growth to water, soil conditions, and sunlight. When we use terms like "that rock is rolling down the hill," it implies that the rock has free will. Nothing we have ever observed in the physical world is self-activating. All the processes in nature are interactive. A stone does not simply roll down an inclined plane and rivers do not simply flow. Gravity acts upon them. All living and non-living systems are acted upon by resident forces.

In like manner, the same laws that govern nature apply to human beings and are prime factors in shaping values. All human beings are immersed in an environment with

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an already established system of values. It is the major and minor differences within that environment, and to a lesser extent the genetic attributes of the person, that are responsible for the uniqueness of the individual. If the conditions that established those values remain unaltered, in spite of the urging of priests, politicians, or poets, the values will persist.

Perhaps in the future in a saner culture, people will view our notions of criminal behaviour as naïve. In its most basic definition, crime is the taking of something from another without their consent. As Mark Twain once explained, there is probably not an acre of land on earth that belongs to its rightful owner. Our ancestors stole the land from older peoples who took it from others. In that sense we are all criminals, or have at least benefited from criminal behaviour.

Most man-made laws in our present culture attempt to control behaviour and values so as to serve vested interests. If we want to reduce the crime rate, we must alter the environment factors responsible for it. And we have to be clear about the behaviour. Criminal behaviour, like beauty, is often in the eye of the beholder.

In some instances crime comes about when people have insufficient purchasing power, do not identify with the direction of society, or have little knowledge of the consequences of their actions to themselves or to the environment. In regions of low population density with an abundance of food and water, there is no need to steal, and consequently no law against it. If the population exceeds the resources of the land, then what we call criminal behaviour arises as a result of scarcity, whether artificial or real. A psychiatrist once said that if he could open a drawer and give each of his patients \$200,000, 85% of his clients would have no need to see him anymore.

Today, our efforts to deal with socially offensive behaviour are both inadequate and inappropriate. Eventually it will be realized and understood that most forms of so-called criminal behaviour, which will fill jails well into the twenty-first century, have been generated by the scramble for money and property in an age of often-contrived scarcity and planned obsolescence. Four out of five of the prison population in New York comes from seven of the lowest income areas in that state.

Bigotry, racism, nationalism, jealousy, superstition, greed, and self-centered behaviour are all learned patterns of behaviour, which are strengthened or reinforced by our upbringing. These patterns of behaviour are not inherited human traits or "human nature" as most people have been taught to believe. If the environment remains unaltered, similar behaviour will reoccur. When we come into the world, we arrive with a clean slate as far as our relationships with others are concerned.

In the final analysis, any judgment about undesirable human behaviour serves no purpose absent an attempt to alter the environment that creates it. In a society that provides for most human needs, constructive behaviour would be reinforced, and people who have difficulty interacting in the community could be helped rather than imprisoned.

Aspiring to a particular ethical behaviour has to do with human aspirations and ideals. Functional morality is the ability to provide a process which achieves a sustainable environment for all people. By this we mean providing clean air and water, goods and services, and a healthy and innovative environment that is emotionally and intellectually fulfilling. It is difficult to think of solutions that would serve the interest of the majority in a monetary system. None of this can be accomplished without a comprehensive redesign of our social system and the eventual replacement of the money-based system with a scientifically managed resource-based economy.

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## NATURAL LAW

Whether we realize it or not, every human being, whether criminal or saint, is a law-abiding citizen. That is to say, we are all subject to the natural laws that shape our behaviour and values, and it is not possible for human life to exist without being subservient to these natural laws. Today, however, people think they are independent of the law of nature, and they place themselves on a pedestal. They are unaware of their dependence upon natural laws. They build different houses of worship and plead with various versions of the deity to alter the laws of nature on their own behalf. They submit appeals for deliverance from such disasters as hurricanes, flood, or droughts. The world's religious leaders and their followers cannot stop outbreaks of the flu or prevent floods or hurricanes by prayer. As long as superstition and ignorance prevail, humanity will fall short of eradicating war, poverty, and hunger. Only when humans accept the fact that they are not separate entities in the vast symbiotic process of nature can we truly say that there is intelligent life on Earth.

Some believe that certain laws of nature like the sex urge, a completely natural drive, can actually be changed by acts of Congress. So laws are enacted against certain kinds of human sexual behaviour. These laws are passed despite massive amounts of evidence demonstrating that these behavioural drives do not vanish with the enactment of such laws. It is not possible to prevent behaviour through legislation if it does not correlate with natural laws and principles. Natural law is inviolable. A human who doesn't receive proper nutrition will not enjoy physical well-being, will sicken, and will eventually die. These are fixed properties of the physical world which no amount of human legislation can change. Natural laws are well-known, yet how many people are forced to violate them because of our social and economic insufficiencies? With every increase in population the values and behaviour of cultures change. When resources become scarce, the management and allocation of them become stringent, so laws evolve that correspond to the changed conditions. We must stress again that the values, habits, outlooks, beliefs and social conduct of a given culture are determined by environmental influences.

The Earth has a built-in recycling system, an arrangement that the human race has increasingly violated. Our rivers, oceans, and water tables overflow with debris, chemical spills, and the runoff of daily living. Landfills contain mountains of toxic and non-biodegradable trash that will last for centuries. Replenishing the environment is very difficult in a world of unregulated competition. As fast as we recover a river, another oil platform is built in the sea. Just as technology is engineered for a given task, the management of the environment that supports life also requires an intelligent effort to manage the output and input systems. They must exist in harmony with the natural symbiotic process.

As nations violate the symbiotic process of nature we pay for it in the loss of arable land, environmental degradation, pollution of the oceans, territorial disputes, and wars. International agreements and laws are meaningless and counterproductive if they do not conform to the carrying capacity of the environment.

As we observe the natural world we admire the functional design and the aesthetic aspects that are by-products of function. The ingenious economy of natural evolution has produced shapes, forms, coloration, and unique configurations that appropriately conform to the environment that nurtured them.

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The laws that govern the physical world and engineered principles are universal in their application to people. What distinguishes the technical person – the scientist or engineer- from the politician or theologian is that, when confronted with technical breakdowns, the former cannot blame the opposite party or the hand of the almighty. They cannot blame the incompetence of the former administration. If they did, it is unlikely that they would ever be called upon for their services. A chemical engineer cannot avoid his or her responsibility by explaining away corrosion in transfer tubes of chemical elements. He or she is responsible for the selection of the materials used. Scientists have no way of avoiding responsibility for problems encountered. While some people shun accountability, and justify mistakes by pointing out that to err is human, most scientists and engineers seek to minimize the probability of error. Prior to building a dam or any new physical structure, for example, they conduct a great many studies in order to evaluate and uncover insufficiencies in the planning.

Unfortunately, few students learn good analytical skills. The humanities are not held up to this same scrutiny. They present vague and mystical explanations of physical phenomena. Many explanations are accepted without sufficient information or study of the subjects covered. Mystical explanations don't work in the practice of engineering or any other branch of the physical sciences. If we do not have sufficient information, our decisions and conclusions will be inappropriate. Few liberal arts courses provide a foundation for the intelligent analysis required for rational thinking. What is notoriously lacking in students' education is exposure to the natural sciences and the laws responsible for natural phenomena. In our redesign of education, we propose that intelligent analysis be a core subject in all school curricula.

It has taken many years to realize that the human being is subject to the same laws of nature that govern planets, stars, and living and non-living systems. Setting human behaviour apart from these laws is arrogant, erroneous, and dangerous.

The development of robots and artificial intelligence is an extension of the human body. Although seeming disconnected from us, the cybernated world is an advanced and objective extension of collective thinking, and of how humans relate to one another and the world we inhabit. In fact, all the hand tools of primitive tribes and their language evolved as extensions of human attributes. This same process of extensionality is expressed in our books, architecture, mathematics, and all branches of the physical sciences. This includes living and non-living systems, which are interdependent to the life process that sustains all of us.

The realization of this encompassing connectivity between living and non-living systems could enable us to outgrow our shallow self-centeredness as a species. Self-centeredness has dominated the human race for centuries.

As long as people and their governments remain ignorant of these basic principles, humanity will suffer the consequences. Today the management of human social systems is based upon antiquated concepts and primitive superstitions that serve national interests. We cannot achieve real progress towards social maturation, no matter how sincere the intent, without understanding these laws.

The survival of the human race depends on the recognition of these unalterable principles. If we fail to use these principles and continue to operate from our anthropocentric pedestal, we will be doomed to repeat the same errors over and over again.

## ASSOCIATIVE MEMORY

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As we explore human behaviour and the influence environment has on us, one question always arises: do we really think? This is a circular question that cannot be answered unless we define what mean by "thinking". Thinking is, at its simplest, talking to oneself. The term "thinking" evolved as a not wholly successful means of describing a mental process that was poorly understood at the time. Thinking is influenced by the process called associative memory. Any judgment we make, value system that we uphold, or preferences that we express, are always based upon associative memory. It is essentially reflective of the environment and the experiences we have had.

An example of associative memory would be: if we see a flower similar to a rose, but with a small dark spot in the middle, we would probably smell the flower. After all, our experience is that roses have a pleasant smell. If the odour is instead pungent, the distinguishing black spot would affect our future response to other flowers of similar configuration. We may not shy away from roses without dark spots, but we will think twice about smelling those we associate with an unpleasant experience.

Associative memory identifies objects, places, or people. The same process applies to hearing, touch smell, feelings, judgments, and opinions. All decision-making systems are based upon associative memory. This is essentially how we formulate decisions of right, wrong, good, and bad, and how we measure aesthetics and beauty. Beauty lies not in the eyes, but in the associative memory of the beholder.

To an entomologist the appearance of a spider may be appealing, even beautiful, while others may find it repulsive. If we lived in a land where everyone had a nose six inches long, those who did not "measure up" would no doubt have surgery to add to it so as to conform to the accepted norms. When an Eskimo not exposed to modern civilization thinks of transportation, it is most likely in the form of a team of dogs pulling a sled. If exposed to no other housing styles, the natives of the Amazon jungle think of a home as a thatched hut. No human being can overcome the influences of his or her environment; this includes all of one's experiences. Ample examples of this exist in our own culture;

Most of us assume the brain is a reservoir of limitless untapped information. People speak of bringing out the best and noblest qualities in humans, but you can't bring out what isn't there. This notion of the human mind is extremely dangerous and unfounded.

If an electrical engineer of eighty years ago had been handed a microchip and asked to speculate on its use, even if he were to dissect it, he would have no basis for interpreting its function. The implications and understanding of associative memory can have a profound effect on the way we look at the world and ourselves. It may even raise questions about how much freedom there is in our so-called individuality and freedom of choice.

## HUMAN EMOTIONS

Many human emotions reflect environmental insufficiency, insecurity, and scarcity. Our emotions and how we express them are to a large extent determined by our culture. Here we do not refer to emotions due to physiological reactions such as physical pain, loud noises, or bright lights. By emotions we mean patterns of behaviour that do not alleviate the problem. A less scientific but more colourful way of describing emotion in this sense is that it resembles the racing of a car's engine at a spotlight, generating a lot of energy but taking us nowhere.

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In fact, many emotions are associated with strategies for achieving self-centered ends such as the promotion of nationalism, salesmanship, seduction, flattery, and other forms of manipulation. They are used to control the actions of others.

When a car skids on wet pavement and crashes, someone may tend to the situation as best he or she can, perhaps holding the injured person's hand until a doctor arrives. We consider such a person to be a caring and concerned individual. Rarely seen or appreciated is the engineer who adds an anti-skid surface to the pavement, thus eliminating the cause of the accident in the first place. This variety of caring illustrates an emotion translated into a workable solution to eliminate the problem.

A caring society of the future will remove the conditions responsible for greed, envy, hate, revenge, and other undesirable human emotions. It will use technology to make certain emotions irrelevant, by getting rid of the problems that cause them. In a resource-based economy, when people no longer live in fear of losing their jobs or being insecure in old age, and when they have access to things that were not available to them in a monetary system, then love will not be merely a word, but a way of life. When humans learn to live in harmony with nature and with one another, then spirituality will be a way of life rather than just empty talk. In a more sophisticated and humane society emotions would be harnessed and expressed in appropriate behaviours or action patterns.

When emotions are translated into positive constructive action patterns, when they transcend the limitations of the present culture of war, poverty, and hunger that cause so many of these emotions, then they will indeed become useful. When they are harnessed so as to transcend the limitations of the present, and become expressions of deed rather than simply habitual unthinking reactions to stimuli, they will serve human beings far better.

Perhaps some day in the future, when there is peace on earth and abundance of resources available to everyone, many of the emotions that have bewildered us for centuries will abate. Anger, despair, vengefulness, envy, and depression, will perhaps even disappear, due to the beneficial effects of our redesigned culture and environment.

## 13. TECHNOPHOBIA IN A CYBERNATED AGE

THIS BOOK PROPOSES A PARTNERSHIP between scientific accuracy and imaginative projections that may lead to an age in which intelligence is no longer solely associated with human beings. Despite fears to the contrary, potential problems are not between humans and machines, but rather with the limitations of the human intellect in a time of explosive technological development.

Many people fear rapid technological developments, particularly the automated and cybernated aspects of machines replacing human beings – if not outright, then to an extent that might deprive them of their livelihood. Many of these fears seem justified by the rapid increase in production technology which requires considerably fewer workers. This trend seems to be accelerating, and contributes to people's fears of being replaced by superior systems that do not require human participation.

The basic operating concepts of a money-based system exacerbate the problem, since profit is more concern than the individual. Today, machines are not used to enhance the lives of employees by shortening the workday while increasing vacation



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time and purchasing power. Instead, industries use automation to benefit a select few, the shareholders. In this way the majority of people may very well be nonessential personnel, who have outlived their usefulness and are set aside, much as obsolete machines are scrapped today. It is not technology that is at fault, but the inhumane use of technology for private profit. Humans contribute to this misuse of technology when they buy stock in, and products from, companies that show little concern for humans or the environment.

A few computer designers today harbour the irrational fear that machines will eventually dominate people, since their designs are beginning to manifest human attributes. This is the unfounded fear of the technophobe. Machines actually care nothing about whether they turn out five thousand cars a month or five hundred. They merely function as they are designed to. They make no complaints as they toil in the hot sun harvesting crops and planning seeds without rest. They have no sweat glands or physical need for sleep.

It is because they do not have emotions that they will not conspire to enslave humans. Technophobes, with unfounded fears that computers and robots will enslave the human race and take over the world, are simply attributing human characteristics to machines. Machines do not possess human and animal characteristics like feelings, which come from hunger, thirst, sensory stimulation, experience, and internal secretions. When a computer is destroyed in the presence of another computer, there is no anger, resentment, or lust to "get even" on the part of the surviving computer. Many humans, particularly science fiction writers, project these characteristics onto machines of the future. Even when machines simulate emotions they are not genuine; they do not feel one way or another about any issue.

The fears that machines will increasingly regulate our lives, rob us of our natural instincts, and eventually threaten our most cherished values, such as our family and spiritual beliefs, are erroneous. Even though machines may provide us with rapid transportation, prefabricated abundance, and artificial intelligence, people still harbour these fears.

Some individuals distrust a computerized society and the possible failure of the machines. They feel this technology makes us more like machines, driving us towards uniformity, resulting in the loss of individuality and that which we cherish most, freedom of choice and privacy.

In defence of machines, perhaps we would be better off if people did behave more like them. There is no question that some machines are poorly designed, but the flawed natures of human beings in high places surpass, by far, the illusion of the destructiveness of machines.

There is no evidence of machines acting against human beings of their own accord, except in naïve science fiction stories. Human program machines and direct their use. It is not machines that are to be feared; it is the misuse and misdirection of these machines by people that threaten humankind. We must not forget that the bombing of cities, the use of nerve gas, prisons, death camps, and torture chambers have all been managed and operated by human being, not machines. Even atomic weapons and guided missiles are built and directed by people. People pollute the environment, our air, oceans, and rivers. The use and sale of harmful drugs, the distortion of truth, bigotry, and racial hatred are all parts of flawed human systems and false indoctrination.

Machines are not the danger: we are. As long as we fail to take responsibility for our relationship to fellow human beings and the intelligent management of our planetary resources, we remain the greatest danger to the planet. If there were ever a conflict

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between men and machines, we can be fairly certain about who would start it! It is time we acknowledge that, while there may be a moral high ground, none of us are currently standing on it. The most powerful testimony to our ignorance comes from the very scapegoats we blame for our social ills: too much technology, foreigners and minorities, "position of the planets," demonic influences, and subjective moral standards. None of these are relevant; they only serve to divert attention away from the real problems.

Science and technology have created none of our problems. Our problems arise from human abuse and misuse of other people, the environment, and technology. Downsizing is not due to machines displacing people. In a more humane civilization, machines would be used to shorten the workday, increase the availability of goods and services, and lengthen vacation time. If we utilized new technology to raise the standard of living for everyone, then machine technology would benefit all.

As the dangerous side effects of misusing technology escalate, including environmental pollution, the over-exploitation of the land and sea, and the wasted resources of war and unnecessary human suffering, there is a backlash for a return to a simpler life with less technology. At the same time, people call for a return to more humane values and a considerable reduction in the rate of technological development.

Those who nostalgically advocate a return to the "simple life" and "going back to the land" are misinformed and limited in their thinking. Imagine what would happen if we removed all the machines in people's homes: the radio, television, computer, telephone, electric light, oven, refrigerator, and heating and cooling system. We do not see such people tossing their machines out of the house or going even one week without their cars. They are people who are preoccupied with wishful thinking and irrelevancies. They are free to give up their modern convenience and move into a cave if they choose to do so. But how far back does one really want to go?

These people seem unaware of the high rates of infant mortality, women dying in childbirth, malnutrition, and death from infectious disease that were prevalent in earlier times. Any regression or return to the past would be a vast waste of human potential. Do we not instead require better means of communication, transportation, increased agricultural yield, and housing for the billions of people throughout the world?

If those against technology were able to turn back the clock in the name of vague humanitarian values, we would condemn millions to a state of permanent misery and unnecessary suffering.

A hand-tool economy in which humans spend their time providing the bare necessities of life, devoting long hours to digging wells, gathering wood, hand pumping water, and washing clothes in the river, leaves little room for the development of the individual. This also holds true for those in an industrial society on a production of parts. We are using a very small portion of the human being in these instances, and are neglecting the most important aspect of being human which sets us apart from other animals, our intellect.

One of the most shameful aspects of the twentieth century is the degree of technological illiteracy affecting millions of people, despite access to the broadest range of knowledge the world has ever assembled. Even in the United States vast numbers go through their day without the slightest idea of how a grocery scanner or a toilet works. They are only faintly aware of their dependency on dams, power plants, mass transportation, electrification, and modern agricultural science for their very existence. When they turn on a light, they give little thought to the centrally controlled power grid that links widely separated power stations by long distance transmission lines. These lines are the life force of industry, transportation, and the electrification of the society.

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Without electrical power, the telephone, air conditioning, radio, television, and computers, what we have come to accept as modern society, would disappear. Without electricity, the gas pump at your service station stops. Without refrigeration, preservation and transportation of food on a global scale would be impossible. No hospital could sustain life during surgery without machines that monitor the patients. All the leading nations of the world depend on technology for their very survival. Without modern nutritional facilities, public health would be threatened and our standard of living would be reduced to a hand-tooled economy.

In other words, it is technology that propels today's civilization. Without chemistry, agronomy, engineering, and modern health sciences, the world as we know it would not exist. Humanity would be burdened with hard physical labour and longer hours of work just to maintain the bare necessities.

Many who believe that there is too much emphasis on technology fail to see the humane aspects of science. It has actually been called "cold science," and there may be some justification for this in monetary societies when the tools of science are directed primarily toward private profit and the maintaining of positions of advantage.

Many writers and literally people who perpetuate the myth of cold science exhibit technical illiteracy and ignorance of the meaning of science. This may be due to their feeling excluded, and their being unable to grasp the real significance and sensitivity of science.

Some point out the detrimental effects of dams, irrigation canals, and nuclear power projects, but are often silent prior to the construction of these projects. In many cases, only when the projects fail do the detractors make themselves known, but rarely with a viable solution or alternative. It is not dams and power projects that should be cut out; instead it is up to us to devise more effective and practical applications to harness nature while still protecting the environment and helping to support human life.

There are always positive effects associated with all natural phenomena. Whether we view them as good or bad depends on the species affected and the effects on human civilization. When a volcano erupts dust may spread over an extensive areas choking out many forms of life; but the lava also provides new soil and fertilization for the growth of new plants. Hurricanes spread seeds in vast areas where they would not otherwise have landed; such "pollination" originally supported the lush growth on many islands. The world of the future will involve harnessing and maximizing the forces of nature and redirecting them in constructive ways that help support human life, while also protecting the natural environment.

It is possible to build dams, canals, and power plants that offer far more than they do today, while minimizing the negative effects. For example, dams can allow for the migration of fish by means of inclined steps that enable fish to ascend to a higher level, or allow for the removal of silt where needed. If we start a project with a full "map" of the proposal, we can see and prevent damage, and also adjust the design to accommodate current natural process, thus saving time and material. Computer simulation models already exist. Most major projects, however, are undertaken to fit special agendas, primarily business or special interests, without concern for the existing ecology. Much is lost in the process.

Would you trust your life to a machine? Actually, you do every time you get into an airplane or a car. Chances are you'd rather come into San Francisco airport in a thick fog guided by sophisticated electronic instrumentation than by a human pilot who can't see past the nose of the plane! And how many patients in a hospital are kept alive during emergencies by machines life support systems?

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As with many other things humans come into contact with, they often tend to personalize the machine. Humans can become emotionally involved with their machines, and even brought to tears or anger over them. People in a motion picture theater watching animated pen and ink drawings can identify with the characters and laugh or weep over these nonexistent entities;

People often refer to their automobiles as their "babies." Boats are referred to as "she." Many a husband, when told by his wife or teenager, "I've had an accident," inquiries first, "ho badly was the car damaged."

Since the advent of the personal computer, machines have become so ingrained in the lives of many that they depend on the computers not only to support their livelihoods, but also to support their mental state as well. Computers become extensions of themselves and sometimes unknowingly their best friend. Computers don't argue or become indignant or jealous, and they don't react to insults. Sitting at a computer keyboard, users may indulge their wildest fantasies without having to deal with the hassles of personal contact. The personal computer has become an essential and very extensional part of their lives.

The technological revolution is here to stay and will eventually, whether we support it or not, free people from the never-ending struggle for security. Computers have already invaded our schools churches, and the highest offices of government, but they do not intend to enslave or regiment the human race. They are in some respects kinder to us than we are to ourselves.

We need more technology, not less. But we need a new kind of application of technology. If technology were managed intelligently and with human concern, it could be used to overcome scarcity and liberate millions of human beings from the scourges of poverty and social insufficiency.

Rather than consign humanity to eternal slavery to machines in a monetary wage system, we should allow machines to free human beings from dangerous, boring, or meaningless jobs. Far from being the threat feared by technophobes, machines could be liberators, providing us the time and the resources to help us learn what it means to be a human being and a member of the world community.

## 14. EDUCATION: MINDS IN THE MAKING

THE MORE INTELLIGENT OUR CHILDREN, the better our lives and the richer our culture will be. Every child using drugs and living a life without direction and purpose is damaged life that we will have to pay for into the future. It is our children who will inherit the future. With the proper information and nurturing, they will understand that Earth is a fantastic place capable of providing more than enough for the needs of everyone.

The development of a new civilization involves not only the construction of new cities for living, but also the building of positive and caring interpersonal relationships. The young and old of this new civilization will learn to live in harmony with one another. Education plays the most important role in achieving this goal, particularly in children.

The subjects studied will be related to the direction and needs of this new evolving culture. This new curriculum will emphasize the generalist point of view and the introduction to general science. Students will be made aware of the symbiotic relationships between people, technology, and the environment; they will have a better

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understanding of the evolution of cultures and the application of advanced technology to this new social design.

Schools of tomorrow will teach children to be analytical. Students will study the interrelationship of life, rather than discrete and unconnected subject matter. The focus will be on the interrelationships of humans with Earth and with each other. Early education will emphasize understanding and cooperation.

In the redesign of education, the first questions asked are: what ends does education serve? And in cybernated world society, how do we determine the direction of education? Some goals might be:

1. Working toward regarding the world's resources as a common heritage.
2. Transcending the artificial boundaries that separate people.
3. Replacing the monetary economy with a resource-based world economy.
4. Reclaiming and restoring the environment to as nearly a natural condition as possible.
5. Redesigning cities, transportation systems, and agricultural and industrial plants so that they are energy efficient, clean, and serve the needs of all people.
6. Outgrowing political governance, whether at the local, national, or supranational levels, as a means of social management.
7. Sharing and applying new technologies for the benefit of all.
8. Exploring, developing, and using clean renewable energy sources such as wind, solar, geothermal, and tidal power.
9. Utilizing the highest quality products for the benefits of the world's people, while eliminating planned obsolescence.
10. Focusing on interpersonal skills to improve relationships.
11. Requiring an environmental impact study prior to construction of any mega projects.
12. Encouraging the widest range of creativity and incentive toward constructive endeavours.
13. Stabilizing the world's population through education and voluntary birth control, in order to conform to the carrying capacity of Earth.
14. Eliminating nationalism, bigotry, and prejudice.
15. Phasing out any type of elitism, technical or otherwise.
16. Arriving at methodologies through careful research rather than random opinions.
17. Enhancing communication so that our language is more relevant to the physical conditions of the world around us.
18. Providing not only the necessities of life, but also challenges that stimulate the mind, while emphasizing individuality rather than uniformity.
19. Finally, preparing people intellectually and emotionally for the changes that lie ahead.

Ultimately, these goals determine the direction education will take. If we decide to explore the moon's surface or dig a tunnel under the sea, we must first build an organization dedicated to that goal with the capabilities to accomplish it. To develop a civilization that provides a higher standard of living for all and eliminates war, poverty, and hunger, society must adopt goals that can accomplish these ends.

With a resource-based economy education would stress a cooperative world enterprise in which individuality, creativity, and cooperation would be the norm rather

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than the exception. It would be free politics, folkways, and superstitions, and would encourage the widest possible innovative thinking.

In the schools of a unified world civilization, classrooms could provide information about human behaviour and the forces that shape our culture and values. All students could have access to information without restrictions of any kind. Individual ideologies would remain as a set of tools and as an associative framework, but would undergo self-modification and growth with new information and experiences.

What would likely be perplexing to the citizens of the future is why there was, in the past, only one Edison, one Pasteur, one Alexander Graham Bell, one Tesla and, in general, so few others of their calibre: why was it that so few original minds managed to emerge from the billions populating our planet?

Imagine a world where thousands of such individuals live and prosper at the same time, thinking and creating to their full ability – a world in which most human beings actively participate in the improvement of Earth's conditions instead of simply toiling to make a living.

People of the future may find it incredible that leaders of independent nations and industries could not grasp the possibilities of a social system of cooperation rather than of competition.

We desperately need a saner mode of civilization that no longer divides humankind. Residents of new networked communities would be educated from birth to consider themselves planetary citizens, without sacrificing freedom and individuality to any form of totalitarianism.

## SCHOOLS OF TOMORROW

Education will undergo considerable improvements. Children will be given time to explore their own interests while also participating in cooperative behaviour and interaction with other children and the environment. Hands-on experiments and tours of the natural environment, production plants, and other industries will provide ongoing laboratories of learning.

The learning environment would encourage actual participation on simplified levels. Younger children would plant seeds in soil, irrigate, fertilize them, and record their growth, as is presently done in many schools. Actually participating in plant and animal development alters forever a child's view of nature and enhances their comprehension of the way nature works, and how its many and varied functions interrelate with each other. They will see that nature is a symbiotic process and that no single thing enables a plant to grow. They would see that a plant cannot grow without radiant energy from the sun, water, and nutrients, and even that gravity plays a major role in the process.

Children would understand that each individual can take an idea only so far. Others invariably add to it and improve upon it. Each contribution motivates and encourages others. Ideas grow and expand like crystals into varied and complex patterns. With a better realization of our interdependence on one another, self-centeredness gradually disappears.

Patriotism and national pride, which tend to obscure the contributions of other nations, would no longer be relevant to a new emerging culture. The children could learn, for example, that six hundred years before Christ the Arabs developed the electric battery. A thousand years before the Wright brothers launched their first flying machine at Kitty Hawk, the Chinese developed man-carrying kites. A Russian named Tsiolkovsky

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was first to describe in detail the principles of space flight. A Frenchman, Louis Pasteur, developed an inoculation against rabies. In the sixteenth century, the Italian Leonardo da Vinci envisioned the principals of flight and designed a rudimentary form of the helicopter. The Polish astronomer, Nicolas Copernicus, published his book on the revolution of the celestial bodies. Albert Einstein, a German, gave us the theory of relativity. The contributions of all nations made our standard of living possible and enriched our lives. But we still are only at the threshold of the future.

Students would learn that no single nation has all of the answers nor an answer for all situations. Society is in a constant process of change. Students would understand that there are no final frontiers. They would also realize that each phase of society will evolve a set of values appropriate to that time. All values, including many of the postulates of science, must be utilized as the best tools available at the time. With the advent of additional information and more sophisticated tools, our notions about the nature of the world could be constantly updated. Science would be taught as a set of known facts and applications that are subject to change as more information becomes available not as a set of immutable rules and laws.

Children taught through cooperative participatory hands-on experiences develop better socialization skills and self-confidence. Instead of rote learning, our new schools could provide opportunities for children to improve their interaction with one another in real life situations. In other instances students may choose to explore independent interests by selecting their own curriculum. If they prefer, they would be assisted by counsellors or artificial intelligence machines, which would convey information through words, diagrams, visual displays, and many other methods. Our new schools will accommodate the many varied ways in which children learn.

Education would emphasize humane values and communication, an essential process to improve the interaction and communication between people of all races, colour, and creeds. Both children and adults can learn to outgrow the self-centeredness that dominates the behaviour of many today. A new form of education could make abundantly clear that our likes and dislikes are based upon our present culture, and that our visions of the future are always culture-bound.

The children would visit farms, power plants, production facilities, and resource centers, and could actually take part in managing and planning their own affairs. Each child could experience leadership by planning activities, and these responsibilities could be constantly rotated so that each student would gain the experience.

To improve the mental condition of all our children, we must not only educate them through books and other visual aids, but also through games that are both physically and mentally stimulating.

The Children's Centers would be equipped with books, computers, and a wide variety of visual aids. At these learning centers, the games children play would be relevant to the needs of the child and the emergent culture. Today, far too many of the games available to our children depend on competition and encourage hostility.

The game of chess does not generate creativity in other areas; with practice, strategies for chess may be enhanced but that does not enhance creativity beyond that game. This game takes a tremendous amount of effort to learn but is about nothing in particular. If this same effort were applied to games that improved one's understanding of nutrition, health, and disease-control, it would be far more beneficial for the player and for the society. People consider chess a challenge, but its significance is equal to that of a beauty contest. What games will be available in the future?

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Consider a game centered on a virtual image of Earth. As children touch various areas of the Earth they could learn about the geography and languages of those areas. With laser indicators pinpointing specific areas, they could interact with and receive relevant information about any aspect of a geographical area. This could be done with as much fun and challenge as are provided by the games played today, without the need for outsmarting other players.

Others games can connect information about the physical world to needs of individuals and society. There can be games to enhance one's mathematical abilities. Skeletal structures of humans and other animals, when touched, can verbally identify structures and organs teaching anatomy and physiology. The study of plants and other physical phenomena might be similar. Other games will encourage creativity. In an environment of creative games, associative memory and the experiences gained form the basis of creative thinking. To think is to make a correlation, and it is the relevance of the correlation that counts. Imagination is based on cumulative experience. The broader the background, the more a person brings to a subject.

People of the future would be encouraged to engage in constructive diversity. Even nursery children could participate in games to develop flexibility, individual initiative, and creativity, along with a high degree of self-sufficiency. If they were told that four and four were eight, they would probably reply: "Eight what?" If two drops of fluid are suspended in an acoustical chamber we can, by sonic means, convert two drops, or one drop to four drops. All numerical relationships in the future would be structured within a given frame of reference. Today children are not taught how to ask question and examine ideas. Education consists primarily of rote learning, of simply memorizing concepts and propaganda. Children of the future will not be satisfied to accept ideas without an in-depth exploration and understanding of them. If a child of the future were told that the country they lived in was the greatest in the world, they might ask "How so?" and "Compared to what set of standards?" Free minds of the twenty-first century would challenge everything – and most would, in fact, be experts at changing their minds.

At an early age children could be exposed to social and cultural anthropology. They could also be exposed to the history of civilization and the history of technology from bow and arrow to the space age.

Rather than trying to instill in them a sense of self-worth through moral lectures, we could urge children to develop the necessary skills to further their inquiry. Education in the future could utilize and harness the natural curiosity of children. The children would not, however, get instantaneous fulfilment of their requests. This tends to diminish incentive and makes it almost impossible for them to live without immediate gratification. For example, if a child asked a parent to build a model airplane the parent could say, "I will teach you know to build one." This helps the child appreciate his/her own accomplishments, and improves their sense of self worth. As this process continues, the child will develop greater self-sufficiency and depend less upon others.

Children find animated toys exciting and interesting. In the new schools they could develop their own animated toys. Before they actually build these models, they would be instructed in the necessary crafts. As they develop skills in working with tools for soldering, wiring, bonding, and fabricating, they can actually see and use the results. This would give them an appreciation of the effort that is required to make items they might otherwise take for granted. They could constantly learn to apply high safety standards while working with simple, and eventually, more complex machines.



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Students could learn how to design and draw the models they intend to build both by hand and by computer. Science, mathematics, art, written communications, and interpersonal skills come into play in this single task. Once a project is completed, the students will better understand the relationship between the blueprint and the materials required for completing a project. Mathematics would be taught as part of the design initiative in the building of these projects, so that there is a physical reference for numerical systems. In this more advanced system, it should be easy to transfer these principles to other areas of creativity within the arts and sciences. Through this process, students will be able to grasp the relationship between nature, technology, and civilization.

If we want children to achieve a positive constructive relationship with one another and become contributing members of society, we must design an environment that produces that desired behaviour. For example, when the children are interested in learning to assemble a small motor vehicle, the design might require four children to lift the car while two others attach the wheels. The rest of the car would be assembled in a similar manner, needing the help and cooperation of everyone to complete the vehicle. This enlightened form of education would help students understand the advantages of cooperation.

Exercise in our school would not be mandatory, monotonous, or involve adversarial competition, but would be incorporated into the classroom experience. A craft shop the children enjoy using might be located on a hilltop in the middle of a lake. To get there, the children would have to row a boat or swim, and then climb the hilltop. This not only provides exercise, but also a sense of achievement, which helps their mental health and incentive.

There are simplified examples of complex processes and ideas which should be considered for our redesign of education.

Much attention would be given to emotional development. This would involve learning to interact effectively with others, share experiences, examine alternative approaches to problems, and allow for cultural and individual differences. This could reduce personal and interpersonal conflicts considerably.

Children will learn to modify their approach to get their point across, employing reason and restraint rather than name-calling or raising their voices. They would learn how to honestly disagree without bitter feelings. Judgmental terms like "right" and "wrong" would be avoided and phased out. They would have more refined vocabulary and understand terms such as "a closer approximation of reality." Their vocabulary would also be factually meaningful, and not just a purely emotional expression. A relevant vocabulary will describe the situation factually. For example, "The inclined ramp is too steep for elderly people," will be said rather than an emotional remark like, "A moron must have built that ramp." In other words, the child will learn that descriptive and constructive language is more likely to improve the situation than outright criticism.

Education would be participatory. Students would work cooperatively as teams. For example, if a class-group were hiking through a wooded area and came to a stream, one of the children might say to both adults and peers, "I have an idea, and I'd like to hear what you think about it." With this exposure children will listen and ask questions. Rather than being met with phrases such as "that will never work", students and instructors could submit ideas to the class and test the validity of their proposals, receiving suggestions rather than just criticism.

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These young people would willingly interact with the environment, taking an active role in hiking, exploring, and instigating natural phenomena. The environment would be structured to deliver the best in nutrition and health. Most importantly, when confronted with an unfamiliar question or situation, not only would they know where to look for appropriate information, they would know the appropriate questions to ask, and how to ask them.

Most children in our culture do not learn to describe physical processes adequately because they do not have a vocabulary equal to their physical abilities. They are not encouraged to formulate such descriptions in their daily lives; therefore that do not develop an appropriate, descriptive language. There is an old truism that says: Once one can correctly state the problem a solution is not far off."

When children grow up having a physical reference for the words that use, that will provide them with a more realistic understanding of the world and their relationship to it. Utilizing these methods, a child will gain skill in problem solving that may be utilized in different situations in the future. Rather than acting from an emotional or uninformed standpoint, they would ask, "What is the nature of the situation?", or "What do we have here?" This unique education will help children become creative and participatory members of society.

Children would learn that it takes many experiments and a great deal of effort to solve problems. Through this process they realize that, although they may fail initially to achieve what they set out to do, this is an acceptable part of human experience. They would learn that, in medical research and other fields, it sometimes takes thousands of unsuccessful experiments before arriving at a solution. Even experiments that fail often function as essential steps in the process of achieving a goal. Sometimes other discoveries emerge along the way. Children would learn not to get discouraged with failures, and that they are an inherent part of all research and development. Few of our schoolbooks detail the long tedious work required to invent an object like the light bulb. No single individual manages one great leap in technology or science without first taking several strides. Each invention is a result of a series of progressive refinements, one upon another. Every success results from the failures and success that have preceded it. Unfortunately all too often our romantic notions and egos obscure this understanding.

The serial progression of creativity can easily be verified if we examine the history of invention. This same process applies to the arts and sciences.

Children will come to understand that no single entity, living or nonliving, is self-activated. This concept is referred to as the mechanistic point of view. For example, a ball does not simply roll down a hill: it is acted upon by gravity. The heat from the sun is generated by a nuclear furnace; this furnace is set in motion by immense pressure. A child will ask what makes an airplane fly, as though there were a simple answer. They ask, "Is it the propeller?" No, it requires an engine to turn a propeller. They reply, "Is it the engine?" No, the engine requires fuel. They say, "Oh, is it the fuel?" In other words, there are many interacting principles at work, involving both aerodynamics and physics. All things are acted upon by residents forces, from a single cell to the cosmos in its entirety and, as noted previously, even human behaviour.

Children will learn that the assumption of a beginning or an end is fictitious assumption. This concept is a carryover from earlier civilization's attempts to account for the nature of events in the physical world with very limited information.

Our redesigned education would be free from the influence of moribund institutions, corporate or self-interests, or any indoctrination of a political, national, or religious nature. Similarly, the educational system would be a continuous seamless process, with

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the degree of each individual's curiosity enabling them to progress to the next level without grading.

Such an education would not only emphasize science and human behaviour. It would also provide students with the necessary and changing professions required to maintain social and individual growth and stability in a resource-based economy. This education would enable students to engage constructively with all members of society, and also have the ability to engage in international communication.

Some examples of future professions are mathematics, nanotechnology, nuclear engineering, nuclear chemistry, automation, cybernetics, systems engineering, systems analysis, remote control technology, 3-D virtual prototyping, design of plug-in components, computer-aided design and engineering, micro-machined electronic and mechanical systems, motion control, photochemical machining, ocean sciences, automated data acquisition systems, mariculture technology, simulation technology, life sciences, ecology, sociology, behavioural sciences, advanced plasma technology, industrial design, prefabrication technology, medical and bio-engineering, nutrition and health, soil enhancement systems, recycling of waste products, space science, terraforming technology, behavioural sciences, and others for which we have no name or knowledge today. Other professions will disappear in a non-monetary, resource-based economy: banking, law, sales, advertising, investment brokering, real estate management, and others concerned primarily with the use of money, property, and debt.

As a student progresses from the formative stage of development to the application phase, universities and colleges of the future would guide students to achieve skills relevant to an emergent society, and also encourage them to experiment in ways that would solve the social problems that remain.

In the lifelong process of education, all age levels could live in cities that could be designed and operated as university cities. Universities today are designed to provide the most advanced opportunities to facilitate education in the arts, science, music, etc. The cities of the future would be an extension of this process for fulfilling human needs. They would serve as living universities while constantly updating information.

Much education today consists of a high degree of specialization, which tends to give a person tunnel vision and a narrow perspective about the actual interrelationships of all physical phenomena. Today it is even difficult for one schooled in sociology to communicate in depth with members of different professions. Students of the future would be encouraged to view the world in a more holistic manner; accordingly, they would be able to converse intelligently across various disciplines.

Children brought up in a practical working environment of cooperation, sharing, and understanding will absorb and learn concern for fellow human beings, reciprocating warmth and love from the people extensional to them. When the environment is intelligently and humanely managed, the system and the individual are mutual beneficiaries, each reinforcing and rewarding the other.

In a resource-based economy, children will live in a world with values far different from today's. As a result of this education and environment they will possess a flexibility of attitude and mind that will enable them to evaluate new and different ideas. The earlier the exposure to science with human concern, the better prepared children will be to take their place in the cybernated world of the near future. **Science and education, when devoid of a social conscience or environmental and human concern, are meaningless.**

## 15. CITIES THAT THINK

### ARCHITECTURE IN AN EMERGING CULTURE

WE RECOMMEND THAT ARCHITECTURE also be redefined to fit the needs of an emerging future. The questions we should concern ourselves with are: "What ends are these new cities to serve?", and "What are the prime considerations in designing a place of residence?"

In simplified form, a home is any enclosure that protects people from varying weather conditions and provides for most of the occupant's primary needs: a place to rest, sleep, work, and carry out the business of ordinary living. We presently think of a shelter or dwelling as a suitable structure fabricated of wood, steel, concrete, and glass or a combination of materials. We envision a structure with windows for light and exterior walls for privacy. We install bathrooms for sanitary purposes. We utilize electricity for heating, air-conditioning, and so forth. Our notions about a home generally reflect these limited concepts.

Historically dwellings took many forms. People sought shelter from the weather in caves. Others used wigwams, lean-tos, and floating habitats. All manner of materials were utilized including bamboo, clay, the sides of cliffs and hills, domes of ice, and countless others. Today people are seriously considering colonizing the sea and outer space. Since shelters take so many forms, we have to broaden our concept of shelters. Although one does not ordinarily think of a diving suit as a shelter, it protects the wearer from the immediate surroundings, that is, from the hostile element of the sea. A space suit provides similar protection. Such suits enable people to function in environments that do not ordinarily support life. From body enclosures to single dwellings, multiple dwellings, and eventually to total enclosure systems in which an entire city works together as a single organism, this could be the evolution of shelters.

In times to come, people may be shielded from the effects of weather by electronic means. The furnishing of future dwellings may consist of totally different configurations that automatically adjust to our body contours. Newer technologies may render walls transparent so that occupants can view the surrounding landscape without anyone on the outside being able to see in. Daylight could be softened and subdued according to the preference of the occupants. These buildings could provide a barrier to sound, insects, and dust, and also maintain a desired internal temperature. The telephone of the future might not have the appearance we are familiar with: it may be entirely invisible and a component part of the interior structure. It may focus sound to the location of your ear by electronic means. The building's materials may be energy generating and control the surrounding climate.

If we look upon such a dwelling with our present habits of thought, it appears unfamiliar and very different from what we are accustomed to. It may even appear surreal to some. It is not that this new residence does not resemble a home as one knows it; but it is foreign to our concept of what a home ought to be as we understand it. We conceive of homes within the restrictions of our habits of thought and indoctrination.

In times to come, definitions of things in the physical world will not be restricted to appearance only, but will include the functions they serve as well.

## THE BEST THAT MONEY CAN'T BUY BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

While some advocate modifying existing cities, and spend lots of time and resources attempting to update them, we find such attempts inadequate. Modification carries a large price in dollars and sustaining resources. Modifying and building onto what we have means supporting older infrastructure and energy needs, the high cost of operation and maintenance thereof, the overall inefficiency, and the detrimental effects on the occupants. It is less expensive to build newer cities from the ground up than to restore and maintain old ones, just as it is more efficient and less costly to design a flexible state of the art production method than to upgrade an obsolete factory.

To end pollution and waste and still keep parks, playgrounds, art and music centers, schools, and health care for all without a price tag, profound changes are required in the way we plan cities and conduct human affairs.

The innovative multi-dimensional and circular cities we propose use the most sophisticated resources and construction techniques. The geometrically elegant circular arrangement, surrounded by parks and gardens, is designed to operate with a minimum expenditure of energy in order to obtain the highest possible standard of living for everyone. The city would use the best clean technology in harmony with the local ecology.

The design and development of these new cities emphasize the restoration and protection of the environment: in our view, technology without human concern is meaningless.

In a resource-based economy the circular arrangement employs a systems approach, efficiently applying resources with energy conservation, ease of fabrication, and relative freedom from maintenance. Assembling entire cities with standardized basic structural systems prefabricated in automated plants, and often assembled on site, is the most feasible way to provide a high standard of living for all within the shortest possible time. This method permits flexibility in design and takes advantage of interchangeable units. Cities would have new and different appearances depending on their function. Each would be unique. This approach does not reduce people to a subsistence level; rather, it makes available all the amenities that modern science and technology can provide. Even the wealthiest people of today could not achieve a standard of living equal to that of a resource-based economy.

Prefab modular units could converge on a building site to facilitate automatic assembly. The electronic could be an integral part of the modular components, each one easily connected to existing power supplies if the buildings are not already entirely self-generating. Construction would be prescheduled to minimize interference with ongoing traffic.

The geometry external appearance and total configuration of tomorrow's cities would be a direct expression of the functions they are designed to serve. The city is an extension of human activity in complete harmony with the surrounding environment. These new cities would serve as universities. Each would be designed to carry out specific integrated functions, and yet be flexible enough to permit changes for new and innovative installations. The size of the cities would vary depending on their geographic location and use.

In planning new cities, computers would help determine parameters based on the most appropriate design to meet human and environmental needs. These designed environments could permit the widest possible range of individuality and creativity for the inhabitants.

We are often asked, "Who will direct and program this cybernated city system?" No-one will. The major difference between today's computer technology and the system

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we recommend is that our system extends an "autonomic nervous system" (environmental sensors) into all areas of the social complex. They would coordinate a balance between production and distribution and operate a balanced-load economy. Decisions are made on the basis of feedback from the environment.

For example, in the agricultural belt electronic probes embedded in the soil automatically inventory the water table, soil conditions, nutrients, etc, and act appropriately without the need for human intervention as conditions change. This method of industrial electronic feedback could be applied to the entire system.

Another difference we propose is reworking the concepts that drive our production planning. Instead of large in-house facilities that create standardized products with limited application, we propose production during the act of delivery. For example, transportation modules for ships, trains, and planes could process time-sensitive products like fish and vegetables while en route. Building materials that retain an element of fluidity would lead to the creation of indestructible houses, music centers, art centers, and multi-purpose building in a variety of shapes and sizes.

The new city would provide a total environment with clean air and water, health care, good nutrition, access to information, and education for all. The city would have art and music centers, fully equipped machine shops, science labs, hobby and sports areas, and manufacturing districts. This technology is inevitable. Waste recycling, renewable and clean power generating systems, and other services would be managed by integrated cybernated methods. Life styles and personal preferences are totally selected by the individual.

Some of the cities would be circular while others may be linear, underground, or constructed as floating cities in the sea. Cables and satellite positioning could prevent drifting for sea-borne cities.

Eventually, many cities may be designed as total enclosure systems, much like a cruise ship outfitted for a six-month cruise. They would contain residences, theatres, parks, recreations, entertainment centers, health care, educational facilities, and all the requirements of a total living environment. Everything built in these cities would be as near to a self-contained system as conditions allow. In northern locations some could be partially underground.

Underground or subterranean cities of the future could be total-enclosure dome systems. One purpose of the first subterranean mega city might be to research the possibilities of sustaining life form on inhospitable planets. Many underground cities could be built in inhospitable regions of our planet. They can provide an ideal climate year round with lush gardens and waterfalls. In other words, they could supply all the benefits of subtropical environment in a very cold one. Some of these cities would be self-sustaining and possibly use energy from geothermal sources.

The future will discover newer materials and methods, resulting in different expressions of structure, form, and function, consistent with an evolving and changing world. The new materials will probably serve multiple purposes. They could be lightweight, high strength, and low maintenance, with acoustical properties not found in today's structures. These newer materials might combine all of these factors as a part of the structural components.

Some new structural materials may be sandwich-like and semi-flexible, with an inner foam core and a glazed ceramic outer surface permitting expansion and contraction without fracture. They will require no maintenance. Their thin shell construction can be mass-produced in a matter of hours. With this type of construction, there would be minimal damage from earthquakes, hurricanes, termites, and fires.

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Windows could electronically shade or darken external illumination, and come equipped with computer-controlled automatic cleaning systems that require no human labor.

Combining innovative technologies makes it possible to conserve resources for lesser-developed regions without sacrificing any of the conveniences of advanced living. It is only through applying innovation that our goal of high standard of living for the entire human race can be achieved.

We have no shortage of material. The misuse and waste of resources by our money-oriented society create artificial scarcity.

When we see a city as a biome that grows and adapts, requiring energy, food and water, disposed systems, and arteries for transportation of goods and people, our ideas of space and permanency change dramatically. Our present haphazard growth patterns reflect available space and access rather than cohesive planning. Joining the city elements together in a predetermined way conserves energy and provides easy access to all portions of the city. The prefabricated elements that comprise the city would be designed to permit modification as needed. With the introduction of newer materials, the city design can be continuously updated, while taking into consideration new technological and structural progress and evolving human patterns. All systems would be of an emergent nature and constructed to allow the maximum latitude in accommodating change. This could permit the city to function as an evolving integrated organism rather than a static structure.

Industrial construction could be automated through the use of continuous frame structures of metal, glass, plastic, and reinforced pre-stressed lightweight concrete. These would probably be selected as universal units for constructing factories, educational facilities, harbour systems, etc. Mega-machines could construct entire buildings using computerized pre-programmed instructions, reducing construction time considerably. This programming could be readily to fit changing conditions.

The architecture and individual dwellings of the future will evolve in a completely different manner from today's structures. With the intelligent application of humane technologies, we could provide a wide range of unique individual homes. Structural elements would be flexible and coherently arranged to best serve each individual. These pre-fabricated modular homes, embodying a degree of flexibility inconceivable in times past, could be built in any place one might imagine, such as forests, atop mountains, or on remote islands.

These dwellings can be designed as self-contained residence with thermal generators, heat concentrators, and photovoltaic arrays built into the skin of the building. Thermo panes can tint out bright sunlight with variable patterns of shading. These features can be selected by the occupant, and they can supply more than enough of the energy required to operate the entire household.

Buildings may also contain a precise combination of dissimilar metals utilizing the thermocouple effect for heating and cooling, as well as other materials embedded in solid state plastic or ceramic structural materials. The warmer it gets on the outside the cooler it becomes on the inside. The application of this principle can heat or cool the buildings. The interiors of homes would be designed to suit the preferences of individuals.

## TRANSPORTATION

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In the new cybernated cities of the future, personal travel to distant locations may be less attractive because of the many interesting events, options, and activities immediately available near home.

When travel outside the city is desired or necessary, computer-guided vehicles for land, sea, air, space, and beyond could transport passengers and freight. With the adoption of integrated transport systems, passengers and freight would be moved with a minimal expenditure of energy.

For rapid movements of passengers on land across viaducts, bridges, and tunnels, high-speed mag-lev trains could span great distances and replace most aircraft transportation. Some of the passenger compartments in the transport units can be lifted from the moving train while in transit, eliminating waiting time at stations. Rail, sea, and undersea craft could handle most freight. Many of the transport units could have detachable components and contain internationally standardized which could be easily transferred.

In the cities escalators and elevators, as well as conveyors and transveyors, move in all directions and are interconnected with all other transport systems. A circular route around the outer perimeters would connect conveyor systems to radial and vertical extensions, making it possible to travel to any part of the city quickly. Future cities can be designed to accommodate all transport systems for the convenience of passengers and freight alike.

Smaller transportation units for people could be operated by voice control. When voice control is not practical or possible, alternative methods such as keypads could be used. Transportation systems would be modular, continuously updated, and provided with the latest developments in technology.

The transportation system within the cybernated cities of tomorrow extends to homes as well. Although goods and services would be readily available in the city center, people could, if they chose, access materials and information from their places of residence.

## CONSPICUOUS WASTE

If our civilization is to endure it must outgrow conspicuous waste, including the waste of time effort, and natural resources. This may be seen in any number of areas. At one time architectural adornments were an integral part of construction. The lofty columns and colonnaded porticos of ancient Greece and Rome were necessary components of their structures. With the advent without columns or other intervening support structures. Yet the designers of many of our government buildings, including the Capitol in Washington, D.C., engage in the conscious withdrawal of efficiency in favour of designs felt to be impressive, but which actually reflect mere convention and artificiality.

Designing a building with many projections of artificiality does not indicate originality, creativity, or individuality. Individuality is expressed in our unique way of thinking about ourselves and the world around us, not in our external appearance. Designing buildings with conspicuous waste an decoration lessens the standard of living for others.

This is not detract from the beautiful structures created in the past with the available and limited technology of the times. However, the continuing use of ancient methods of construction retards the innovative and creative thinking necessary in an



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emergent culture. The intelligent use of resources incorporated into structures will considerably simplify our lifestyle and reduce waste and maintenance.

These new cities will provide, in an energy-conscious and pollution-free environment.

In human systems evolution has distributed eyes, senses, and internal organs in a fairly uniform manner. The same is true for other plant and animal species. Uniformity is not necessarily a bad thing if it functions towards a satisfactory end. The dangers of uniformity are evident in our inability to shrug off useless values or methods which have outgrown their usefulness. Perhaps the only uniformity acceptable in the future will be protection of the environment and concern for our fellow human beings.

We have to ask ourselves what kind of world we want to live in the choice and responsibility are ours.

## HOLISTIC CONSIDERATION IN A RESOURCE-BASED ECONOMY

In a resource-based economy holistic considerations are an integral part of overall planning. A careful investigation of the positive and negative effects of each project must be scientifically analyzed before any project is undertaken.

The cities we propose offer the possibility of tremendous intellectual growth with an emphasis on environmental and human concern. These cities would be free of noise, pollution, most crime, and other deleterious conditions associated with cities of today.

Of course people will be free to live wherever they choose. But these cities are planned with plenty of open country, parks, and wooded areas. In the areas for individual housing there will be enough vegetation and trees between houses to impart a sense of privacy.

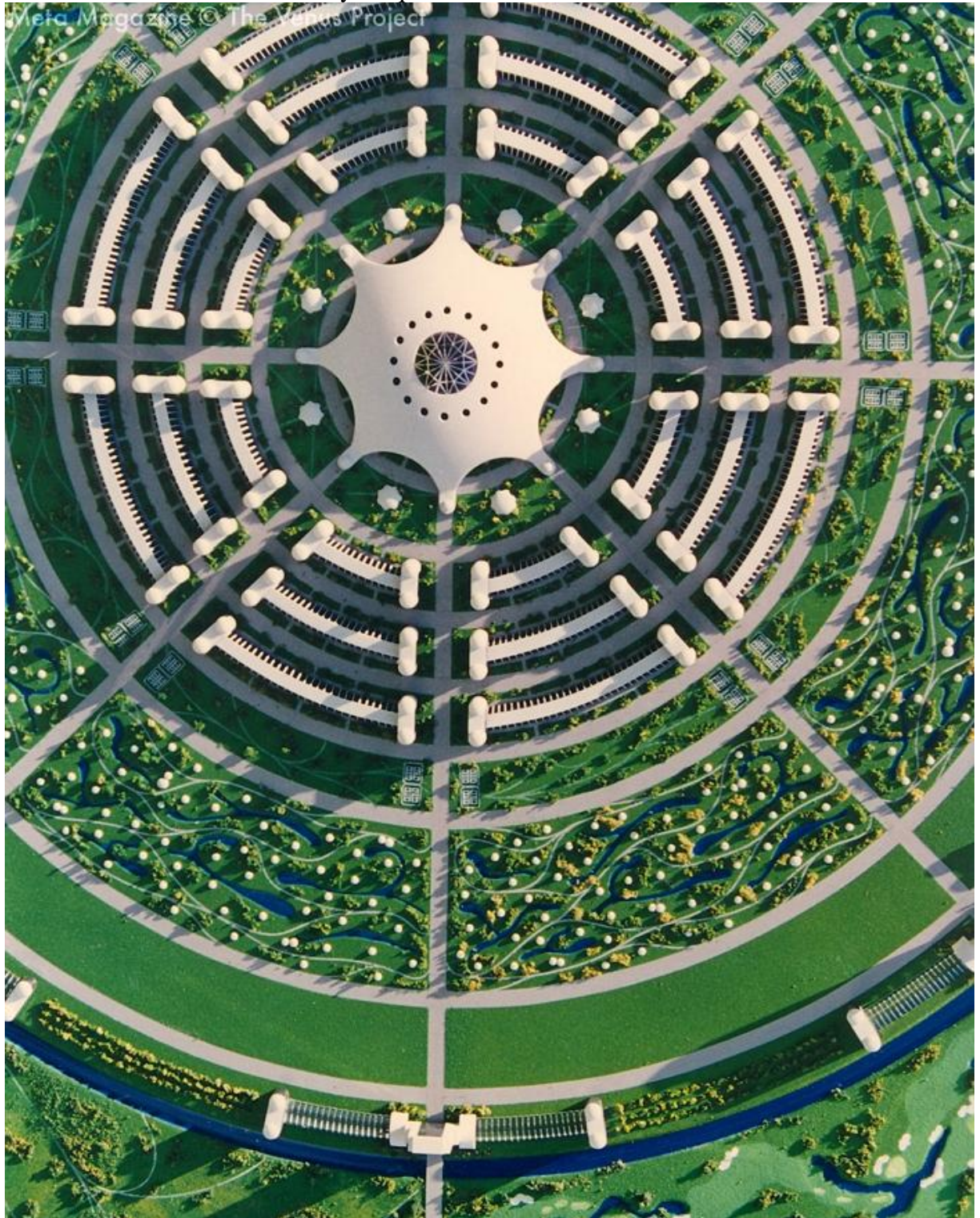
At first glance our proposal for a city of the future may appear impracticable, yet it represents an achievable, sustainable, and sophisticated environment that is designed to bring out the best in human potential. These cities will not only provide resources and information, but the best in human potential. These cities will not only provide resources and information, but will be university cities of continuous growth designed to encourage individuality, creativity, and cooperation, with concern for the total person.

The transition to this social arrangement will not be an easy one. Never in human history has there been a smooth transition from one social system to another. Any major change engenders resistance. The most effective way to implement change is through the use of worldwide media, seminars, and workshops during the initial design stage.

In the final analysis talk proves little. Since all new ideas go through a process of maturation and development, we expect our experimental City of the Future to gradually gain acceptance by fulfilling its promise as a successful, peaceful, and desirable place to live. As newer communities develop and become widely accepted, they will provide the basis of a new society through a process of evolution rather than revolution.

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CIRCULAR CITY

The outer perimeter will be part of the recreational area with golf courses, hiking and biking trails, and opportunities for water sports. A waterway surrounds the agriculture belt with its enclosed, transparent buildings. The application of newer technologies will eliminate, once and for all, the use of dangerous chemicals and pesticides. Continuing into the city center, the eight green sectors provide clean, renewable sources of energy with wind, thermal, and solar energy devices. The



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residential belt features landscaping, lakes, and winding streams. The homes and apartments will be gracefully contoured to blend in with the landscape. A wide range of innovative architecture will provide many choices for the occupants.



## CIRCULAR CITY

Adjacent to the residential district, a wide selection of healthy, organically-grown food will be available on a 24-hour basis. Next are the apartments and design centers, which surrounds the central dome. Eight domes house the science, art, music, research, exhibition, entertainment, and conference centers, which are all fully equipped and available to everyone.

The central dome or “theme center” houses the cybernated system, educational facilities, health center, and facilities for shopping, communications, networking, and childcare. In addition, it serves as the core for most transportation services, which will take the form of horizontal, vertical, radial, and circular conveyors that safely move passengers anywhere within the city. This system facilitates efficient transportation for city residents, eliminating the need for automobiles. City-to-city transportation would be provided by monorail and electrically operated vehicles.

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## CYBERNATED COMPLEX

This cybernated complex utilizes advanced imaging technology to project a 3-D, “virtual” image of the earth in real time. It utilizes satellites communication systems to provide information on worldwide weather conditions, oceans currents, resource inventories, population, agricultural conditions, and fish and animal migration patterns, The interconnected, cybernated complexes represent the brain and nervous system of the entire world’s civilization. All of this information will be available on demand to everyone via the Internet. This single site manages our common heritage – the resources, carrying and health of our Earth.



## UNIVERSITY CITY



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This University of architecture and environment Studies, or "World University," is a testing ground for each phase of architectural development. This would be a "living," continually evolving research institute open to all. Student performance would be based on "competence accreditation" and research finding would be applied directly to the social structure to benefit all of humanity.

People will live in these experimental cities and provide feedback on the liveability and serviceability of the various structures. This information would be used to formulate modifications to structures so that maximum efficiency, comfort, and safety are assured. This facility is also used to develop modular systems and components that serve a wide range of needs and preferences. In most instances, the external appearance of the buildings will refer the function of the building – they are designed "from the inside out."



## MILE-HIGH SKYSCRAPERS

These skyscrapers are constructed of carbon fiber-reinforced and pre-stressed concrete. They will be stabilized against earthquakes and high winds by three massive, elongated tapered columns, which are 100 feet wide and almost a mile high. This tripod-like structure is reinforced to diminish compression, tension, and torsion stresses. These super-sized skyscrapers assure that more land will be available for parks and wilderness preserves, while concurrently helping to eliminate urban sprawl. Each one of these towers encloses a complete environment, containing a shopping center as well as childcare, educational, health, and recreational facilities. This will held alleviate the need to travel to outside facilities. Although the author is not in favour of mile-high skyscrapers, if we do not maintain a balance between the population and the earth's

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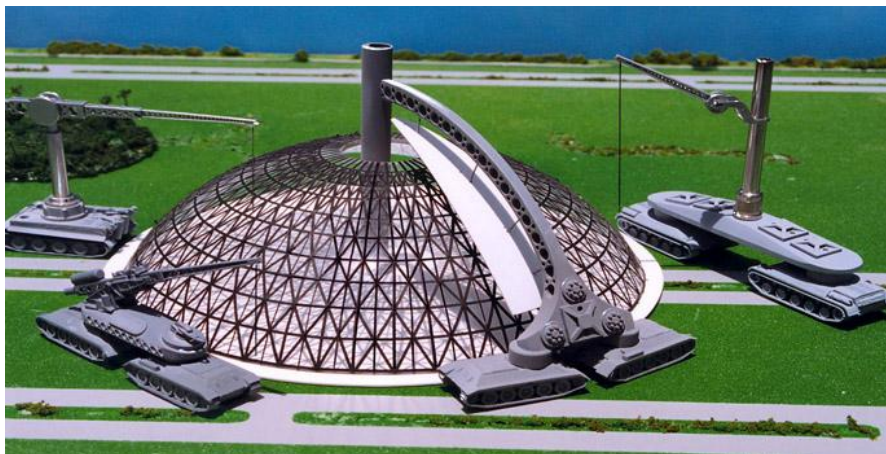
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carrying capacity we may have to move our cities not only skyward and seaward, but beneath the earth as well.



## CENTER FOR DIALOGUE

The directive of Then Center for Dialogue would be to submit the urgent issues of the times to critical examination and to raise relevant questions for informed public dialogue



## BUILDING OF DOMED STRUCTURES



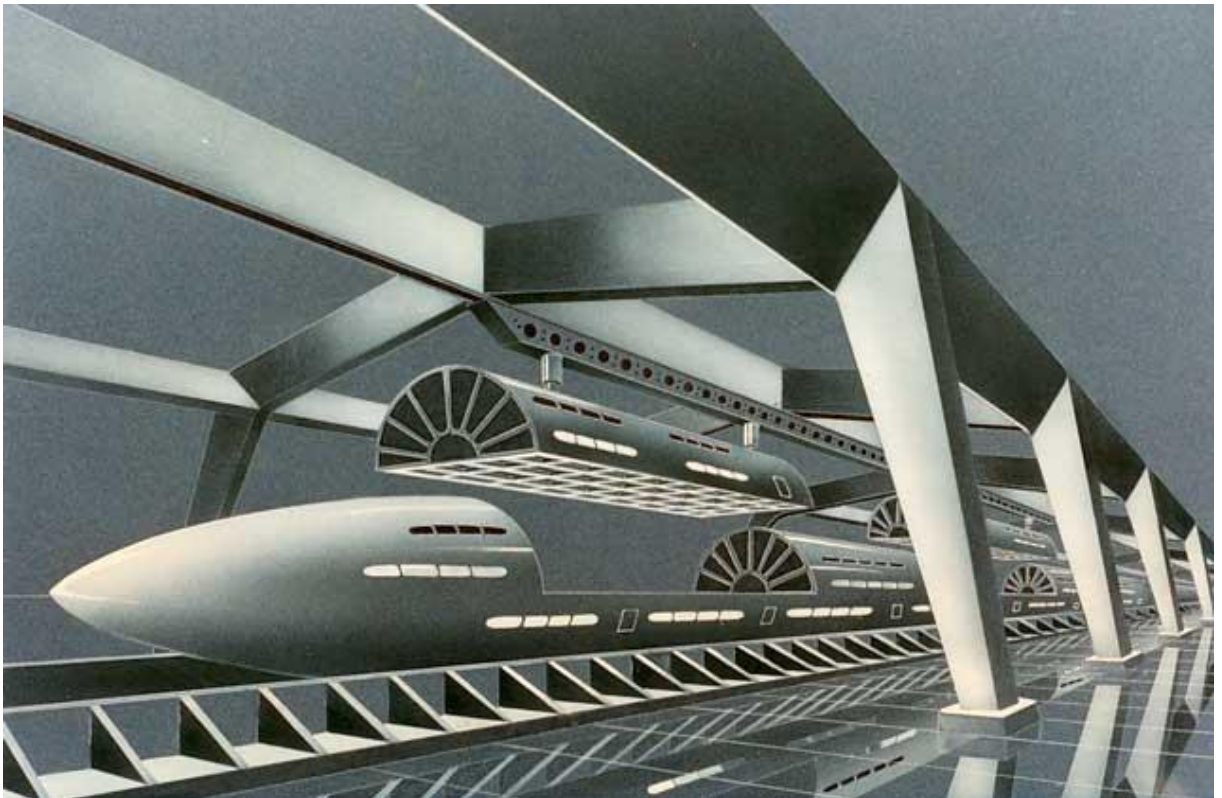


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## BRIDGES

These elegant bridges are designed to carry compression, tension and torsion loads in the simplified expression of its structural members. Mag-lev trains are suspended beneath the enclosed traffic lanes.



## MAG-LEV TRAINS – MASS TRANSPORTATION SYSTEMS

While these high-speed, magnetic levitation trains are in motion, a segment of the passenger compartment can be either lifted or slide to the side. These detachable sections can then take passengers to their local destination while other compartments

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are lowered in their place. This method allows the main body of the train to remain in motion saving time and enhancing efficiency. In addition the removable compartments could be specially equipped to serve a wide range of transportation services.



### AUTOMOBILES

Streamlined cars provide high-speed, energy efficient, and safe long range transportation. Some vehicles will have wheels, while others will eventually be equipped with magnetic levitation or air-floatation capabilities. Most vehicles will be equipped with voice-recognition technology that allows the passengers to request their destination by voice command. Self-monitoring systems tell the vehicles when service is required, and they can transport themselves to service and maintenance facilities. Use of clean, non-polluting electrical energy allows for silent vehicle operation, while proximity-sensor devices linked to automated velocity and braking systems enhance safety by enabling the vehicles to avoid collisions. As a secondary safety measure, the entire interior will be equipped with ergonomically-designed air bag systems. Within the cities, horizontal, vertical, radial, and circular conveyors will serve most transportation needs.



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## AIR TRANSPORTATION

These Vertical Takeoff and Landing (VTOL) aircraft lift passengers and freight by the use of ring-vortex air columns. The helicopter in the foreground has a stationary center around which the rotors are propelled by engines at their tips. VTOL aircraft will be propelled by a variety of techniques, from ducted fans to vectored jets. They will be designed to combine the most desirable attributes of fixed-wing aircraft, helicopters, and flying platforms. Transcontinental travel will be achieved through advanced aircraft and high-speed mag-lev trains, all integrated into a worldwide transportation system.



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## FUTURE AIRCRAFT

Since military aircraft will be unnecessary in the future, emphasis can be shifted to advancing medical, emergency, service, and transportation vehicles. Here is an example of VTOL (Vertical Take-off and Landing) aircraft with three synchronous turbines, which allow exceptional maneuverability. These delta-configuration aircraft can be controlled by electrodynamic means, eliminating the need for ailerons, elevators, rudders, spoilers, flaps or any other mechanical controls. In addition to providing better maneuverability and aerodynamic qualities, this innovative technology also includes a de-icing system. In the event of an emergency landing fuel will be ejected to prevent fires.



## AIRPORTS

The central dome of this airport of the future contains air terminals, maintenance facilities, service centers, and hotels. The runways are arranged in a radial configuration, which allows airplanes to easily take off into the prevailing winds and to avoid dangerous crosswind landings. Emergency stations at the edge of the runways are fully equipped with built-in fire fighting equipment and emergency arresting gear. All of the runways will be equipped with built-in sprinkler systems. Passengers will be transported to and from the airport by underground conveyors. Many of the terminals themselves will eventually be constructed underground for increased safety and better use of the land.

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## AUTOMATED CANALS & WATERWAYS

Included in a national transportation system would be a network of water ways, canals, and irrigation systems. We can no longer, treat natural and man-made elements of the environment as stand-alone systems. These “mega hydrological projects” will be an integrated part of intercontinental planning. These bodies of water could minimize the threat of floods and droughts while allowing the migration of fish, removal of accumulated silt, and creation of sites to manage and “clean” agricultural and urban run-off. These waterways would be part of an international flood control system that diverts floodwaters to water storage basins, allowing the water to be utilized during periods of drought. This would not only help maintain the water table, but would also provide natural firebreaks as well as an emergency water source for fires. In addition, these canals would supply water for farming and irrigation, supply land-based fish farms, protect the wetlands and wildlife, and supply water to recreation areas.



## INTERNATIONAL SHIPPING SYSTEMS

These ships will be in effect floating, automated plants, capable of processing raw materials into a finished product while en route to their destination. Some serve as industrial fish processing plants and canneries, while others would be equipped with multi-cellular compartments capable of transporting a wide variety of products. Hydrodynamic seafaring vessels permit high-speed, efficient travel. They will be energy sufficient and provide maximum comfort and safety for all passengers. They will be manufactured from durable composite materials, their outermost skin consisting of a



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thin layer of titanium, which requires maintenance. Portions of the upper deck slide open when the weather permits.



## HOMES

The architecture and individual dwellings of future cities will evolve on an entirely different basis from today's houses. With the intelligent application of humane technologies, we will be able to provide and allow for a wide array of unique individual homes. Their structural elements will be flexible and coherently arranged to best serve individual preference. These pre-fabricated, modular homes, embodying a high degree of flexibility were inconceivable in the past, but could soon be built in any place one might imagine, amide forests, atop mountains, or on remote islands.

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## HOMES

All these dwellings can be designed as self-contained, energy residences with their own thermal generators and heat concentrators. Photovoltaic arrays would be built into the skin of the building and into the widows themselves. "Thermopananes," tint out the bright sunlight by variable patterns of shading. All these features could be selected by the occupant to supply more than enough of the energy required to operate the entire household.

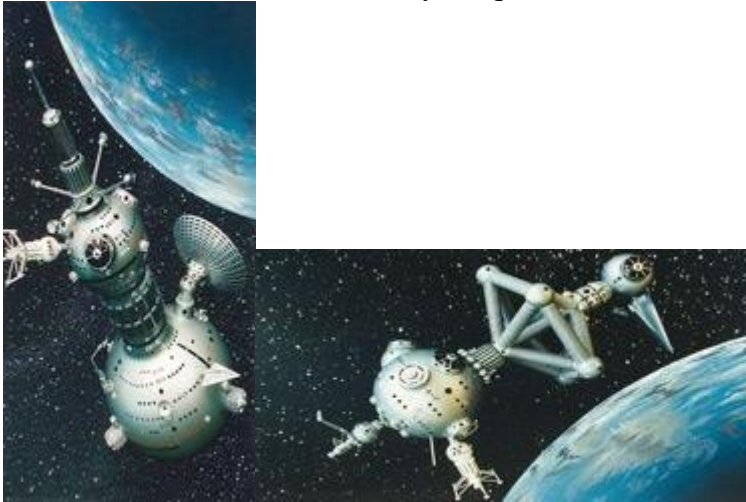


## HOMES

Homes could be prefabricated of a new type of pre-stressed, reinforced concrete with a flexible ceramic external coating; they would be relatively maintenance-free, fire-proof, and impervious to the weather. Their thin shell construction can be mass-produced in a matter of hours. With this type of construction, there would be minimal damage from earthquakes and hurricanes.

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## SPACE STATIONS

Space stations provide the advantages of a gravity-free research environment. They can be entirely automated and self-contained to permit maintenance and self-repair without human intervention. These space stations would be able to monitor the earth's resources, as well as facilitate further research in the fields of meteorology and astronomy, work that is often difficult on Earth due to atmospheric interference. Many other experiments can be accomplished in a gravity-free environment, particularly in the areas of medicine, chemistry, and metallurgy. In addition, these space stations would serve as nodes in a worldwide telecommunications systems, providing up-to-date information on the Earth's ecosystems, the position of ships and airliners, and other information pertinent to the inhabitants of the cybernated world.

# 16. LIFESTYLE IN THE FUTURE

## FAMILY MATTERS

THE MEDIA AND POLITICIANS TALK a lot about the dissolution of conventional family structure and the societal values associated with it. They see the family as the most basic institution for acquiring life skills of sociability, responsibility, stability, and concern for others. The increasing unrest and lack of direction exhibited by many young people seem to validate these concerns.

At present it is necessary for both husbands and wives to work. Monetary economics have, to a large extent, undermined family cohesion and childcare. Parents lack time to spend with their children and they are constantly stressed by ever-rising medical bills, insurance payments, educational expenses, and the cost of living. Ironically one of the most pressing expenses is childcare which to pay for, they must go to work.

In this area one of the most profound benefits of this new civilization could be realized. Shorter workdays will increase opportunities for family members to pursue areas of personal interest. Free access to goods and services will make the home a more pleasant place, and remove the economic stress that causes so much family turmoil.

Would people be happier in this kind of society? It isn't so much happiness that we seek – happiness is relative to an individual's distinct nature, and is thus individually defined and achieved. We seek to create society where people are free to choose their

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own interests, develop formerly hidden potential, and pursue their dreams without government interventions of financial constraint.

## CHANGING VALUES IN A CYBERNATED SOCIETY

As of this writing the vision of the good life in industrial nations, particularly the United States, entails productive and rewarding employment, health, a home in the suburbs and a second in the country, money in the bank, good education, pleasant family relations. Healthy and intelligent children and guarantee of a secure future. This goal is an elusive fantasy for almost all people. Tomorrow's vision of the "good life" may differ considerably. With the elimination of scarcity most material needs are met by a world resource-based economy. It is reasonable to expect considerable improvements in living conditions, and opportunities for a meaningful and productive life for all people.

Consider what the world would be like if most physical needs were met. What will happen to individuality and human values in a world of unlimited abundance?

Rather than an age of great leisure, intelligent and committed people would find very little free time, even if they didn't have to "work" for a living. The energies once devoted to problems of material scarcity could now be directed toward self-development and fulfillment. People would have the means and time for intellectual and spiritual growth, and would realize what it really means to be human in a caring society. When social affairs are consistent with the carrying capacity of Earth's resources, human beings will evolve a sense of relevance and understanding far beyond what is possible today.

All people are culture-bound. We are victims of indoctrination and our social customs. Most of us would be bewildered and uncomfortable with the flexibility of a new orientation. Today most of us live in economic and mental straitjackets that limit our ability to work through our problems. For the first time in history, the cybernated world offers us the opportunity to choose whatever constructive lifestyles we wish. Individual lifestyles would be determined by one's varied and changing preferences, and not by what someone else thinks is good for them.

An example of the wide range of choices available in a resource-based economy would be the way one selects a house. A man and woman may visit an architectural design center and sit in front of a clear hemisphere approximately six feet in diameter. The woman describes the type of house she would prefer and her areas of interest. The house appears as a 3-dimensional image in the center of the hemisphere. It rotates slowly and presents an overview of the interior and exterior. Then the man describes his major areas of interests and preferences, and maybe suggests a larger balcony. The 3-dimensional image is adjusted accordingly. When they finish requesting change, the computer presents various alternatives for them to consider. They will also be able to enter a sensorium to experience a walk-through of their preferred design and continue to make changes.

When they arrive at a final design, construction procedures are set in motion. The computer selects materials for efficiency and durability. None of the architecture is permanent, and it can be modified and updated at the request of the occupants.

This is real individual choice. In a monetary system, most of us live near our work with a house, car, and lifestyle we can afford (or, all too often, cannot afford), rather than the one we prefer. We are only as free as our purchasing power permits. Even many



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wealthy people today select a residence mainly to impress others with their status. Lacking a true sense of self worth, many live to impress others.

A resource-based economy changes the function of our dwellings from that of status symbol or basic shelter to a reflection of our individuality and interests.

A resource-based economy would provide art centers, music centers, theatre projects, and an opportunity for all to return to an educational environment, allowing them to pursue their interests. Although people would be economically secure, they would still need real challenges to maintain incentives and enhance creativity. The future will offer these challenges in abundance.

## 17. FUTURE POSSIBILITIES

NO ONE CAN FORTELL THE FUTURE of education, science, and technology with precision. There are too many variables involved, and the advent of newer developments entails an exponential rise in the learning curve. Therefore we can only extrapolate change based on current trends. Although this method had its limitations, it is the best that we have at present. The future will generate its own values.

The following projections of the future have little in common with current scenarios popularized in mainstream publications: gadgets and gimmicks available only to upscale high-income households such as high-tech kitchens with appliances that “talk” and “think”; more advanced and sophisticated weapons, warplanes, and ships; and enhanced personal security systems. All these are relevant to a scarcity-oriented culture and the need and desire for many of them disappears with the implementation of a resource-based economy.

One major development in the future will be Informatics, the science of relevant information. We are already moving from data access to management of information. The Internet and information technology allow us to create and use “stateless” information – new information we create by combining data and information from separate data systems and web sites. Development is also ongoing in knowledge management, although most efforts focus on archiving documents and processes. In a monetary allows unconstrained and simplified access to vast amounts of pertinent information.

Nanotechnology also shows enormous potential. Nanotechnology combines optics with lasers. This technology will enable us to assemble matter, atom by atom, into whatever molecular configuration is needed. Even today a variety of micro machines, some far smaller than a grain of sand, are part of our technology. This technology is capable of propelling a tiny turbine made of a silicone compound. When a laser illuminates the turbine and the beam is focused at the turbine blades, these micro machines spin rapidly and can be used for many different purposes.

Other micro machines would clear plaque from blood vessels and perform pre-programmed surgical procedures. Eventually medical nano-replicators may replace damaged or non-functioning organs. Some may even outperform the replaced organ. This includes livers, hearts, eyes, brain tissue, and more. Nanotechnology will lead to a sub-microscopic revolution not only in the field of medicine, but in industry as well.

In the industrial sector production machines would become much more versatile. Dies would be programmed to assume any required configuration by varying the molecular bond, while maintaining accuracy in the system throughout the production process. Each machine becomes faster and more versatile, performing an almost



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unlimited range of tasks. Noise abatement systems will be used throughout the industrial environment. Eventually the need to transport goods and services will also diminish. Products will be replicated and produced within one's own community, and ultimately within one's own home. With other forms of energy we would be able to explore outer space. Intelligent robots and mega machines would "terraform" (modify) uninhabitable planets above ground and underground to support human and plant life, and provide all the necessary conditions to sustain human colonization.

The replacement of paperwork by computerized technologies enable industries to save thousands of feet of space formerly used to house documents. This also eliminates thousands of clerks and secretaries. Microchip technology could free up more than seventy percent of the storage space formerly needed. At present, millions of people throughout the world have access to electronic information storage systems from their homes, work, school, libraries, etc. These information storage systems will continue to shrink, especially with the advances in nanotechnology. What may occupy thousands of square feet of storage space today, with molecular information storage systems, will fit on the head of a pin.

People could have microscopic implants that, in the event of an accident, could instantly download all the relevant medical information when they arrive at a hospital. This would eliminate emergency room paperwork and make the diagnoses much faster and easier.

Another fascinating process is advanced shape memory in plastics, metals, and other materials. This process will probably lead to sub-microscopic electro-morphic materials. Such materials will alter their external appearance to whatever shape will produce the best performance. Most home furnishings in the future will be capable of adjusting their shapes to accommodate the human body.

In the future we'll have realistic 3-D visualization with teletactile and olfactory enhancements that enable one to touch and smell flowers, and visual representations from undersea to the stars.

With the advent of artificial intelligence, the technological performance of machines will outpace, outperform, and outgrow the need for managerial oversight. Molecular circuitry will eventually provide the interface to enable human beings to engage in intelligent discourse with machines. This technology would enable machines to repeat and understand written or spoken language, including sign language or Braille, and permit instantaneous translation throughout the world. These same technologies could do research in all branches of the physical sciences; Not only will this newer technology replace humans in the production process, but in the service sectors as well.

Computer-generated technologies for multi-media applications could affect the future of entertainment resulting in 3-D, teletactile, and olfactory images that stimulate living beings and locations. The results could be so life-like that it would be almost impossible to tell simulation from reality.

With teletactile simulation in the projection of a human image, we will be able to shake hands with virtual visitors and walk with them through our gardens. These virtual visitors would be able to "pick up" objects and examine them. They would appear not as synthetic projections, but as living breathing human beings.

Today we can only imagine what teletactile imaging could mean to people who have lost loved ones, or what have lost limbs or eyesight. It also opens the possibility. This occurs on a very primitive level today through electronic media, when the president addresses the nations of the world.

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If this boggles the minds of forward-thinking people, think what it could do to our culture-bound rigid notions of reality. Regardless of personal views about the worth or value of this technology, it is coming. We already live in a world where yesterday's fantasies have been surpassed by today's realities.

Probably the only thing we can know for sure about the future is that it will be very different from the world of today. But whatever difficulties we have trying to understand life in the future, it is nothing compared to the difficulty people of the future will have understanding the way we do things today. They will likely find it hard to believe that human beings organized themselves in such an absurd fashion into nations, and then set about using scientifically-designed weapons to slaughter each other. As they watch movies of the past they will probably be astounded at tobacco smoke emanating from people's nostrils, and at ostentatious clothing and omnipresent jewellery. They find our simple animal-like emotions of hostility, rage, and jealousy incredible. People in the future will probably not look back with nostalgia on a world threatened with atomic oblivion, environmental degradation, and economic and political activities permeated by greed and self-centeredness. How simple, crude, and pathetic we will appear in the eyes of our descendants – perhaps as strange and unpleasant a sight as our own imaginings about our primitive ancestors.

When biological technology becomes further advanced, human beings as we know them will become a modified species. If we fail to include the possibility of this development in our overall social evolution, we will witness the decline of our species. All social innovation must allow for change in a constantly evolving world.

## 18. THE OCEAN FRONTIERS OF TOMORROW

THE WEB OF LIFE ON OUR PLANET is supported by the hydro-cycle, that great variation of forms of water which are part of the planetary circulation: the ocean, snow, ice, rain, lakes, groundwater, and aquifers. This constantly renewed circulation, powered by the heat of the sun, the rotation of the earth, and Coriolis forces, supports the entire life cycle, including humankind.

We often speak of underdeveloped land areas but rarely of the greatest undeveloped natural resource on the planet, which are the world's oceans. Although humans have used the oceans of the world for thousands of years as a source of foods and transportation, we are only now beginning to recognize the enormous potential and diversity of this relatively untapped resource. The oceans offer an almost limitless environment for food, energy production, minerals, pharmaceuticals, and much more.

The ocean is the only resource that has kept ahead of the population explosion. And yet we see little regard for ocean life which is essential to all life on Earth. In August 1970, the U.S. Army deliberately dumped containers holding 67 tons of nerve gas into the Atlantic Ocean. The dumping ground was close to a main artery in this life support system, the Gulf Stream. The navies of the world, the fishing fleets, cruise lines, and many coastal cities casually use the ocean as both trashcan and toilet.

If intelligently managed, the oceans could easily supply more than enough resources to feed the world's hungry. Billions depend on the sea for their primary source of protein. Life is abundant and varied here. But mismanagement of run-off has created huge lifeless areas in the Gulf of Mexico where the Mississippi River drains. Major

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marine species and the coral reefs that nurture them are rapidly disappearing, but not naturally, or because their death in any way prolongs our way of life. On the contrary, these extinctions endanger us and result from our own arrogance and ignorance. Amid the most complex living ecology, we act as predators rather than the symbiots we are.

Although most sea life dwells near the surface, in the chill murky depths miles below, where sunlight never ventures, life abounds despite fantastic pressures and temperatures. In near-freezing temperatures boiling vents of toxic gasses support a wide array of sea life we have only now begun to study.

Great rivers cross the oceans of our planet set in motion by Earth's rotation. These immense oceanic currents travel at varying speeds, at different depths, and even in opposite directions. It is estimated that the Gulf Stream carries about 30 million cubic meters of water per second past Miami, Florida. This is more than five times the combined flow of all the fresh water rivers in the world. If this potential energy were harnessed, it is estimated that the project would deliver close to a thousand million watt on a 24-hour basis, or as much as two large nuclear plants without environmental contamination or radiation danger.

Powerful winds, waves, and currents provide enormous potential for the generation of electric power. The vast potential of the seas can also be realized by the production of energy crops from biomass by converting waste organic materials into gaseous or liquid fuels.

On the sea floors, and in the brine-filled waters themselves, we find a vast storehouse of metals and minerals that may be used to help resolve resource shortages. However, "harvesting" the metals and minerals will require new technologies that do not disturb the fragile sea floor.

## CITIES IN THE SEA

Colonization of the oceans is one of the last frontiers that remain on Earth. In the redesign of our cities, prodigious oceanic-city communities may evolve. To fully utilize this bountiful well-spring of resource, the way of the future embraces the development of large marine structures designed to explore the relatively untapped riches of the world's oceans. These cities in the sea could provide improved mariculture, fresh water production, power, and a variety of mining activities, which could offer land-based mining shortages. They could provide almost unlimited riches in pharmaceuticals, chemicals, fertilizers, minerals, oil, natural gas, sweet water, and tidal and wind power, to name a few. Ocean-based and space-borne sensors will constantly track tidal flow, marine life, water composition and temperature, atmospheric conditions, and other vital signs.

The development of ocean communities will greatly relieve land-based population pressures. The population of such cities would vary from several hundred to many thousand, and would be located throughout the world. These will all be controlled, managed, and operated by automated systems, and will be part of international communications networking.

## USE

Some of these cities can serve as universities and research centers where students from all over the world study marine sciences and management. They could

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also monitor ocean currents, weather patterns, marine ecology, pollution, and geologic phenomena. For additional marine exploration, robotic submersibles would be available. The oceans are, after all, essential to our survival and critical part of Earth's carrying capacity.

Other sea platforms can be used as rocket-launching systems. Space vehicles launched at the equator save energy because the equator is the fastest moving portion of the earth. Locating launch sites there takes advantage of Earth's rotation for additional thrust. This requires fewer thrusters burns to reach geocentric orbit, or the orbit where a satellite rotates with Earth in a stationary position relative to it.

For polar orbits the launch platforms could be located off the West Coast of the U.S. The computerized control and command systems could be located on ships or on the platforms themselves.

Other areas of the ocean would remain largely untouched. These are treasures in themselves and need never be used for technological development or exploitation. Their reclamation, enhancement, and preservation should be a priority for global conservation.

The Caribbean and the emerald shoals of the vast banks of Eleuthera feature some of the clearest waters in the Bahamas, and one of the most beautiful coral atolls in the Western Hemisphere. The waters surrounding these islands vary in hue from the magnificent deep blue of the Gulf Stream to shimmering shades of green. Similar areas exist in the South Pacific and many other locations throughout the world, where thousands of miles of shoreline remain unmarred by signs of human habitation. In the new spirit of world cooperation, some of these areas could be set aside as international marine parks for the education and enjoyment of all, inviolate from exploitation. In these areas the only human intervention would be to preserve and protect these aquatic sanctuaries.

## LIFESTYLES ON THE SEA CITIES

Cities of the sea could offer new and fascinating lifestyles for millions of inhabitants while easing land-based population pressure. Massive ocean structures would be both above and beneath the sea. These structures would represent a spectacular engineering achievement with aircraft, sea craft, and submersible access.

Some of these cities in the sea could also serve as underwater international parks where visitors could observe the great protected reefs of the world. Through huge undersea windows they could view the wonders of this environment in leisure and comfort. From a computerized chair they could communicate with dolphins and other forms of marine life. The more daring among them could leave the premises by way of airlocks and go on diving expeditions.

## CONSTRUCTION

Cities in the sea could be among the greatest achievements of the twenty-first century. One of the most efficient design would be a circular multi-storied configuration, fabricated of steel, with glass of superior strength, and pre-stressed concrete reinforced with carbon fibers.

Some may be floating versions while others may be built on pilings, with flotation barriers that would prevent wind and heavy seas from damaging the structures. In

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deeper waters the floating platforms could be anchored to the seabed. Other ocean platforms could float freely. These platforms would be self-propelled and extremely stable, ballasted by columns about 20 feet in diameter that penetrate 150 feet below the surface. In the lower portions of these floating cylindrical columns are a series of disks that extend out about six feet, spaced approximately ten feet apart. These disks keep the platform steady in adverse weather conditions. A belt surrounding the project and other devices acts as a breakwater.

Some of these cities can be constructed in technically developed countries and towed to their destination in sections or as complete operating systems, similar to the manner in which oil platforms are transported to their destinations today. Other configurations can be designed as variable composite structures assembled on site, and modified to serve many different functions. They can also be disassembled and relocated if required. They would vary in size depending on their function and could be as large as three-quarters of a mile in diameter with flexible interconnections.

Other above-surface structures anchored to the seabed could serve as bases for mining operations. These dome-shaped structures would be totally automated, their flotation levels adjusted by flooding or emptying their buoyancy chambers. They may be constructed on land and towed to their destinations, where they can be submerged and anchored into place. From the tops of these structures a cylindrical concrete conduit will extend 150 feet above the ocean surface, its surface-based encircled by a floating dock system which would rise and fall with the tides, and accommodate both surface and submersible craft.

All marine development must be in full accord with the total carrying capacity and sustainment of the ocean environment. *Before initiating any of these major projects, it is imperative to take into account the possible negative impact on the entire hydrosphere – the rivers, estuaries, lakes, and oceans.*

## ENERGY

On these and other floating cities or platforms powerful wind turbines could capture the ocean breeze. Solar and wind power generators would be located on most of the upper decks. Cold water from the depths of the ocean can also be pumped up for various uses such as the conversion of this heat differential into electrical energy. This process could provide a continuous supply of electricity far in excess of the cities' needs.

## MARICULTURE

Mariculture, the planned cultivation of marine crop, and fish farming communities can be designed to support more than one type of marine life. Many of these communities could maintain a balance of species in a mutually supporting symbiotic relationship, while emulating natural conditions as closely as possible.

A wide variety of aquatic plants could also be cultivated in multiple layers, and suspended by cables in underwater fields adjacent to these cities. In some instances the tops of the plants could be harvested automatically, leaving the roots and the lower third of the plant to grow new crops without replanting.

These floating ocean platforms could also be equipped with solar-operated desalinization plants to extract fresh water for hydroponics farming and other uses. Upwelling can also be harnessed to extract deep-sea nutrients to supply aquaculture

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farming. Of course any attempt at aquaculture or mariculture must be subject to the international monitoring of ocean farms.

This would not only provide fish farming complexes, but could introduce the most advanced principles of poly-culture to maintain the reproduction and natural balance of species. Every precaution must be taken to avoid disrupting or spoiling the spawning grounds that have sustained the human race for countless centuries.

## **TRANSPORTATION**

Immense floating structures would be equipped with loading and docking facilities for vessels. Huge ships that serve as processing plants could transport passengers and freight to the cities in the sea.

The upper deck would have a landing area for helicopters or VTOL aircraft. Computerized lift-units could facilitate vertical, horizontal, and radial travel within these structures.

## **OFF SHORE APARTMENTS**

Ocean cities will help provide additional food and resources for the needs of the world. Cities in space, on land, and in the oceans can be managed by a global resource management system, thus serving every nation of the world while maximizing the well-being of everyone.

In a project of this magnitude, it is imperative that benefits be shared equality by the entire global community. Eventually mineral wealth of the oceans and the other resources of our world must be shared by all nations as the common heritage of humankind. If we fail to adopt these measures the rapid exploitation and deterioration of the ocean's resources may not be reversible.

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## OFF SHORE APARTMENTS

Offshore apartment buildings of concrete, steel, glass, titanium, and a wide variety of new synthetic materials can be built to relieve the population pressure in areas like Hong Kong. Tokyo, Los Angeles, and New York. The materials used in such projects would be engineered to withstand the corrosive effects of the harsh ocean environment.



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## ARTIFICIAL ISLANDS IN THE SEA

This artificial island in the sea is designed to serve the oceanographic sciences. Multiple docking and landing facilities for VTOL aircraft surround the entire island. Water-based recreation will be a part of life in these water-borne communities. People will be able to participate in research, sailing, scuba diving, and many other surface and sub-surface activities without disturbing the balance of the marine environment



## MARICULTURE & SEA FARMING

This is a conceptual view of a mariculture and sea-farming system. Such systems cultivate and raise fish and other forms of marine life to help meet the nutritional needs of the world's people. Capable of cultivating a great variety of marine life, these structures would be equipped to permit the free flow of water throughout. They are designed to be a non-contaminating, integral part of the marine environment.



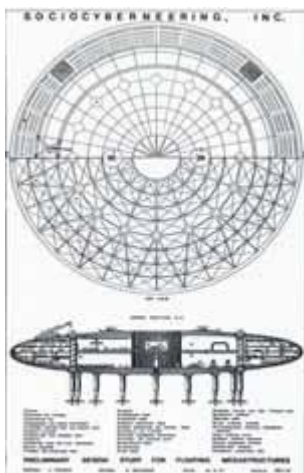
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## OCEAN MINING MEGA-STRUCTURES

These “cities in the sea” provide improved mariculture, fresh water production, power, and deep-ocean mining, which can help alleviate shortages of land-based minerals. Such structures could provide us with almost unlimited resources: pharmaceuticals, chemicals, fertilizers, minerals, metals, oil, natural gas, drinking water, ocean farming, as well as tidal and wind power.



(Image too small but good one)

## SOCIOCYBERNEERING

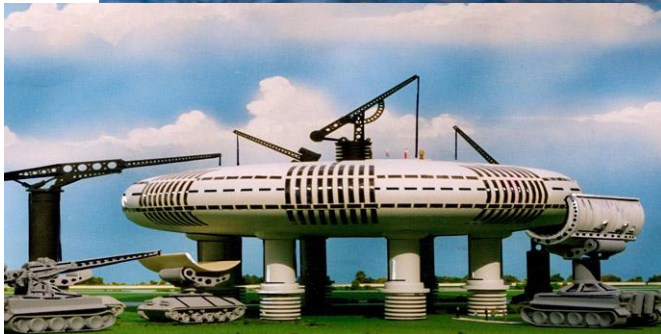
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## CITIES IN THE SEA

Thousands of self-sufficient cities in the sea, varying in design according to their location and function, will eventually alleviate land-based population pressures. Some will serve as oceanographic universities to survey and maintain a dynamic balance in the oceanographic environment.



## CONSTRUCTION OF A FLOATING MEGA-STRUCTURE

This illustration depicts a "floating mega-structures" that is being assembled in a dry dock entirely by robotized, automated systems free of any human intervention. After construction, these structures could be towed in sections or as completed units to

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locations where they would be anchored to the seabed. In some instances these cities could even travel and relocate.



### CITY IN THE SEA WITH A MODULAR FREIGHTER

This modular freighter, leaving a city in the sea, consists of detachable sections that can be rapidly loaded or unloaded. The number of section varies, depending on the amount of freight to be delivered. When all the modules are connected they can be propelled as a single unit. When the freight arrives at its destination, the selected modules can be disconnected and towed to docks.



### FLOATING SEA DOMES

These unsinkable, floating sea domes will house those who prefer unique offshore or island living. In the event of inclement weather, they could easily be towed ashore, mounted and locked to elevated support structures. They are all equipped with retractable enclosures that cover the outer dock.



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UNDERSEA OBSERVATORIES

Elevators transport visitors to underwater oceanographic viewing or research facilities. An extended under-water tunnel connects to other aquatic facilities and provides expansive, panoramic views of the undersea world in its natural habitat without disturbing the ocean environment.

## 19. BEYOND UTOPIA

IN 1898, EDWARD BELLAMY wrote the book *Looking Backwards*. It presented a social system with many advanced ideas for its time. This best seller generated a great deal of interest and many people wrote to ask how the type of cooperative society Bellamy envisioned could be brought about. But our nation at that time was not prepared for a transition of this magnitude.

The proposals he presented, and those of Plato's *Republic*, the writings of Karl Marx, H.G. Wells in *The Shape of Things to Come*, and many others, all represent attempts to find workable solutions to the problems that earlier civilizations have left unresolved. There is little doubt that at the time of Bellamy's book social conditions were abominable, which made the Utopian ideal much more appealing. What appears to be lacking in most of these concepts, however, is any plan or process to facilitate the transition. Most of the early visions of Utopia did not allow for changes in either technology or human values, tending to arrest any innovative efforts. And all lacked a set of blueprints and methodology for implementing the ideas in a comprehensive form, and a competent staff to effect the transition.

Now, at last, we have such a vision and the means to make it a reality. In recent times we have evolved the necessary technology to surpass the fondest hopes and dreams of any social innovations of the past. Although many of the concepts presented in this book may appear to people of the early twenty-first century to be unattainable goals, all of these concepts are based upon known scientific principles. The only limitations on the future of humankind are those we impose upon ourselves.

The social direction we speak of has no parallel in history with previous political ideology or economic strategy. Just because previous attempts failed, however, is not a reason to stop trying. The real danger lies in doing nothing.

Determining the parameters of this new civilization will require a break with many of the traditions of the past. The future will evolve its own new paradigms to fit each successive phase of human development.

Major influences on the earliest Utopian concepts were some of the world's religious teachings. In these imagined visions of heaven there were no property lines, banks money, police, prisons, militarism, or private ownership.

Not so many years ago an attempt was made in the U.S. to understand a social system very different from our own. A film our called "The March of Time" had this to say about Soviet Communism: "We believe that the American free-enterprise will function better than the collective system. However, we wish you the best of luck on your new and unusual social experiment." The failure of communism to provide for human needs and to enrich the lives of its citizens is not unlike our own failures. In all established social systems it is necessary to devise different approaches to improve the working of the system.

Thousands of failures occurred before the first workable airplane was produced. Dr. Erlich attempted over 606 different approaches to controlling syphilis before one finally



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proved successful. Some of the technology we use today, such as televisions, radios, aircraft, and automobiles, are in a constant state of improvement and modification. Yet our social system remains largely static.

An inscription on one of our government buildings reads: "Where there is no vision the people perish." The major reason for resisting change is that it threaten vested interests. The fear of social change is unfounded because the history of civilization is one continuous experiment. The American free-enterprise system, during its earliest stages, faced problems even more severe than they are today – long hours, exploitation of child labor, inadequate ventilation in industrial plants, lack of rights for women and black Americans, hazardous conditions in mines, and racial prejudice. Despite many problems, it was the greatest historical innovation in lifestyle, architecture, technology, and the general pursuit of progress. All we recommend is that we continue our process of social experimentation and transcend the limitations of our current society to enhance the lives of everyone.

Our future does not depend on present-day beliefs or social customs, but will continue to evolve a set of values unique to its own time. There are no Utopia. The very notion of "Utopia" is static. The survival of any social system ultimately depends on its ability to allow for change to improve society as a whole.

## 20. THE VENUS PROJECT DIRECTION

THE VENUS PROJECT IS AN ORGANIZATION based on the ideas, designs, and directions presented in this book, representing the life's work of its originator and Project Director, Jacque Fresco. Its 25-acre research and design center is located in Venus, Florida, where the future is taking shape now. The Venus Project's purpose is to design, develop and prepare plans to build the first experimental city. Here we are developing alternative energy systems, city designs, transportation, manufacturing methods, and more. Along with this research we are creating blueprints, renderings, and models, while holding seminars and producing books, videos, and other material to introduce people to the aims of the Venus Project and our vision for the future.

Without reservation, we conclude that the Venus Project cannot be accomplished within a money-based society. It would take too many years for any significant changes. Any attempt to adapt our goals to a money-based system would water them down to such an extent that the changes would be insignificant.

As emphasized earlier in the book it is no longer the repetitious work of labourers that automation will continue to phase out, but also that of engineers, technicians, scientists, doctors, architects, artists, and actors as well. All of these professions will be a short-lived means of providing purchasing power. It is simply a matter of time before automated systems provide nearly all necessary services and products. Virtually all tasks presently performed by human intelligence could be performed by automated systems. This need not be a cause for alarm. In a cybernated resource-based culture, human work will consist of creative endeavour and problem solving. There appears to be no limit to the services and benefits for human beings that can be performed by computerized technologies and AI.

The Venus Project call for a straightforward redesign of the culture in which war, poverty, hunger, debt, environmental degradation, and unnecessary human suffering are viewed not only as avoidable, but totally unacceptable.

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If we are sincere and genuinely concerned with resolving our problems, we must strive towards having the Earth's resources declared as the common heritage of all the world's people. For the reasons discussed in this book, anything less will simply result in a continuation of the problems inherent in our present system.

To transition from our present politically incompetent, scarcity-oriented, and near-obsolete culture to a more humane society will require a quantum leap in both thought and action. Until recently change came slowly. One group of incompetent leaders simply replaces another. The problem we face today cannot be solved politically or financially. Our problems are highly technical in nature and require fundamental changes in our thinking and values. There is not enough money available to pay for the required changes in our thinking and values. There is not enough money available to pay for the required changes, but there are more than enough resources. This is why The Venus Project advocates the transition from a monetary society to the eventual realization of a resource-based economy.

The money-based system evolved centuries ago. All the worlds' economic systems – socialism, communism, fascism, and even our free enterprise systems – perpetuate social stratification, elitism, nationalism, oppression, and racism, based primarily on economic disparity. Power relates to an individual's or group's ability to withhold food, shelter, health care, education, and resources from the poor and disadvantaged. The basic sustaining factors of life are held hostage for hours of labor as represented by a salary. As long as a social system uses money or barter, people and nations will seek to maintain the economic competitive edge; if they cannot do so by means of commerce they will attempt to do so by means of boycotts, blockades, or military interventions are in progress around the world.

All social systems, regardless of political philosophy, religious beliefs, or social customs, ultimately depend upon natural resources, clean air and water, arable land, and the necessary technology and personnel to secure and maintain a high standard of living.

The Venus Project concludes that the Earth is abundant with plentiful resources. Our practice of rationing resources through monetary control is irrelevant and counter-productive to our survival.

Modern society has access to highly-advanced technologies that can provide sufficient food, clothing, housing, medical care, education, and the development of a limitless supply of renewable non-contaminating energy. We have the technology, resources, and personnel for everyone to enjoy a very high standard of living with all of the amenities a prosperous global civilization can provide. This can be accomplished through the humane and intelligent application of science and technology based upon the existing carrying capacity of Earth.

The Venus Project asserts that the necessary technology already exists to begin making maximum resources available and to provide food, clean air and water, comfortable housing and transportation, quality health care, environmental stability, and unlimited opportunities for personal growth to all people, not just a select few.

Our understanding of technology suggests the possibility of eliminating scarcity by apply renewable source of energy. Humane and intelligent resource management along with cybernation will help maintain a balanced-load economy and a far more equitable distribution of the world's resources.

Machines will monitor production and delivery of goods and services, and protect the global environment. They will not monitor people. In a resource-based economy monitoring people is not only socially offensive, but also counterproductive.

# THE BEST THAT MONEY CAN'T BUY BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

In a saner and more humane civilization competent use of machines would shorten the workday, increase the availability of goods and services, and lengthen vacation time. If we utilize new technology to raise the standard of living for all people, machine technology will no longer be perceived as a threat. We would replace most forms of human labor with challenging interesting pursuits in problem solving and creative effort, while encouraging individuality and new incentives. The purpose of organized technology is to free people from the monotonous and boring work-a-day world, and to enable them to pursue a more meaningful life.

Today financial barriers place enormous limitations on innovation, development, individual creativity, and incentive. In the world envisioned by The Venus Project people are free of the constraints of profit and control, and are able to explore new dimensions in human existence and pursue knowledge in the arts, sciences, and other areas of their choice. There is tremendous undeveloped potential in all human beings which is not nurtured in a monetary society. All would benefit by the fruition of new ideas. In a resource-based society, the measure of success would be the fulfilment of individual preferences and pursuits rather than the acquisition of wealth, prosperity, and power.

## HOW WE GET FROM HERE TO THERE

*The Venus Project* is The Venus Project is in the process of introducing a set of values and procedures that may enable us to achieve social nucleation. Our project will provide the designs and blueprints for a prototype community to test the validity of our proposals: we will strive for a relevant orientation by which people may adapt intellectually and emotionally to our new technological age. We feel that anything short of overall social design would be inappropriate and infective.

Since we begin in a money-based society, raising funds to construct the experimental community can be accomplished in several ways.

One is through the production of a major motion picture depicting the advantages of this new social system for the world's people. Another is the building of a theme park where visitors would actually experience some of the benefits of The Venus Project's proposals. Books, videos, blueprints, models, a movie script, and the 22-acre research and development center have already been completed.

Any funds raised by these proposed projects, along with contributions, publications, videos, seminars, lectures, and grants, will be used to help initiate and construct the first experimental city.

Our proposals are submitted to the general public and to all educational institutions. We invite your participation. If enough people find the proposals acceptable and join with us in this new advocacy, we could form the nucleus of an organization to more forcefully implement the aims of The Venus Project.

## EXPERIMENTAL CITY

*The Venus Project* proposes the building of a new experimental city, the purpose of which is:

- 1) To be a laboratory to test the validity of the project's designs and proposals.
- 2) To establish a permanent center that could be used for future long and short-term planning.

## THE BEST THAT MONEY CAN'T BUY BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

The circular configuration of the cities proposed by The Venus Project are not just stylized architectural conceptualization, but the results of years of research into an environment that best serves the needs of the occupants efficiently and economically. Without sufficient knowledge of the symbiotic interrelationship between humanity and the environment, it would be extremely difficult to develop workable solutions to our many problems. The Venus Project has taken this and many other factors into careful consideration and study.

This new experimental city would be devoted to working toward the aims and goal of The Venus Project, which are:

1. Realizing the declaration of the world's resources as being a common heritage of all people.
2. Transcending the artificial boundaries that currently and arbitrarily separate people.
3. Replacing the money-based nationalistic economies with a resource-based world economy.
4. Assisting in stabilizing the world's population through education and voluntary birth control.
5. Reclaiming and restoring the natural environment to the best of our ability.
6. Redesigning cities, transportation systems, and agricultural industries and industrial plants so that they are energy efficient, clean, and able to conveniently serve the needs of all people.
7. Gradually outgrowing corporate entities and governments, (local, national, or supranational) as means of social management.
8. Sharing and applying new technologies for the benefit of all nations.
9. Developing and using clean renewable energy sources.
10. Manufacturing the highest quality products for the benefit of the world's people.
11. Requiring environmental impact studies prior to construction of any mega projects.
12. Encouraging the widest range of creativity and incentive toward constructive endeavour.
13. Outgrowing nationalism, bigotry, and prejudice through education.
14. Eliminating elitism, technical or otherwise.
15. Arriving at methodologies by careful research rather than random opinions.
16. Enhancing communication so that our language is relevant to the physical conditions of the world.
17. Providing not only the necessities of life, but also challenges that stimulate the mind, while emphasizing individuality rather than uniformity.
18. Finally, preparing people intellectually and emotionally for the changes and challenges that lie ahead.

Like all innovative social proposals, ours starts with a few devoted people who dedicate their time to informing others of the humane benefits of this new direction and to the variety of tasks pertinent to the project. All are invited to participate, in whatever capacity they can, to help carry out the initial design phases of this new experimental city. During the initial phase, we will utilize an interdisciplinary team of systems analysts, engineers, computer programmers, architects, city planners, sociologists, psychologists, educators, etc.



THE BEST THAT MONEY CAN'T BUY  
BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

The Venus Project does not regard environmental condition as fixed or static. We must allow for adaptation and changes as a continuous process. This avoids the tendency to perpetuate temporary arrangements beyond their period of usefulness.

A circular city would be a transitional phase and could evolve from a semi-cooperative money-oriented society to a resource-based economy. This could be the prototype for a series of cities to be constructed in various places throughout the world. The rate of progress will depend on the availability of funds raised during the early stages and the people who identify with, participate in, and support the aims and direction of The Venus Project.

As these new communities develop and become more widely accepted, they may very well form the basis of a new civilization, preferably through the process of evolution rather than revolution.

We are well aware that no one can actually foretell the shape of the future. We can only extrapolate from present information and trends. Population growth, technological change, worldwide environmental conditions, available resources are the primary criteria for future projections.

We are also aware that there is no single philosophy or point of view whether religious, political, scientific, or ideological, that someone would not be able to take issue with. We feel certain, however, that the only aspects of The Venus Project that may appear threatening are those which others project onto it.

The Venus Project is neither Utopian nor Orwellian, nor does it reflect the dreams of impractical idealists. Instead, it presents attainable goals requiring only the intelligent application of what we already know. The only limitations are those which we impose on ourselves.

The Venus Project does not advocate any type of sabotage of the existing free-enterprise system. We believe that it will come to an end of its own accord as indicated in this book. We do, however, wish to provide an alternative approach for your consideration. We encourage you to become better informed about the proposals of this project through our books, videos, and seminars. If you identify with this direction we welcome you to join with us and work towards its realization.

A view from space presents us with an ever-changing image of this beautiful planet and an impression that our world is one. The artificial national borderlines do not appear. We are finally beginning to realize that humankind is one single family. Only when the nations of the world agree upon a common direction and can state problems precisely will we be able to reach workable solutions. In times to come loyalties and beliefs that divide, mislead, and destroy social continuity should vanish, and we may realize that most of the major problems confronting the nations of the world are human in origin. We must act, and act swiftly, to avoid further degradation of both our planet and ourselves. We must act while Earth and humankind still retain their intrinsic worth.

TO CLOSE, WE INVITE YOUR COMMENTS AND PARTICIPATION

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# THE BEST THAT MONEY CAN'T BUY BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

## VIDEOS

### WELCOME TO THE FUTURE

This video is an overview explanation of the direction and the aims of The Venus Project. It presents an attainable vision of what our world could be if we intelligently apply science and technology with environmental and human concern – a future where war, poverty and hunger could be but a distant memory. It advocates surpassing the monetary system by introducing a resource-based economy, in which all of the world's resources are utilized for the common heritage of all people. It presents a vision of future cities (on land and sea), new architecture, silent and efficient transportation, clean energy alternatives, The Venus Project's 22-acre design and research center and much more. Included are interviews with project founder and director Jacque Fresco, his assistant Roxanne Meadows and others.

*Running Time approximately 53 minutes*

### CITIES IN THE SEA

This video takes you on a journey of tomorrow's cities in the sea. It presents Jacque Fresco's fantastic and imaginative designs and footage of numerous massive ocean structures that will monitor and protect the ocean environment while providing recreation, education and an enriching lifestyle for the occupants. This can be accomplished with the utmost concern for the marine

*Running time approximately 15 minutes*

### SELF-ERECTING STRUCTURES

This video presents Jacque Fresco's exciting and imaginative animated concepts of self-erecting structures within a global cybernated future. You will see how these automated machines will construct our cities on land and in the sea, dig canals, build bridges, operate factories and farms, transport passengers and freight and eventually be assigned the task of environmental and resource management.

*Running time approximately 15 minutes*

### A CONVERSATION WITH JACQUE FRESCO

Interview with Jacque Fresco, founder of The Venus Project

*Approximately 24 minutes*

### ZEITGEIST ADDENDUM

This riveting film by Peer Joseph features The Venus Projects with interviews of Jacque Fresco and Roxanne Meadows. It deals with the failure of our world to resolve the issue of war, poverty, and corruption, rests within a gross ignorance about what guides human behavior to begin with. Zeitgeist-Addendum' addresses the true source of the instability in our society, while offering the only fundamental, long term solution

*Running time approximately 120 minutes*

### FUTURE BY DESIGN

A film on Jacque Fresco, Founder of The Venus Project, by William Gazecki. This 2-disc collector's edition includes:

- Feature-length Future by Design documentary
- Director's Commentary
- Additional Scenes

## THE BEST THAT MONEY CAN'T BUY BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

- Extensive Photo Gallery of Jacque Fresco's drawings and models
- Exclusive Interview with special effects CG Animator, Doug Drexler
- Exclusive Interview with Composer Diane Louie
- Classic Larry King interview with Jacque Fresco, Miami, 1974 (40 minutes)
- Extensive educational Materials developed by Jacque Fresco and Roxanne Meadows

### BOOKS

#### THE BEST THAT MONEY CAN'T BUY: BEYOND POLITICS, POVERTY, & WAR

Published in 2002, 170 pages, softcover. Hundreds of books address technological change, business process management, human productivity, and environmental issues. Almost all overlook the major element in all these systems – human beings and their social structures and culture. This book offers a possible alternative and methods to consciously fuse all these elements to create a sustainable future for all our planetary inhabitants, as well as fundamental changes in the way we regard ourselves, one another and our world. 70 color photos of Fresco's original designs representing this possible future are also presented.

### DESIGNING THE FUTURE

Jacque Fresco concisely dissects the causes of social dilemmas, and gives workable alternatives to militarism, poverty, hunger, politics and commercialism. "It is not ethical people we need in government, but the intelligent management of Earth's resources." This book explains and illustrates a future where goods and services are available to all surpassing the need for war and politics. It includes pictures of Fresco's original designs depicting this sustainable social direction.

E-Book Download is in Adobe pdf format.

### LECTURES AND SEMINARS

Jacque Fresco is available for lectures and seminars.

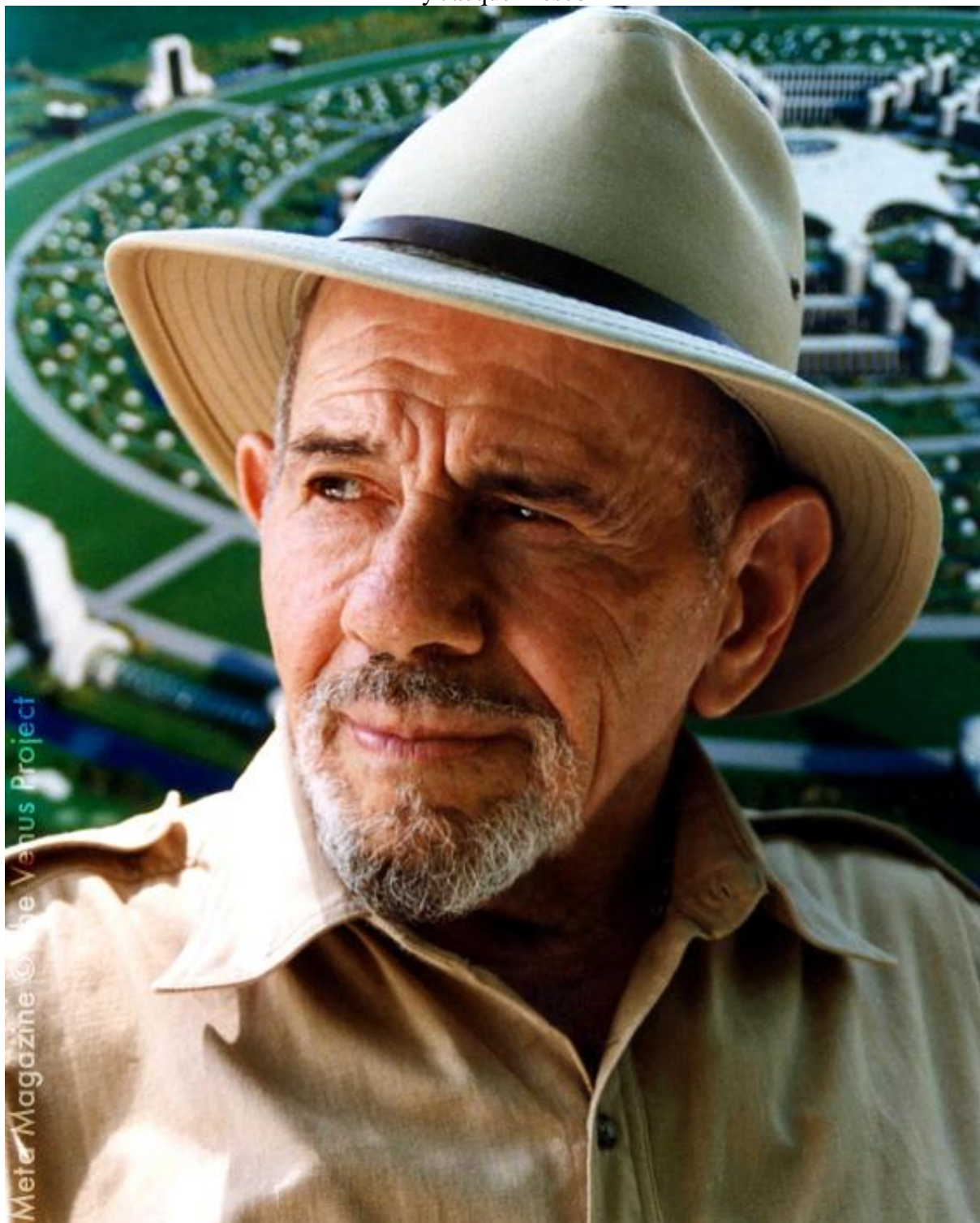
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THE BEST THAT MONEY CAN'T BUY  
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Image

JACQUE FRESCO

Futurist Jacque Fresco is a forerunner in the field of Industrial Design and Human Factors Engineering. Over the years, he has conceived a vast array of creative and innovative designs and plans for such things as prefabricated houses, automobiles, electronic and medical equipment, and hundreds of commercial products and inventions. Included among his many inventions are a radical aircraft wing structure and technique for viewing three-dimensional motion pictures without the need for special viewing glasses. In addition, he has served as technical advisor for a number of motion pictures. His works and ideas have been presented on numerous television and radio talk shows throughout the world, and articles about him have been featured in many national and international magazines and newspapers. Not only does he write and lecture about the future, but he actually lives in a future-oriented environment with his associated Roxanne Meadows. Together they have constructed a 22-acre research and development center in Venus, Florida where the future is unfolding. The Venus Project reflects the culmination of his life's work: the integration of the best of science and technology into a comprehensive plan for a new society based on human and environmental concern. It is a global vision of hope for the future of humankind in a technological age.

# THE BEST THAT MONEY CAN'T BUY BEYOND POLITICS, POVERTY, & WAR

By Jacque Fresco

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