Paths to Planetary Civilization

By Ervin Laszlo

1. UNSUSTAINABILITY AND THE NATURE OF CHANGE

We have arrived at a watershed in history. The world we have created is no longer sustainable: it will either change, or break down. The question is no longer whether change will happen, only when it will happen and at what price.

Given current trends in demography, resource consumption, militarization, life-style and wealth-disparities, and the degeneration of the environment, our future is no longer assured. While on the one hand we could pave the way toward a system of social, economic, and political organization that is peaceful and capable of ensuring an adequate level of sustainability of the human life-supporting environment, on the other we could find ourselves on a descending path toward spreading terrorism, crime, and war, with growing cultural clashes, political conflicts, ecological degeneration, and more and more natural and man-made catastrophes. The choice at this point in time is still open. It merits deeper reflection.

The unsustainability of the world means that change must happen, and that it cannot be piecemeal and superficial. The future can no longer be a simple continuation of the past; it will have to be fundamentally different. Many people have difficulty comprehending this basic fact. They still believe that, as the French saying goes, *plus ça change, plus c'est la même chose* (the more things change, the more they are the same). After all, we are dealing with humans and human nature, and these will be pretty much the same tomorrow as they are today.

A more sophisticated variant of the currently dominant view perceives the possibility of change, but does not see it as fundamental. It describes the future in terms of the unfolding of "trends." Trends, whether local or global, micro or mega, introduce a measure of difference: as they unfold, there are more of some things and less of others. The world is still the same, only some people are better off and others worse.

This view is also shared by forecasters, and by trend analysts. An example is the series of much-publicized reports of the U.S. National Intelligence Council. One such report, titled *Global Trends 2015: A Dialogue about the Future with Nongovernmental Experts* was published in 2000. According to this non-classified report, the state of the world in the year 2015 will be determined by the unfolding of key trends, catalyzed by key drivers. The seven key trends and drivers are demographics, natural resources and environment, science and technology, the global economy and globalization, national and international governance, future conflict, and the role of the United States. The way these trends unfold under the impact of their drivers can produce four different futures: a future of inclusive globalization, another future of pernicious globalization, a future of regional competition, or a post-polar world. The main deciders are the effects of globalization—

they can be positive or negative—and the level and management of the world's potential for interstate and interregional conflict.

When all these factors are taken into account, we get what the experts call "the optimistic scenario." In this perspective the world of 2015 is much like today's world except that some population segments (alas, a shrinking minority) are better off and other segments (a growing majority) are less well off. The global economy continues to grow, although its path is rocky and marked by sustained financial volatility and a widening economic divide.

Economic growth may be undone, however, by events such as a sustained financial crisis or a prolonged disruption of energy supplies. Other "discontinuities" may occur as well:

- violent political upheavals due to a serious deterioration of living standards in the Middle East (this has now happened, with dramatic consequences);

- the formation of an international terrorist coalition with anti-Western aims and access to high-tech weaponry (now a real and growing threat);

- rapidly changing weather-patters that inflict grave damage on human health and on economies (this is now more imminent than ever);

- a global epidemic on the scale of HIV/AIDS;

- the antiglobalization movement growing until it becomes a threat to Western governmental and corporate interests;

- the emergence of a geo-strategic alliance—possibly by Russia, China, and India—aimed at counterbalancing the United States and Western influence;

- collapse of the alliance between the United States and Europe;

- creation of a counterforce organization that could undermine the power of the International Monetary Fund and the World Trade Organization and thus the ability of the United States to exercise global economic leadership.

In the year 2000, when this report of the National Intelligence Council was published, it was anybody’s guess whether the world of 2015 will be the same kind of world as the world we live in today—or something quite different. Today, in 2005, this is no longer an open question. The world in 2015 will be very different from what it is today—not to mention what it was at the beginning of this century.

However, the NIC still produces linear extrapolations of the future. According to the report published in early 2005, titled *Mapping the Global Future* (based on consultations with 1,000 futurists around the globe) the world in 2020 will not be very different from today. Terrorism will still be present, although the prospects for wars by major powers

will recede. It is a “relative certainty” that the U.S. will remain the most powerful nation, economically, technologically, and militarily, although a possible—but manageable—erosion of U.S. power must be reckoned with.

Such reports highlight the limits of trend-based forecasting. They ignore that trends not only unfold in time, but can also break down and give rise to new trends, new processes, and different conditions. This possibility needs to be considered, since no trend operates in an infinitely adapted environment; its present sway and future unfolding have limits. These may be natural limits due to finite resources and supplies, or human and social limits due to changing structures, values, and expectations. When a major trend encounters such limits, the world is changing and a new dynamic enters into play. Extrapolating existing trends does not help in defining the emerging world.

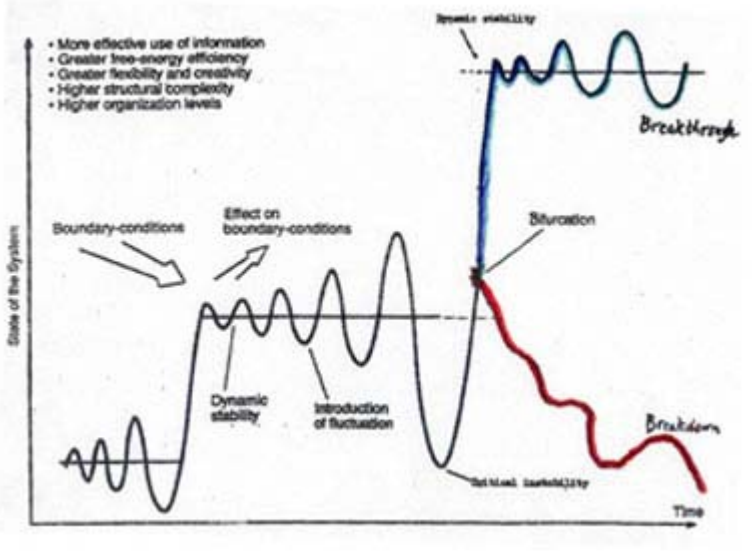
2. THE DYNAMICS OF SYSTEM-TRANSFORMATION

To know what happens when a trend breaks down calls for going beyond the observation of current trends and following their historic path. It calls for knowing the developmental dynamics of the system in which the observed trends appear — and may disappear. Such knowledge is provided by the theory of complex systems, especially its branch popularly known as "chaos theory." Because of the unsustainability of many processes in today's world, the dynamic of development that will apply to our future is not the linear dynamic of classical extrapolation but the nonlinear chaos dynamic of complex-system evolution. The crisis we are currently experiencing will not be overcome by tried and tested measures, carried out step by step. The way beyond today’s crisis lies in profound and radical transformation.

We can no longer ignore that current trends build toward critical thresholds — toward some of the famous (or infamous) "planetary limits" that in the 1970s and 1980s were said to be the limits to growth. Whether they are limits to growth altogether is questionable, but they are clearly limits to the *kind* of growth that is occurring today. As we move toward these limits, we are approaching — and have now definitively entered — a period of instability. It brings with it the deflection or disappearance of some trends and the appearance of others. This is not unusual: systems and chaos theory tell us that the evolution of complex systems always involves alternating periods of stability and instability, continuity and discontinuity, order and chaos. We are living in the opening phases of a period of social and ecological instability — at the bifurcation point.

A bifurcation is the critical decision-point of a vaster and more general process: the process of complex-system evolution. Whether it occurs in nature or in the human world, evolution is characterized by basic features that recur independently of the nature of the things that evolve, and also of their particular their time and place. Wherever it occurs, the process is continuous and unrelenting, but it is not smooth and even. Aside from occasional temporary reversals, the evolution of complex systems is largely *irreversible*, and the way it unfolds is highly *nonlinear*. A seemingly enduring process of change suddenly forks off in a new direction. This process comes to the fore whenever and wherever the systems undergo irreversible change.

The critical forking — the "bifurcation" of the evolutionary trajectory — comes when fluctuations that were previously corrected by self-stabilizing negative feedbacks within the system run out of control: they break open the system's structure. Then the system enters a period of chaos. Its outcome is either the disintegration of the system to its individually stable components {*breakdown*), or rapid evolution toward a kind of system that is resistant to the fluctuations that destabilized the prior system (*breakthrough*). In a breakthrough the transformed system has enhanced information-processing capacity, greater efficiency in the use of free energy as well as greater flexibility, higher structural complexity, and additional levels of organization.



The evolutionary process of alternating dynamic stability and critical instability leads to the progressive build-up of complexity in nature, from the physical substratum of quarks and elementary particles, through the atoms of the elements, the molecules formed by some of the atoms and, in suitable planetary environment, to the macromolecules and cells formed by some of the molecules. On Earth it has further led to protozoa and metazoa based on macromolecular and cellular components, to the ecosystems formed by these sequentially integrating natural systems, and to the sociocultural and technological systems formed by human groups.

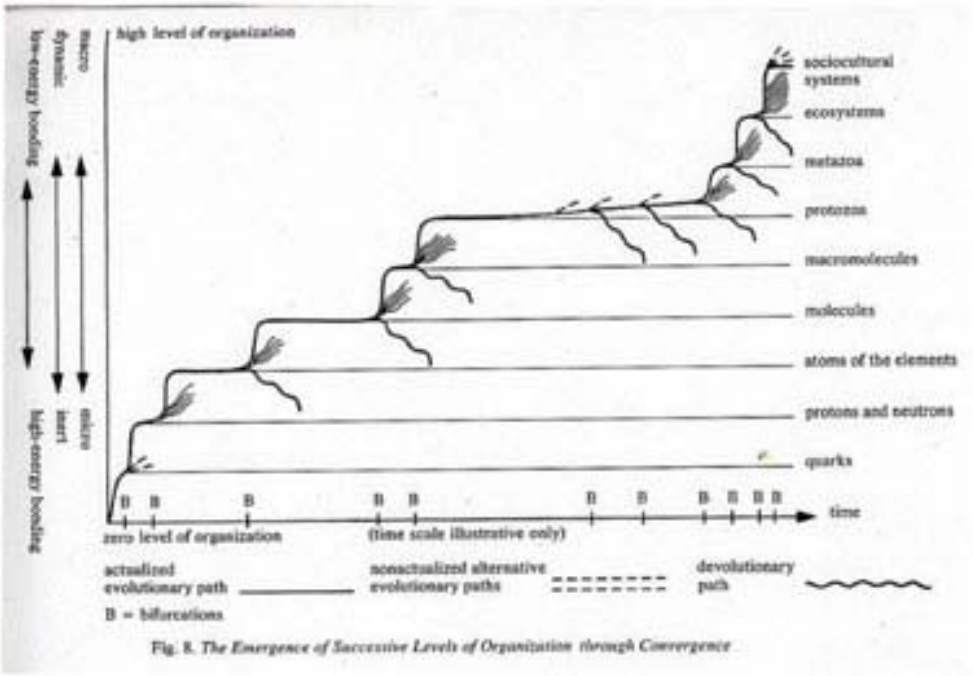
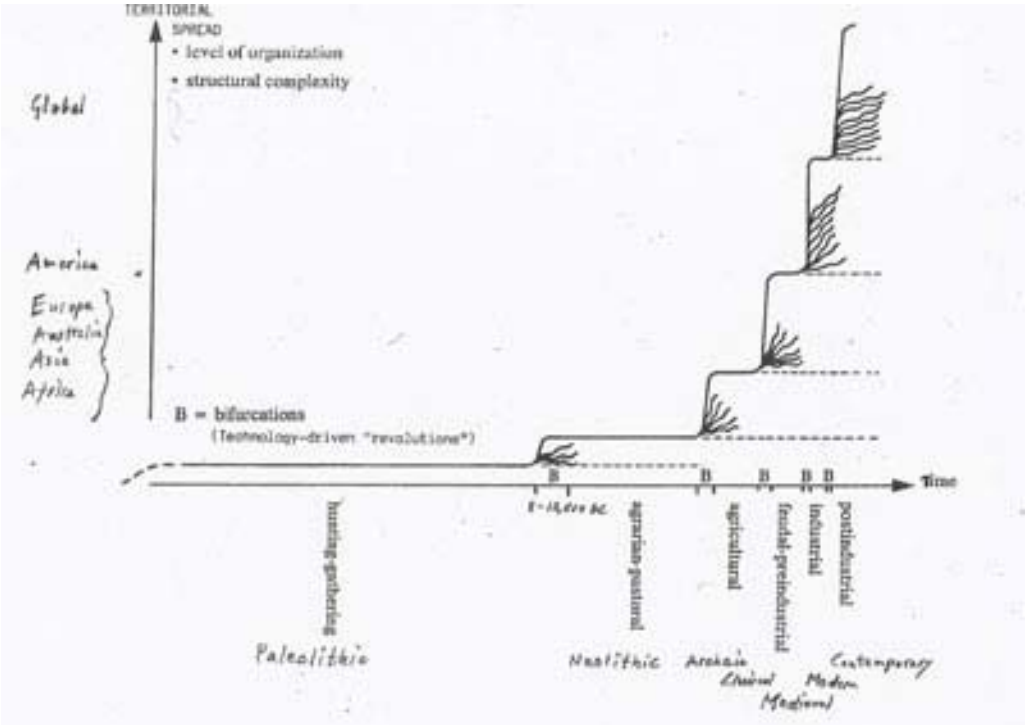
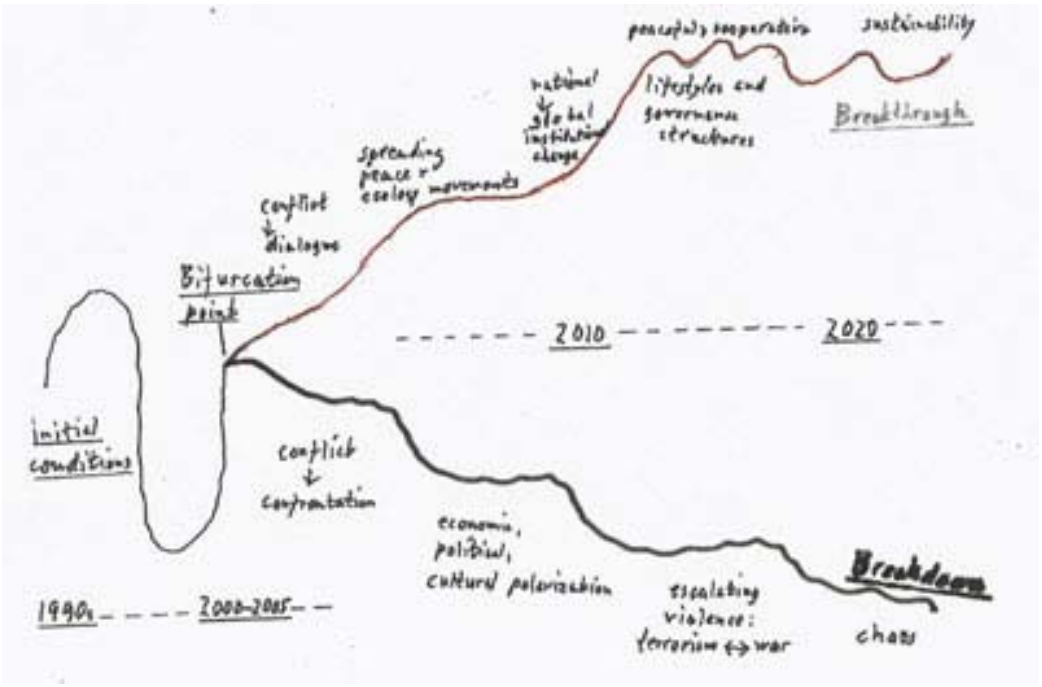


Fig. 8. *The Emergence of Successive Levels of Organization through Convergence*

Bifurcations in society are all-encompassing: they involve every segment and every aspect, politics and business, as well as culture, lifestyles, and the environment. They are shifts that are "macro." Macroshifts drive toward the progressive integration of different peoples, enterprises, economies, societies, and cultures in systems of more and more people and larger and larger dimensions. They are more embracing than economic and political processes by themselves. Economic globalization and political integration are elements in macroshifts, but they are not the whole process.



In the past macroshifts were local, national, or regional. Today's macroshift is global. Humanity's sociocultural evolution has reached the dimensions of the planet. We are approaching the limits of sustainability in our globalized system — the status quo is no longer tenable. One or another of the available alternative paths of development must be entered upon. The alternatives are numerous and wide-ranging. They include on the one extreme a progression involving growing stress, conflict, and chaos, and on the other a development that leads toward sustainability and peace.



The scenario of breakdown is an alternative scenario of high intrinsic probability. It involves a series of increasingly stresses, leading ultimately to global chaos.

2005 –2015: Stress in the economic, social, and political system

- Resentment over economic and social injustice generates social and political unrest and revolt in various regions of the developing world

- Terrorism spreads, fuelled by resentment of the attempts of developed countries to capture and kill the terrorists without taking into account the reason why terrorism becomes rampant—the motivation of the terrorists and the populations that support them

· France, Russia, Chin, joined by Brazil, India, South Korea, and other developing countries, a form a coalition to balance what they perceive as intorelable U.S. military-economic hegemony

· There is a sharp rise in global military spending, as on the one hand the U.S. and its allies, and on the other the alternative bloc countries enter the arms race

· Global economic stagnation combined with U.S. unilateralism weakens the International Monetary Fund and the World Trade Organization and, as regional economic agreements become more attractive than multilateral trade arrangements and bilateral trade with the U.S., trade wars become frequent and increasingly destabilizing

- North-South trade agreements are cancelled and trade flows disrupted; the international economic/financial system is in shambles

- Corruption as well as maverick and organized crime spread on the six continents.

Degradation in the global ecology

- Water and food shortages in Sub-Saharan Africa, China, Southern Asia, and Meso-America generate water- and hunger-wars

- Starvation and unsanitary conditions accelerate the spread of HIV/AIDS, SARS, and other epidemics

· Last-minute and increasingly desperate efforts attempt to stave off the advent of a new ice age in Western and Northern Europe as the Gulf Stream vacillates and produces icy temperatures in spring and summer

- Millions of climate refugees from flooded coastal cities and low-lying areas and destitute urban and rural regions move inland on all continents.

2015—2020: The advent of a global holocaust

· Political and economic conflict between the U.S. and its allies, and the alternative military-economic bloc reaches a crisis point; hawks and armaments lobbies on both sides press for the use of weapons of mass destruction

- Strong-arm régimes come to power in many parts of the world, determined to use armed force to right perceived wrongs

· Regional wars erupt in the traditional hot-spots and spread to neighboring countries

· The major military-political-economic power-blocs use hi-tech weaponry to achieve conflicting economic and political objectives

- The new strong-arm régimes insert nuclear, chemical, or biological weapons to resolve regional conflicts

By the year 2020 war fought with conventional and nonconventional weapons escalates to the global level; the international economic and financial system is in chaos; political relations among states break down; anarchy and destruction become generalized.

Other scenarios are also available; even the scenario of breakthrough.

2005 –2010: The first steps toward a breakthrough

· The experience of terrorism and war, together with rising poverty and various environmental threats, among them the scarcity of clean water, trigger positive changes in the way people think. The idea that people themselves can be effective agents of transformation toward a more peaceful and sustainable world captures the imagination of individuals in more and more societies. People in different cultures and different walks of life pull together to confront the threats they face in common.

· The worldwide rise of popular movements for peace and international cooperation leads to the election of similarly motivated political figures, lending fresh impetus to projects of economic cooperation and intercultural understanding and to local and global measures to ensure the quality and quantity of water required to satisfy basic human needs as well as the sustainability of the most essential cycles of the biosphere

• Local, national and global business leaders adopt a strategy where the pursuit of profit and growth is informed by a search for corporate social and ecological responsibility

• An electronic E-Parliament comes on line, linking parliamentarians worldwide and providing a forum for debates on the best ways to serve the common good

• Non-governmental organizations link up through the Internet and develop shared strategies to restore peace, revitalize war-torn regions and environments, and ensure an adequate supply of clean water. They promote socially and ecologically responsible policies in local and national governments and in business

2010—2015: The crystallizing contours of peace and cooperation

· Money is re-assigned from military and defense budgets to fund practical attempts at conflict resolution and the implementation of internationally agreed and globally coordinated ecological sustainability projects

· A worldwide renewable energy program is created, paving the way toward a third industrial revolution making use of solar and other renewable energy sources to transform the global economy, provide clean water, and lift marginalized populations out of the vicious cycles of poverty

• Agriculture is restored to a place of primary importance in the economy, both for producing staple foods and for growing energy crops and raw materials for communities and industry

· Business leaders the world over join forces in creating a voluntarily self-regulating ecosocial market economy that ensures a fair access to natural resources as well as to industrial goods and economic activity to all countries and populations.

2015—2020: The emerging foundations of a planetary civilization

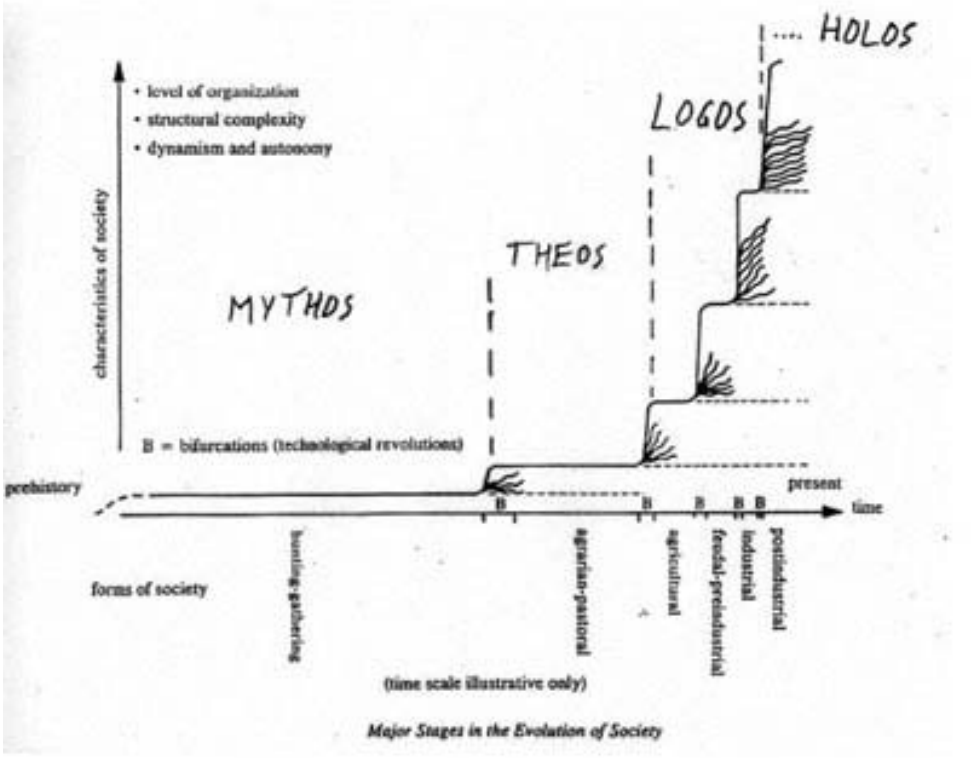
· The natural resources required for health and vitality become available to all the peoples and countries of the human community

· National, continental and global governance structures are reformed or freshly created, moving states toward participatory democracy and releasing a surge of creative energy among empowered and increasingly active populations

• The consensually created and globally coordinated ecosocial market system begins to function

• As a consequence international and intercultural mistrust, ethnic conflict, racial oppression, economic injustice, and gender inequality give way to a higher level of trust, and a shared will by the world's peoples to achieve peaceful relations among states and sustainability in the economy and the environment. Foundations are laid for a peaceful and sustainability planetary civilization.

Creating a planetary civilization calls for a major transformation, but such a transformation is not unique in the annals of history. It is part of a process of sociocultural evolution that began with the mythic civilizations of the Stone Age, continued with the theocratic civilizations of the archaic empires, and shifted to the civilizations based on human reasoning innovated by the ancient Greeks. This "Logos-civilization" survives to this day, albeit with the mixture of spiritual and theocratic elements. At present its reign is drawing to a close: the short-term rationality underlying the dominant form of this civilization produces more negative social, economic, and ecological side-effects than positive achievements. The time has come for a further civilizational shift: from the civilization of *Logos* to the civilization of *Holos*.



Major Stages in the Evolution of Society

The shift to Holos-civilization is necessary because the human/nature system on this planet has become a strongly interacting and highly interdependent quasi-living organism. Concern with just some of its elements to the exclusion or neglect of others leads to growing instability, and would ultimately lead to breakdown.

But the holism required for a new civilization is not a mysterious metaphysical quality. It is the adoption of the systemic approach without which no complex system be be safely and enduringly managed. The system we must now guide toward sustainable development is planet-wide; hence the holistic concern is at the same time a planetary concern.

Mythos and Theos were local or regionl; Logos has grown to the planetary dimension. At the planetary dimension Logos has outgrown its effective scope; it needs to be replaced. In place of the mechanistic and manipulative Logos, we must place a whole-system oriented Holos: the new planetary civilization.*

The fundamental transformation involved in the leap to planetary civilization is unprecedented only in regard to the speed with which it unfolds. In the past several generations could adapt their thinking and behavior before a fundamental civilizational shift was completed. Today the shift must be carried out within the span of the generations now living. This poses an unprecedented challenge. How it could be accomplished merits further thought.

3. THE CULTURAL FACTOR ON THE PATH TOWARD PLANETARY CIVILIZATION

The safest and most effective path toward planetary civilization is a cultural path: the path of adopting adapted values and behaviors. These need to emerge in a critical mass within civil society; for in the absence of such a cultural shift political and business leaders remain powerless to effect the necessary changes — the former for lack of popular support, and the latter for lack of suitable demand in the marketplace.

The requirement for a cultural movement that would be capable of producing motivation for moving toward planetary civilization is not utopian. In many parts of the world a variety of culture is surfacing that could be the harbinger of civilizational transformation. In this culture people are re-thinking their preferences, priorities, values, and behaviors, shifting from consumption based on quantity toward selectivity in view of quality defined by environmental friendliness, sustainability, and the ethics of production and use. Lifestyles hallmarked by matter- and energy-wasteful ostentation are shifting toward modes of living marked by voluntary simplicity and the search for a new morality and harmony with nature.

The people who join the new cultural movements are united by the aspiration to live a more simple, healthy, natural, and responsible life. They are appalled by what they see as the heartless impersonality and mindless destructiveness of establishment society. The rise of inner-city deprivation and violence, the drift toward anarchy and ethnic intolerance, the impotence of police and military measures to cope with it, the dissolution of the social contract between society and worker, and the rise of unemployment and homelessness prompt them to alter their thinking and their acting.

These changes in values and behaviors, although they are generally dismissed or underestimated, are rapid and revolutionary. For the present they are occurring at the margins of civil society, where a number of grassroots movements are opting out of the mainstream and are reforming themselves. Their members try to rethink the beliefs, values, and life ways that dominate their society, and adopt alternative patterns of personal and social behavior.

A hopeful culture is growing rapidly also in the United States, at the heart of the industrialized world. This is the finding of a series of opinion surveys carried out recently by organizations and individuals keen on tracing the evolution of the thinking and acting of Americans.

The Fund for Global Awakening implemented a survey aimed at elucidating the common values and beliefs held by people from diverse backgrounds. Carried out in the framework of the *In Our Own Words 2000 Research Program*, the survey distinguished eight “American types.” It found that 14.4% of the 1600 respondents — selected so as to represent a cross-section of American society — are centered in a material world. 14.2%

are disengaged from social concerns, 12.1% embrace traditional values, and 10% are cautious and conservative. These make up half of the U.S. population: the conservative, traditional half. Another 11.9% seeks to connect to others through self-exploration, 9.4% persists through adversity, 11.6% seeks community transformation, and 16.4% works for what the survey defines as a "new life of wholeness." These constitute the more creative and change-oriented half. Among them those who seek community transformation and work for a new life of wholeness make up 28% of the people.

The above finding matches the results of surveys carried out periodically in the 1990s by public opinion researcher Paul Ray. Ray called the significantly forward-looking and open segment of American society the "cultural creatives." The members of this emerging culture belong to the better-off classes, and they comprise nearly twice as many women as men. According to Ray, at the turn of the century the share of this culture was 23.4 percent of the U.S. adult population, not far from the 28% found subsequently by the *IOOW* survey.

The factor that identifies the cultural creatives is less what they preach than what they practice, for they seldom attempt to convert others, preferring to be concerned with their own personal growth. Their behavior, especially their lifestyle choices, differentiate them from the mainstream.

The common denominator of values and lifestyles among the cultural creatives is *holism*. This comes to the fore in their preference for natural whole foods, holistic health care, holistic inner experience, whole system information, and holistic balance between work and play and consumption and inner growth. They view themselves as synthesizers and healers, not just on the personal level but also on the community and the national levels, even on the planetary level.

Although the new culture at the margins of society is growing, its members are not well organized and the culture as a whole lacks cohesion. The cultural creatives do not yet possess the political, social, and economic weight to make them into a significant agent of societal transformation. If transformation of the required kind is to get under way, mainstream society would have to enter the scene, with more adapted values and priorities. But for the present, most people in the mainstream are disoriented and disheartened. They find themselves in a rat-race for economic survival in a world where jobs become ever scarcer and finding employment beyond middle age is nearly impossible. Those who pose deeper questions find that they are surrounded by a spiritual , moral, and intellectual vacuum. There are no meaningful answers to questions such as "Who am I? And "What am I living for?" The consequences include a continuing rise in the popularity of mystical teachings, and an explosion of religious fundamentalism.

4. ORIENTATION FROM THE NEW SCIENCES

There are elements of hope illuminating the seeming darkness of despair. The search for meaning and wisdom beyond the confines of the everyday world is basically a correct search. As former Czech President Vaclav Havel has said, "the authority of a world

democratic order simply cannot be built on anything else but the revitalized authority of the universe." A new civilization, capable of orienting people and providing the foundations for peace and cooperation can only be built when the "authority of the universe" informs the authority of the institutions by which people govern themselves in democratic societies. That more and more people are actively seeking a higher authority to conduct their affairs, looking beyond the dominant rationality of their society, means that a window may be opening for the motivation to enter on the path to planetary civilization.

Science is the best source we possess for discovering the authority of the universe. It is not only the fountainhead of the new technologies that are shaping our lives and everything around but also the basis for a trustworthy view of the world. Science could help people to adopt timely values and attitudes; even a suitable morality.

Science does not yet fulfill its transformation-facilitating potentials in modern society. Besides the separation of science from society — something that a number of leading scientists are actively attempting to overcome—a principal reason for the failure of people to look to science for guidance is that they hold an outdated view of what science is. In mainstream society people tend to believe that science is limited to observation, and the measurement and computation of observations. This is mistaken. Science is far more than a mere exercise in recording and computing; it is part of the perennial human quest for making sense of the world. At its best it is a search for meaning just as religion, art, and literature is. The difference between them is not in the ultimate end, but in the method of reaching that end. Science uses rational thinking in analyzing and interpreting what experience and experiment discloses, while religion combines such thinking with an element of unquestioning faith, and art and literature combine it with esthetic elements.

The current belief about science is a carry-over from the kind of science that had dominated most of the Modern Age. "Classical" science derived its view of the world from the theories of Galileo, Kepler, Newton, and Descartes. It viewed the world as a mindless, soulless domain of inert matter, blindly obeying the universal laws of motion and interaction. But the dominant view of science is misplaced in regard to what is often referred to as "the new sciences." At the cutting edge of the sciences the world is not seen as a machine that can be manipulated at will. It turns out to be very different from a simple world where things behave as solid material objects should behave and are either here or there and not in many places at once. Nor is the effect of one thing necessarily limited to just one or a few other things. True, such conditions hold in our immediate surroundings, but they turn out to be limited to certain orders of size and magnitude, and certain dimensions of speed and distance. Beyond these dimensions things become more and more strange. It is with good reason that a widely discussed film asks "what the bleep do we know?" and suggests that it is our consciousness that creates reality…

However, even if the world is surprising in light of science's new concepts, it is nonetheless comprehensible. The universe turns out to be meaningful; indeed, more meaningful than the mechanistic world where inert matter moves impersonally against a background of passive space. The whole world proves to be a harmonious structure

where all things interact with all other things and together create a coherent whole. This is not a mechanical aggregate, for it is not readily decomposable to its parts. It is an integral whole, where to some extent and in some way all things interact with all other things. And the scope of this interaction appears to transcend the hitherto known limits of time and space.

The findings that ground the new world picture of science come from almost all of the empirical disciplines, from physics, cosmology, the life sciences, and even consciousness research. Although the specifics of the phenomena on which they focus differ in detail, they have a common thrust. They speak of *interaction* that creates *interconnection* and produces instant and multifaceted *coherence*. The hallmark of a system of such coherence is that its parts are correlated in such a way that what happens to one part also happens to the other parts — hence it happens to the system as a whole. The system responds to the rest of the world as a whole, maintains itself as a whole, and changes and evolves as a whole. It *is* a whole: an integral whole.* This concept of the world could inspire people to deeper solidarity with one another and more respect for the integrity of nature.

The pertinent insight in this regard is that people wherever they live on the globe are just as connected to us as the birds in the sky, the trees in the forest and the fish in the sea. When moral people realize this they do not regard any person or culture as a stranger whose fate is a matter of indifference to them. They realize that they are part of a larger whole, and that either they co-evolve with all others within that whole or risk degradation and demise.

Wholeness and coherence can function as basic criteria of a more adapted morality. Given the overall trend toward wholeness and coherence in nature, we have sound reasons to consider actions that promote coherence and wholeness as good, and actions that hinder them as evil. We have sound reasons to seek wholeness both in us, and around us. Wholeness in us signifies the integral functioning of our organism: it means health. And wholeness around us means a healthy social community and an integral ecological milieu.

Wholeness in body and nature are not abstract ideals. Science now tells us that nature is a whole, and so is the biosphere; only human beings are a major factor of fragmentation and incoherence. This was not always the case: traditional societies respected the integrity of nature and, in times past, even the cosmic laws they believed govern the universe. The fragmentation and incoherence we have wraught in the modern world is an unintended evil. When we realize it for what it is, we shall overcome it. Science's discovery that we are connected to one another and to nature furnishes credible motivation for it.

The new sciences could be effective sources of wisdom in modern society. They could inspire greater solidarity in the human world, and greater concern with and care for the natural environment. They confirm that our fleeting impressions and intuitions of oneness are not figments of the imagination but have roots in the reality of the cosmos. We are indeed one with each other, with the living world, and with the universe at large, for we

are subtly but effectively connected. Our individual actions, and even our thoughts and intentions, affect other people around us, and are affected in turn by other people. This makes us part of a network of connection and wholeness. With this realization we could become part of the solution rather than remaining part of the problem. We could become moral agents seeking wholeness in as well as around us; conscious architects of a sustainable planetary civilization.

POSTSCRIPTS

I.

THE SHAPE OF PLANETARY CIVILIZATION

Visionary Reports from the Year 2020

Values, Lifestyles and the New Consciousness

Report by a young community counselor

The world in 2020 is in many respects similar to the world I knew as a young girl in the early years of this century. There are nearly 200 countries, some of them industrialized, others predominantly rural. Some of them make full use of the latest technologies, others prefer being guided by their traditions. There are two dozen giant cities, but they are not growing any bigger. Most people live in sustainable communities in medium-sized cities and towns and in rural environments. People are just as diverse as at the turn of the century, and since life is less stressful and more relaxed, cultural diversity can flourish without arbitrary constraints by hunger, joblessness, and heavy-handed bosses and governments. North Americans and Latin Americans, Japanese, Chinese, Indians and Asians, the same as Europeans, Africans, Australians and Polynesians, can express their values and safeguard their traditions.

Abject poverty has been all but eliminated: everyone's right to food, housing, education, and socially useful remunerated work is recognized and respected. We do not all live at the same material standard; some of us are more affluent than others. Yet the affluent among us do not use their wealth for ostentation and wasteful luxury. Even the comparatively rich adopt simple lifestyles, far simpler than those of rich people in the 20th century. They do so voluntarily—not just because legislation and taxes offer economic incentives, but because of a sense of responsibility for themselves, their neighbors, and their environment.

We do not believe that living well calls for amassing material goods. It means living comfortably, in some cases even luxuriously, but luxury does not lie in the quantity of the goods we own or control, but in achieving a high quality of lived experience. The dominant aspiration is personal rather than economic growth. It is the growth of

intellectual and emotional life, achieved not in the isolation of a private dwelling, whether mansion or hut, but in the embrace of family, community and country, and the global community of all peoples and countries.

As we join together to improve the quality of the living and working environment, our community life enjoys a renaissance. There is a renaissance of spirituality as well. More and more women and men rediscover a higher and deeper dimension of their life. Since physical existence is now more assured, there is less pressure on people, and this leaves more time for family, community and nature, as well as for inner development.

People live longer and healthier lives, but the population of the world is not growing any further. Longer lifespans are offset by smaller families as people realize that it is irresponsible to produce children beyond the replacement level. This has obvious benefits. With a modest family size we are able to take better care of our children, ensuring that they grow into healthy individuals, with sufficient education to live peacefully and sustainably, in harmony with human society and with nature.

The new consciousness

The changes we have wrought in the world are not the result of temporary trends and fads, nor do they obey the dictates of a higher authority. They result from the new mindset that emerged in my generation. This is a planetary consciousness, in some ways very different from the limited, ego-bound materialistic consciousness that dominated the world during my childhood in the early years of this century.

There are many things that differentiate the people of the Earth as we head into the third decade of the 21st century: religious beliefs, cultural heritage, economic and technological development, climate, and environment. Yet, notwithstanding our diversity, our new consciousness makes it possible for us to share some basic ideals.

As other people before us, we aim to achieve our own interests, yet we hope to achieve our interests consistently with the interests of all people whose interests are at stake.

We aim for democracy, yet for more than political democracy: we aim to ensure the best interests of all the citizens of our country.

It is our ideal to aim for fairness towards all people, but for more than fairness: for goodwill among peoples, nations, and cultures.

We aim for the rule of law, but for more than the means to enforce laws: to develop genuine respect for laws that protect the rights of individuals and states.

We also wish for economic success, but for more than the self-centered accumulation of riches: we aim to achieve conditions in which all people can enjoy an acceptable level of material well-being.

We aspire to social development, but to more than developed social structures and infrastructures: we wish to build a society that can ensure a high quality of life for all its people.

We ask for tolerance for different people and different cultures, but we wish to have more than mere tolerance: we aspire to find ways to actively pursue our shared interests, based on the unity that underlies our diversity.

We aim for freedom from oppression, hunger, and misery, but we strive for more than that: for the freedom also to develop our own self and personality, through responsible lifestyles of our choosing.

We aim for humanism in all actions and decisions that affect other people, but our humanism is not abstract: it embraces the planetary ethic of living in a way that allows all people to live in conditions that permit material well-being as well as spiritual growth.

Last but not least, we aim for personal, corporate, and civic goals without sacrificing or impoverishing the environment, and to reach such goals with full regard to the right to life of all the things that live on this planet.

We have come to some new insights.

We know, and feel with every cell of our body, that all seven billion of us are inhabitants of Earth, with an equal right to enjoy its resources and its life-supporting environment.

We are convinced that it is immoral for any of us to live in a way that detracts from the chances of the rest of us to achieve a life of basic well-being and human dignity.

We believe that the universal rights adopted by our forebears in the 20th century—the right to freedom of expression, freedom to elect our leaders, and freedom from torture and other arbitrary constraints on personal liberty, as well as the right to food, shelter, education, and employment—apply to everyone in the global community, and deserve to be respected above and beyond considerations of personal, ethnic, and national self-interest.

We realize that it is more effective to exercise responsible trusteeship of the human and natural sources of wealth on this planet than to exploit them for narrow and short-term benefit.

We recognize that nature is not a mechanism to be engineered and exploited, but a living system that brought us into being, that nourishes us and, given our awesome powers of exploitation and destruction, is now entrusted to our care.

And we have learned that the way to solve our problems and conflicts is not by attacking each other, but by opening ourselves up to a dialogue that leads to a better understanding of each other, and to cooperating in ways that serve our joint interests.

Politics, Economics and Technology

Report by a young school-teacher

The nations of this world are free to choose their preferred social structures and economic systems—ours is a world rich in diversity. Yet diversity does not spell conflict and disunity. We have not fragmented the human community into isolated units pursuing separate goals without regard for the common good. Our diverse nations and cultures are united by common values and aspirations, centered on creating a world where all people can live safely and peacefully, without destroying the life-sustaining environment.

It is a measure of our achievement that the fears that dominated the first decade of this century—fears of terrorism, armed conflict, economic breakdown, famine, ecological collapse, and invasion by destitute migrants—are behind us. Stability is the hallmark of our world. This is not the rigid stability imposed by a powerful authority, but the stability of a sustainably built network of self-reliant but cooperative communities, states, nations, and continental and subcontinental federations of nations.

Our system of political organization

The 20th century's system of self-centered nation states has been transformed into a transnational system, organized as a series of administrative and decision-making forums, with each forum having its own sphere of competence. This is not a hierarchy, for the forums at the various levels have considerable autonomy and are not subordinated to the higher levels. In the areas of peace and security, the protection of the environment, information and communication, as well as international finance, decision-making is global. But there is significant autonomy at local and regional levels. The world is a "heterarchy": a multilevel structure of distributed decision-making. It is aimed at combining global coordination with local, regional, and national autonomy.

Multiple links of communication and cooperation criss-cross our interlinked social, political and economic systems. Individuals jointly shape and develop their local communities. These communities participate in a wider network of cooperation that includes, but does not stop at, the level of nations. Nation-states in their turn are part of continental or subcontinental social and economic federations.

For linking the whole world we have the United Peoples' Organization, the body that succeeded the United Nations. The UPO observes, as do all other decision-making bodies of the world, the well-known but previously seldom respected "principle of subsidiarity." This means that decisions are made at the lowest level at which they are effective. The global level of the UPO, the world's highest level of decision making, is at the same time the lowest level at which peace and security can be effectively safeguarded, the world environment can be cared for, and the flow of money, technology, and information across the continents can be regulated. All other issues of public policy are the concern of communities, states, and federations at subsidiary levels of decision-making.

The UPO's political members are continental and subcontinental economic and social federations representing the shared interests of their member nations. They include the European Union, the North American Union, the Latin American Union, the North-African Middle-Eastern Union, the Sub-Saharan African Union, the Central Asian Union, the South and Southeast Asian Union, and the Australian-Nippon-Pacific Union.

The system of regional federations constitutes the Peacekeeping Council of the UPO, operating with a mandate similar to that of the former Security Council, but without the two-tier structure where some members are permanent and others not, and some have veto-power and others do not. The Peacekeeping Council commands the sole military force in the world: the United Peacekeeping Force. The UPF is staffed by contingents from the member states of the federations. It undertakes peacekeeping missions on the request of the member federations.

The United Peoples' Organization is not uniquely a political organization: it has members also from civil society and business. Civil society members include various non-governmental organizations, active in social, economic and the environmental domains. Thanks to their membership, the voice of the international NGO community is no longer foreign to policy-making in the world; it is an integral part of deliberations and decisions in all the relevant areas.

The corporate membership of the Organization is made up of federations of businesses in the major branches of the private sector. Through specialized agencies in finance, industry, commerce, and labor, inherited from the United Nations and reformed in the light of the Organization's enlarged mandate, the UPO connects its member business federations with the representatives of the communities in which they operate. It helps managers establish good community relations, create mutually agreed codes of conduct, and reach mutually beneficial agreements on trade, employment, finance, and the protection of the environment.

Global-level coordination is a precondition of successfully restoring the viability of the environment, re-establishing natural balances in the composition of air, water, and soil, and preserving the integrity of the biosphere's regenerative cycles. Thus the World Environment Organization has been created as an affiliate of the UPO, to coordinate the environmental programs of the continental and subcontinental federations.

The continental and subcontinental level is effective for coordinating decision-making at the next subsidiary level: the level of nation-states. The economic and social federations provide a forum for the representatives of member nations to discuss their concerns, explore areas of mutual interest, and coordinate their political goals and social-economic practices.

The tasks and responsibilities of nation-states have not changed significantly. National governments remain the principal arbiters of their country's economic and social objectives. Nation-states maintain a national treasury, a national judicial system, police force, and health system. But these institutions do not operate under the premise of

absolute sovereignty. Domestically they are integrated with the administrations of cities and rural areas, and internationally with the structures and policies of other states in the federation to which a given nation belongs.

The local level of coordination and decision-making serves cities, towns, and villages. At this level direct democracy is the rule. The representatives of the people respond directly to the people. The customary mechanism is the town hall meeting, held face to face whenever and wherever possible, and electronically when distance or cost prevents a significant number of people from participating.

Our system of economic organization

National economies seek their own balance between market forces, the valuation of natural assets, the environment, and social welfare. Some countries provide a guaranteed income for their people in order to assure their basic needs. Previously unpaid work, such as maintaining a household, caring for others and for the environment, and growing one's own food, is recognized to be socially and economically useful. In this way people in the majority of today's nation-states do not depend on competing in the market for staple food, shelter, and basic education. They can choose their preferred work or profession free of existential worries.

Achieving full sustainability in our economies is not utopian. Economic systems have shifted their goals and operating principles. They attempt to live on "natural income" rather than "natural capital." Natural capital consists of the accumulated riches of the earth, used and discarded, as in the burning of fossil fuels. When such capital is depleted, the economic system based on it goes bankrupt—it is intrinsically unsustainable. Natural income, on the other hand, embraces all natural resources that can be renewed or replenished, or recycled. Such use of resources can be prolonged indefinitely: the economy based on it is sustainable.

A corresponding shift has occurred regarding the use of resources. Not merely increasing labor-productivity is the objective, which has been the principal goal and preoccupation of managers for most of the 20th century, but increasing resource-productivity. This means more than squeezing the maximum out of every kilogram of material and kilowatt of energy. It means designing production processes so that the least amount of nonrenewable resources is used and the share of renewable and recyclable resources is maximized.

Thanks to efficient resource use, less waste and simpler lifestyles, the size of the ecological footprint of cities and economies has dropped in all parts of the world. The size of the footprint of individuals is approaching the sustainable Earth-share: on the average it is not much above two hectares per person.

The world's monetary system has undergone much-needed reform at all levels — global, regional, as well as local. We no longer use US dollars and Euros, or other national and continental currencies as if they were global ones. The UPO issues a world currency, the

Gaia, on the basis of the population of an economic and social federation rather than its economic strength. The federations have their own currencies, which they spend into circulation and take back through taxes. Their currencies are used for trade between a federation's member states; the Gaia is reserved for inter-federation transfers. As a result of such reforms even the least developed economies have overcome abject poverty, dependency and marginalization.

Business and politics are no longer at odds. Without dictates from above, the private sector is becoming a voluntary part of civil society. The aspiration of business managers is not solely the increase of shareholder value through a company-centered exploitation of all available resources, but to live up to the ethic of trusteeship of the shared wealth-producing assets.

Managers are concerned about assuring success for their companies, but like some business leaders in the 19th and early 20th century, they also seek a place among the builders of society. They endeavor to overcome the tension between efficiency, profitability, and dynamism on the one hand, and solidarity, equity, and sustainability on the other. They select the products and services they bring to the market in consultation with their clients and customers, as well as with their employees and partners. Even if production and marketing decisions are made with an eye towards success in the marketplace, they are informed also by regard for impact on the environment, employee satisfaction, and the human and social utility of the company’s products and services. In consequence, much of the wastefulness of last century’s throwaway culture is eliminated; built-in obsolescence has become obsolete in itself.

Technology is no longer valued for itself. We seek to make technology our servant rather than our master. Most of our technologies are more advanced than those of the early 21st century, but not all technologies that are available are actually put to use. Social utility and environmental friendliness are major factors in choosing which technologies to develop.

A major change in the use of technology occurred in the aftermath of the deepening conflicts and escalating wars of the first decade of the century. The leaders and peoples of the world realized that there are no reliable measures to prevent technologies intended for defense being used for aggression, with disastrous consequences. Since it was not feasible to eliminate weapons of mass destruction from the arsenal of all states as long as any state possessed them, the members of the United Peoples Organization decreed worldwide disarmament, with implementation vested in the continental and subcontinental federations. In consequence in the armaments field research and development focuses not on producing more and more potent devices for killing and destruction, but on effective and reliable ways to verify that they are not being produced by any nation in the world.

There has been a corresponding de-escalation in the civic use of weapons. Criminality and violence are at a low level, thanks to improved social conditions and more balanced development in the economic sphere. With a lower level of frustration there is less

resentment and hate, and the near-inaccessibility of lethal weapons reduces the incidence of gang-wars, massive killings and organized crime. There is no longer need for large, highly equipped police forces and high-security prisons. With the exception of special forces, law-enforcement officers are equipped much as 20th century English policemen were—with rubber sticks and handcuffs, occasionally supplemented by temporarily disabling non-invasive lasers.

The most important advance in technological development is in the way we derive the energies we need. We have eliminated risky nuclear reactors and greatly reduced our use of fossil fuels. Nearly half of our energies come from the sun, as a direct source through photovoltaic and solar thermal technologies, and indirectly in the form of hydropower, wind, wave, tidal, geothermal and biomass-based energy. Our entry into the "solar age" not only brings a practically infinite source of energy without polluting air, land and water, but also helps re-balance the world's economy, since solar radiation reaches almost everywhere on the six continents, and is particularly intense in the tropical and sub-tropical regions where many of the world's poorer people are concentrated.

In industrial production, current technologies produce what is needed and beneficial without creating eliminable side effects. There have been great improvements in recycling industrial and household wastes, and in eliminating by-products that pollute air, land, and water. The ultimate aim is to achieve zero waste.

In agriculture the emphasis is on maintaining biological diversity and producing a safe and sustainable supply of basic foods. We realize that the human body is part of terrestrial nature and natural foods are the best suited to maintaining its health and vigor. In addition to food production, agriculture is a source of natural energies and raw materials. Plants such as hemp grow prolifically almost everywhere, and they offer a renewable raw material for producing paper, textiles and oil, as well as some new varieties of plastics.

Much effort is devoted to ensuring a sustainable supply of clean water. A worldwide program to replant our forests has helped to reduce droughts and rebalance the climate. In arid coastal regions traditional sources are supplemented by desalinated seawater.

Our transport technologies aim at reconciling the requirement for mobility with the requirement for personal safety and public health. This is much less of a problem than it was at the turn of the century, for the emphasis on local self-reliance and autonomy reduced the need for people and goods to move long distances. The valuation of natural assets has been another factor: it made us aware that energy, even if renewable, is to be used with care, and that transport systems, even when ecological, have an unavoidable negative impact on nature. This impact is limited, but not totally eliminated, by the use of clean renewable energies, such as plant-based fuels, liquid hydrogen, electricity, fuel cells, compressed air, and various hybrid motive technologies adapted to local conditions and requirements.

The communication technologies in use today are highly advanced, but they are not substantially different from those of the early years of the century. Hardware is smaller, cheaper, and more powerful, and software is both simpler and more effective, adapted to use by people in all walks of life. Computers are at work in many facets of daily life and work. They eliminate some chores and make others easier, but they do not revolutionalize our existence in the way technological forecasters and science fiction writers envisaged. We still live on Earth in human communities and the embrace of nature. We make use of technology to live better and more sustainably.

Advances in health-related technologies make a further contribution to our quality of life. Invasive medical procedures are limited to cases of birth defects, accidents, and serious malady. A softer and more holistic approach predominates in most other cases. The accent is on the maintenance of health through the prevention of disease, and this requires that we consider the human being as an integrated whole of body and mind, and an integral part of his or her society, culture, and environment.

The techniques that foster our inner development are an offshoot of our holistic approach to health. These "soft technologies" combine ancient methods with new biomedical and psychophysical methods. They are recognized adjuncts to human growth and development, and they are widespread and widely accepted.

People are still people, the Earth is still the Earth, but, as the young community counselor just told you, we have new thinking and a new consciousness. This has made the crucial difference. As the consciousness of individuals evolves, society reaches a new stage of maturity. It has a greater capacity for self-determination with more detachment and level-headedness; it is more inclusive, embracing people from differing ethnic groups, races and religions in a search for common ground; it is more anticipatory, assessing the merit of today's decisions in light of their effect on other people as well as on future generations, and it is more flexible, able to mobilize people's will and shared resources without waiting for crises to force last-minute responses.

II.

FOUNDATIONS OF THE HOLISTIC WORLDVIEW OF THE SCIENCES

As noted above, in the emerging worldview of the sciences the entire universe is an interconnected coherent whole. What is the explanation of this remarkable finding? The principal strands of evidence can be briefly summarized.

The evidence for connection and coherence in nature comes from many disciplines and it is entirely cogent.

• Close connections surface on the level of the quantum: every particle that has ever occupied the same quantum state as another particle remains subtly but effectively correlated with it.

• The universe as a whole turns out to be "nonlocal," manifesting astonishingly fine-tuned correlations among its laws, constants, and parameters.

• Biologists and biophysicists discover similarly puzzling correlations both within the organism, and between the organism and its environment.

The new finding of connection and coherence in the various domains of investigation ground an important novelty among the fundamental concepts of science. The connections that make for a coherently evolving cosmos, for the entanglement of quanta and for the instant connection between organisms and environment suggest that there is more to the universe than matter, energy, and space and time. There is also an element that connects and correlates. This element is as much a part of the universe as the electromagnetic, the gravitational, and the nuclear fields. It, too, is a field — a field that is as fundamental as electromagnetism and gravitation, and the attracting and repulsing fields of the atomic nucleus.

The idea of a deeper layer of reality that subtends the universe and connects all things in it dawned gradually in the course of the twentieth century. At the beginning of that century cosmic space was believed to be filled with an invisible energy field: the luminiferous ether. The ether was said to produce friction when bodies move through it, slowing their motion. But such friction failed to materialize. It was not detected in the beginning of the 20th century in the famous Michelson-Morley experiments, and as a result the ether was soon removed from the physicists' world picture. The absolute vacuum — space that is truly empty when not occupied by matter — took its place.

The vacuum, however, turned out to be far from empty space. In the "grand unified theories" (GUTs) developed in the second half of the twentieth century the concept of the vacuum transformed from empty space into the medium that carries the zero-point field, or ZPF. (The name derives from the fact that in this field energies prove to be present even when all classical forms of energy vanish: at the absolute zero of temperature.) In subsequent "super-GUTs" the roots of all of nature's fields and forces are ascribed to the complex energy sea known as the "unified vacuum"—which, significantly, is also called the "nuether."

The vacuum is both the originating ground and the ultimate destination of the particles that furnish the universe. The particles first arose from the vacuum in the Big Bang, and they continue to spring forth in a process known as pair-creation. When energy beyond a very high threshold is injected into the vacuum (for example, in particle accelerators), a particle and an antiparticle spring forth. If they do not meet and annihilate each other, the positive particle establishes itself and the negative particle remains as a hole in the vacuum.

Positive particles are the furnishings of the observable universe. But eons later, in the final collapse of black holes, their degenerate remnants die back into the vacuum, and the matter that until then had populated the universe becomes virtual again.

The vacuum is not only the womb and the grave of the particles that are the basic units of the observable universe, it is also a cosmic resonance board that continually interacts with it. Harold Puthoff, Bernhard Haisch, and collaborators produced a sophisticated theory according to which the inertial force, the gravitational force, and even mass are consequences of the interaction of charged particles with the vacuum. More than that: the very stability of the atom is a consequence of vacuum interaction. The electrons orbiting the atomic nucleus constantly radiate energy, and they would move progressively closer to the nucleus were it not that the quantum of energy they absorb from the vacuum offsets the energy lost due to their orbital motion.

The stability of the Earth's orbit around the Sun is likewise due to interaction with the vacuum. As our planet pursues its orbital path it loses momentum, and given a constant loss of momentum, the gravitational field of the Sun would overcome the centrifugal force that pushes the Earth around its orbit: our planet would spiral into the Sun. This does not take place because the Earth is constantly deriving energy from the vacuum. Inertia, mass, gravity, and the stability of the atom as well as of the solar system are all due to vacuum interaction.

In addition to gravitation, inertia, mass, and orbital stability, the interconnection of all things in the universe is likewise due to their interaction with the vacuum. It is now becoming recognized that the zero-point field of the vacuum connects things in space and time. Physicist Harold Puthoff noted, "…on the cosmological scale a grand hand-in-glove equilibrium exists between the ever-agitated motion of matter on the quantum level and the surrounding zero-point energy field. One consequence of this is that we are literally, physically, 'in touch' with the rest of the cosmos as we share with remote parts of the universe fluctuating zero-point fields of even cosmological dimensions." The experience of Apollo astronaut Edgar Mitchell in space led him to a similar conclusion. According to Mitchell, the quantum vacuum is the holographic information field that records the historical experience of matter.

Although the effect is subtle, the vacuum interacts with all things in space and time. In the language of physics, particles "excite the vacuum's ground state." Russian physicists Anatoly Akimov, G.I. Shipov, and V.N. Binghi produced a mathematically elaborated theory of this excitation. In their theory the vacuum is a physical substance extending throughout the universe: it registers and transmits the traces of charged particles and objects built of such particles. All particles and objects create torsion-waves in the vacuum. The vortices of these waves are information carriers, linking physical events nearly instantly: their group speed is of the order of 109 c — one billion times the speed of light!

Wave-linking through the vacuum involves more than energy: it also involves information. It is standard knowledge that particles that have a quantum property known

as “spin” also have a magnetic effect: they possess a specific magnetic momentum. Hungarian theoretician László Gazdag pointed out that this magnetic impulse may be registered in the vacuum through minute vortices. (Whether waves create vortices in water or in the vacuum, they consist of nuclei around which circle other elements — H_20 molecules in the case of water, and virtual bosons in the case of the vacuum.) In this way vortices carry information in the vacuum, much as magnetic impulses carry information on a computer disk.

The information carried by a given vacuum vortex corresponds to the magnetic momentum of the particle that created it: it is information on the state of that particle. These minute vortices interact. When two or more torsion waves meet, they form an interference pattern that integrates the strands of information on the particles that created them. Thus the interference pattern carries information on the entire ensemble of the particles.

In simple terms we can say that vortices in the vacuum record information on the state of the particles that created them — and that their interference pattern records information on the ensemble of the particles of which the vortices have interfered. In this way the vacuum records and carries information on atoms, molecules, organelles, cells, even on organisms and populations of organisms. There is no evident limit to the information that interfering vacuum-waves could record and conserve. In the final count, the quantum vacuum records and conveys information on the state of the whole universe.

Vacuum-conveyed information is present wherever the vortices that carry it have reached, for the information is in a distributed form. In this it is similar to the way information is present in a hologram, where the entire image of the recorded object is enfolded throughout the interference patterns on the film — it reappears whenever any part of the film is illuminated.

Interfering vacuum-vortices are nature’s holograms. They carry information on all the things that excite the vacuum, that is, on all things throughout the universe. Thus there is a deeper reality in the cosmos, a reality that connects and makes whole.

The discovery of a deeper reality that records information and connects recalls the ancient intuition of an “Akashic Record”: the cosmic record of all the things that happen and have ever happened in the world. For this reason the vacuum-based holofield can be meaningfully named “Akashic-“, or simply “A-” field. The A-field joins science’s G-field (the gravitational field), the EM-field (the electromagnetic field), and the attractive and repulsive short-range fields of the atomic nucleus as a fundamental element of reality. It connects organisms and minds in the biosphere, and particles, stars, and galaxies throughout the universe. It transforms a universe that is blindly groping its way from one phase of its evolution to the next into a strongly interconnected system that builds on the information it has already generated.

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* The contours of such a planetary civilization are sketched in a visionary way in Postscript I, below.

* For further details regarding the worldpicture of the new sciences, see Postscript II.

(Updated Apr 9, 2007)