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“Planning and the Paradox of Conscious Purpose”

Gary J. Coates

PREPARED FOR RESETTLING AMERICA: ENERGY, ECOLOGY & COMMUNITY

. . . And what you thought you came for
Is only a shell, a husk of meaning
From which the purpose breaks only when it is fulfilled
If at all. Either you had no purpose
Or the purpose is beyond the end you figured
And is altered in fulfillment

—T.S. Eliot, from
“Little Gidding”

Hui Tzu said to Chuang Tzu:
“All your teaching is centered on what has no use.”

Chuang replied:

“If you have no appreciation for what has no use
you cannot begin to talk about what can be used.
The earth, for example, is broad and vast
but of all this expanse a man only uses a few inches
upon which he happens to be standing.
Now suppose you suddenly take away
all that he is not actually using
so that, all around his feet a gulf
yawns, and he stands in the void,
with nowhere solid except right under each foot:
how long will he be able to use what he is using?”

Hui Tzu said: “It would cease to serve any purpose.”

Chuang Tzu concluded:

“This shows
the absolute necessity
of what has ‘no use.’”

—Chuang Tzu, from
Thomas Merton, *The Way of
Chuang Tzu*

Since the discovery of fire, and in the past 7,000-10,000 years with the development of agriculture and the establishment of fixed settlements, the evolution of human culture has been the reverse of that of organic systems. Rather than moving toward greater complexity, diversity, symbiosis and stability, human dominated ecosystems have moved progressively toward simplicity, homogeneity, competitive exploitation and fragility. No other species has had the capacity to alter so drastically its environment to meet its own needs, and humanity has had neither the self control necessary to temper its demands nor the wisdom necessary to regulate effectively the environments it has had the power to create. So far, this unhealthy combination of intemperance and ignorance has proven disastrous for both nature and culture.

A civilization comes into existence through the development of new ideas, myths and technologies and through the harnessing of energy for the exploitation of nature and the domination of other human groups. When the limit of that particular form of exploitation is reached the civilization declines, often having consumed the material resources upon which it has come to depend, as well as its capacity for adaptive change in the face of new social, political and ecological realities. It is estimated that as many as 30 civilizations have followed this cycle of growth and decline through the loss of evolutionary potential, leaving behind a legacy of deforested hillsides, human-created deserts, and plains and river valleys denuded of topsoil where there was once fertile and abundant life.

Industrial civilization, through its use of fossil fuels and high energy technology, has managed to accelerate this anti-ecological and anti-evolutionary trend and has brought the entire planet within the orbit of its destructive influence. As a result, the whole earth is rapidly becoming a single ecosystem. This is an unprecedented development in evolutionary history and has serious implications. Life came into existence and has continued to evolve precisely because of the relative isolation and independence of ecosystems which comprise the thin layer of life known as the biosphere. Kenneth Boulding considers the recent emergence of a single interdependent global village to be a major threat to human survival.

. . . The world has not been a single ecosystem, but a mosaic of relatively isolated ecosystems with some possibilities of migration between them. Consequently, if a catastrophe wiped out one ecosystem, it did not wipe out all of them. Evolution was able to continue and eventually colonize the disaster area. The eruption of Krakatoa undoubtedly eliminated the total biological ecosystem of that island. Now after almost a hundred years it has been reestablished, perhaps not quite the same as it was before, but with innumerable species of all forms of life having colonized it from the undisturbed areas. Similarly, the Mayan civilization collapsed in about 900 A.D., quite irrecoverably, from the point of view of its own system. This did not affect either Europe or China, which knew nothing about it, and the catastrophe had very little impact on the general course of social evolution. On the other hand, if we have a single world ecosystem, a single world society, then if anything goes wrong, everything goes wrong: if there is any positive probability of irretrievable catastrophe, then if we wait long enough it is almost certain to happen.¹

As we have seen, this thin film of industrial culture that now envelops the earth, destroying indigenous cultures and disrupting the world's major ecosystems, is entirely dependent on nonrenewable resources that are certain to be effectively exhausted within the lifetime of someone born today.² The probability of “irretrievable catastrophe” for industrial civilization is rapidly approaching 100 percent, a fate which is now positively correlated with that of non-industrial cultures as well as the major living systems of the earth.

Thus, the crisis of industrialism raises serious questions about the ultimate viability of nature's experiment in human intelligence. Unless something is done to alter radically the present course of events we must ask whether or not *homo sapiens* will prove to have been "merely an evolutionary anomaly bound to be destroyed by its own contradictions, or the contradictions of its products?"³

At their root, then, the problems which confront us are far deeper than issues of resource availability or questions of technology. We must ask how the human species, itself a product of organic evolution, could have developed into such a threat to the very forces which have created it. Gregory Bateson suggests that the anti-ecological animus of human civilization is the result of the exercise of purposive consciousness in behavior which seeks to achieve narrowly defined human ends without concern or regard for the circular structure of cause and effect which characterizes the functioning of the rest of the living world. Since purposefulness is intrinsic to the functioning of consciousness, and since all human action is, to a certain extent, guided by the desire to achieve some future state through some present action, this diagnosis suggests a paradox central to the human condition: In order to survive we must act purposefully; yet, to act purposefully leads us to disrupt the systems upon which we depend for survival. Moreover, since purpose is intrinsic to the nature of consciousness, it is not possible to renounce its use.

Thus, like the riddle of the Sphinx, or a Zen koan, the crisis of industrial civilization presents us with a paradox which must be resolved if we are to continue to exist as a viable life form. Unless we can find a way, both individually and collectively, to transcend this paradox of conscious purpose, we shall continue to win the battle for the domination of nature but lose the war of survival.

Before presenting some tentative suggestions for a way out of this dilemma, let us explore in more detail the nature of conscious purpose and its effects on the evolution of culture. We shall then be in a position to examine the systemic flaws in the organization of industrial civilization. By thus understanding the nature of the problem, perhaps we can come to an understanding of the nature of the solution. Whether or not any such theoretical formulations can, or will, be implemented, is something else again.

CONSCIOUS PURPOSE

Bateson defines human consciousness as a relatively autonomous subsystem of the total mind/body of the individual organism. Because it is a part of a larger whole it is logically impossible for information about the whole system to be displayed on the "screen of consciousness." The information that does manage to become known to us is first selected from the total information available by the totally unconscious process of perception. We first transform the world into images through our senses and it is these images which become the basis for our necessarily limited consciousness of both internal and external reality.

Now, perception itself is shaped by purposes. We tend to see what we look for and what we look for is what is relevant to our purposes. This highly selective filtering process is a characteristic of all living systems from cells to ecosystems. If this were not the case, if the organism did not respond only to those stimuli that correspond to its own needs and capacities and remain blind or indifferent to everything else, it would not survive long.

So the structure of selective attention, characteristic of human perception and consciousness, is not unique to the human species. In fact, the *Umwelt*, or enclosing world, of the human organism is much wider and more diverse than that of any other species. Not only does it include the relevant portion of the immediately present world of nature, but it also includes broad expanses of time as well as the complex world of society and the equally complex inner world of personal feelings, needs and values.⁴ Nevertheless, the world in which we live is not reality "as such," but is a culturally defined, personally constructed description of reality. However, because of the unconscious nature of the process of perception, it appears to us that we experience and inhabit an objectively real world that is accurately and faithfully reported to us by our sensory apparatus. We believe and act as if the map is the territory. This fundamental error in epistemology creates no end of problems, not the least of which is the failure to see the role played by purpose in shaping our image of nature, self and society. Thus, our conscious image of reality is a systematic distortion of its true nature, and action based on such reifications inevitably creates problems. As our power to act on the world increases, the problems that are created also increase. This is a uniquely human

problem, since no other species is able to reshape consciously the world to correspond to its own perceptions and purposes to the extent that we can.

Purposive consciousness, then, can be described as a "short-cut device to enable you to get quickly at what you want; not to act with maximum wisdom in order to live, but to follow the shortest logical or causal path to get what you next want . . ." ⁵ Thus, while it can produce a useful "bag of tricks," such an instrumental rationality can never produce wisdom, which Bateson takes to be a knowledge of the interactive loop structure of complex systems of mind and nature. Consequently, "if you follow the 'common sense' dictates of consciousness, you become, effectively, greedy and unwise." ⁶

It should come as no surprise, then, that industrial civilization, which has succeeded in implementing the narrowly conceived purposes of human consciousness with an unprecedentedly powerful technology, has become the most destructive, life-denying social system ever devised. But, as Bateson explains in the following story, the continued violation of the wisdom of a system is always disastrous to the violator:

Lack of systemic wisdom is always punished. We may say that the biological systems—the individual, the culture, and the ecology—are partly living sustainers of their component cells or organisms. But the systems are nonetheless punishing of any species unwise enough to quarrel with its ecology. Call the systemic forces "God," if you will.

Let me offer you a myth.

There was once a Garden. It contained many hundreds of species—probably in the subtropics—living in great fertility and balance, with plenty of humus, and so on. In that garden, there were two anthropoids who were more intelligent than the other animals.

On one of the trees there was a fruit, very high up, which the two apes were unable to reach. So they began to *think*. That was the mistake. They began to think purposively.

By and by, the he ape, whose name was Adam, went and got an empty box and put it under the tree and stepped on it, but he found he still couldn't reach this fruit. So he got another box and put it on top of the first. Then he climbed up on the two boxes and finally he got that apple.

Adam and Eve then became almost drunk with excitement. *This* was the way to do things. Make a plan, ABC and you get D.

They then began to specialize in doing things the planned way. In effect, they cast out from the Garden the concept of their own total systemic nature and its total systemic nature.

After they had cast God out of the Garden, they really went to work on this purposive business, and pretty soon the topsoil disappeared. After that, several species of plants became "weeds" and some of the animals became "pests;" and Adam found that gardening was much harder work. He had to get his bread by the sweat of his brow and he said, "Its a vengeful God. I should have never eaten that apple."

Moreover, there occurred a qualitative change in the relationship between Adam and Eve, after they had discarded God from the Garden. Eve began to resent the business of sex and reproduction. Whenever these rather basic phenomena intruded upon her now purposive way of living, she was reminded of the larger life which had been kicked out of the Garden. So Eve began to resent sex and reproduction, and when it came to parturition she found this process very painful. She said this, too, was due to the vengeful nature of God. She even heard a Voice say "In pain shalt thou bring forth" and "Thy desire shall be unto thy husband, and he shall rule over thee."

The biblical version of this story, from which I have borrowed extensively, does not explain the extraordinary perversion of values, whereby the woman's capacity for love comes to seem a curse inflicted by the deity.

Be that as it may, Adam went on pursuing his purposes and finally invented the free-enterprise system. Eve was not for a long time, allowed to participate in this, because she was a woman. But she joined a bridge club and there found an outlet for her hate.

In the next generation, they again had trouble with love. Cain, the inventor and innovator, was told by God that "His (Abel's) desire shall be unto thee and thou shalt rule over him." So he killed Abel.⁷

Now, Bateson's version of the Biblical myth of the fall of man (and woman, of course) from the Garden has been quoted in full because it not only contains an explanation of the epistemological and psychological implications of conscious purpose but it also demonstrates what happens when conscious purpose is allowed to dominate the process of social evolution, as it has since the rise of the first great hydraulic civilizations in the Middle East, Africa, and China. The myth of the Garden is human history miniaturized and accessible to conscious inspection. Let us take a closer look at it.

The story begins with the description of a condition of balance between nature, culture and consciousness. It is the mythical Golden Age in which the world is a harmony of opposites, a unity through diversity. But the potential for the loss of innocence and order is built into the very structure of the situation. Each complex system that is mentioned—the Garden as a whole, the two anthropoids, and each of the myriad species of plants and animals which comprise the Garden—is made up of a vast number of interrelated but relatively independent subsystems, each of which would go into exponential runaway if uncorrected by a vast number and variety of feedback loops and control circuits that maintain key system variables within the homeostatic ranges necessary for their adaptation and survival. These regulatory mechanisms ensure that no part is able to promote its own special purposes to the detriment of the whole. As long as this is the case, the Golden Age will continue and the Garden will remain a self-regulating, self-repairing, and self-organizing system.

However, this is not to be. There is one species which has the power to reshape the Garden in its own image, and for its own ends. The two anthropoids, who presumably have already developed their capacity for language, are about to break with their evolutionary past and begin the long, sad process of cultural evolution, or history.

What sets this sequence in motion? Adam and Eve, no longer satisfied to accept the fruits of the Garden as a gift of God, make the decision to take what they desire. So they must have a fruit located beyond their human and biological dimensions. This is a subtle and profound shift in orientation to the world. An Arcadian life of biological adaptedness to nature is about to be replaced by a Promethean search for a humanized nature.⁸

Before this momentous decision, Adam and Eve had lived in God's "Grace," the state of being where it is understood "that everything gained and everything claimed follows upon something given, and comes after something gratuitous and unearned; that in the beginning there is always a gift." By rejecting this idea that life is, in a fundamental sense, a gift of the larger systems of which they are a part, Adam and Eve are rejecting the sacredness of that which they cannot understand. As a result of this first step toward the desecralization of nature, Adam and Eve are stating, in a paraphrase of a famous modern corporate slogan, that "what is good for the anthropoid is good for the Garden."

Now what is the next step after this fall from "Grace?" It is the invention of technology. Adam does not ask God for the fruit. He improvises an instrument which allows him to reach it himself. He becomes, *homo faber*, man the maker. Rather than changing himself to fit the environment, he invents a tool to reshape the environment to fit his own purposes. Since most of evolutionary history up till this point has involved change in the internal constitution of the organism to adapt to external change, this act constitutes a significant reversal in the relationship between the organism and the environment. And, it should be noted, it follows logically from the fall from Grace, which involved a shift from a contemplative orientation of wonder, thanks and celebration, to an active orientation that has rejected the gift of creation and has assumed total responsibility for remaking the world.

But their overwhelming success in achieving their purpose through planning and technology completely overshadows any sense of loss at this turn of events. Adam and Eve become intoxicated by their newly discovered power. This leads them to reflect on what has happened and they discovered that they have invented "rational comprehensive planning." To get what you want you need a method. First, establish an explicit, objectively defined goal. Then state all possible alternate courses of action to achieve that goal and evaluate them in terms of their possibility of use and probability of success. Next, choose the best, most efficient course of action and, once implemented, evaluate the entire process to learn how to improve performance the next time around.

Note what this newly self-conscious model of purposive action implies. Activity is seen as a means to an end, rather than an end in

itself. Any merely appreciative, contemplative and nonutilitarian encounter with the world comes to be seen as a waste of time, as useless. But what they have failed to grasp is that, if the world of leisure, play and celebration has no value (i.e. serves no purpose), then life is reduced to a world of total work and constant struggle. The only reward is success in achieving goals, and this very success reinforces the purposive orientation to life. The result is to create a deep division within the self, a division that will replicate itself and reduce the world to an arena of conflict between irreconcilable opposites: work vs. play, male vs. female, nature vs. culture, the city vs. the wilderness, good vs. bad, and on and on.

Before the fall and the related ascendance of conscious purpose and instrumental rationality to a position of exclusive dominance, Adam and Eve had lived in a harmonious world. But now there is only fragmentation, division and conflict. The divisions within Adam and Eve have been projected onto their environment. Whatever does not serve their own narrow purposes becomes an enemy, a "pest" or a "weed," or more generally, a "vengeful God." The world of *homo faber*, the world of total work, becomes a world without grace, humor, security or escape.

The tragic irony is that Adam and Eve fail to assume responsibility for these unintended "side effects" of their action. Everything that reminds them of their "sin," their rejection of their own systemic wholeness and the wholeness of the world, is seen as a curse. To escape the curse they redouble their efforts to solve the problems they have created. With the invention of the "free enterprise system" they manage to elevate selfishness, envy, and greed to the status of divine virtues, believing that the alchemy of the "invisible hand" will ultimately transmute these base impulses into the universal harmony of a new Golden Age. Rather than recognizing their error and altering the course of their blind assault on nature, they believe that they can create a world where they are no longer reminded of their loss of wisdom.

Finally, the process of dividing self and world is consummated, as Cain, the planner, innovator and technologist, kills the other half of his nature, Abel, who is the Arcadian shepherd willing to live within the bounds of what is given. The commitment to purpose is sealed in blood. There can be no turning back.

Bateson ends his version of the myth at this point but the biblical prototype describes what happens next. After Cain slays Abel, he is summoned by God, and as was true in each earlier violation of systemic wisdom, the violator is cursed. As a result, Cain becomes a homeless fugitive, desperately searching for a world beyond the reach of this vengeful God. So Cain fathers a son, Enoch, and builds the first city and names it after his son. Thus, from its beginning, the city is an attempt to create a totally artificial environment efficiently planned to meet narrowly conceived human purposes. In the city, God and the Garden are both cast out and the anthropoids begin to expand their house of mirrors, disrupting ecosystems and exploiting rural peoples in a desperate and ill-fated search to reconnect themselves to the world.

The modern industrial city and the proposal to create totally artificial worlds in space¹⁰ merely carry this theme to its logical conclusion. But it still won't work. As the story of the Garden illustrates, the lack of systemic wisdom is always punished.

Bateson's version of the biblical story illustrates a number of important points not the least of which is the fact that it is far easier to intervene in the functioning of complex ecological systems than it is to understand or regulate them. Intervention requires only purpose plus technology (piling one box on another) whereas regulation, or stewardship, requires knowledge of the systemic wisdom of nature and self-constraint in human desires. Consequently, the crisis of industrial civilization can be seen as a failure in adaptive behavior related to our unwillingness and inability to assume responsibility for that which we have the ability to change.

That is why, in many cases, we continue to have the paradoxical situation of creating great evil even when we intend to do good. Take the case, for example, of the recent attempt of the World Health Organization (WHO) to control malaria in Borneo.

The standard method for eradicating malaria is to spray DDT in order to kill the mosquito that carries the disease. Because the inland Dayak people of Borneo live in long houses with as many as 500 or more people under a single roof, the program of spraying DDT proceeded in an efficient, orderly, planned manner. The short term effect was, as expected, a rapid and dramatic improvement in the

health and vitality of the people. However, as in the story of the Garden, this intervention failed to take into account the systemic loop structure of ecological systems, a failure which led to some equally unfortunate "side effects."

Before spraying, the thatched huts of the villages provided a habitat for a small community of organisms—cats, cockroaches, and small lizards. After spraying, the DDT was absorbed by the cockroaches. They were eaten by the lizards. The cats, in turn, ate the lizards. Because the DDT became more concentrated at each level of the food chain, the lizards contained enough DDT to cause the cats to die of DDT poisoning. When the cats died, the woodland rats invaded the villages bringing with them fleas, lice and other parasites. This new community of organisms, thus, presented a new threat to public health in the form of sylvatic plague. To prevent this disease from breaking out, the RAF parachuted living cats into the isolated Dayak villages to control the rats.

While the newly arrived cats were tending to the newly created problem of the rats, another side effect of the spraying program made its appearance. It seems that the DDT had killed the parasites and predators of a small caterpillar. While the previously controlled population of caterpillars typically caused only minor damage to the thatch roofs, the caterpillars became so numerous after the spraying that the roofs of the huts collapsed.¹¹

This modern version of Bateson's story of Adam and Eve not only reinforces his point that lack of systemic wisdom is always punished, but it also illustrates the fact that, whereas modern civilization has greatly amplified its technology of purposive intervention, it has made very little progress in its understanding of the functioning of systems upon which it depends for survival.

The case of malarial control in Borneo is an example of a local intervention with relatively local effects. People in New York and Tokyo were not greatly affected one way or another. However, the activity of industrial peoples is no longer limited to single ecosystems. We are rapidly disrupting all the major ecosystems of the earth and may even be contributing to major changes in the planet's climatic system.¹² We are now caught in a vicious spiral where each intervention creates unintended "side effects," which become new problems demanding still further interventions, which create more crises, and so on. The tragedy is that each new crisis leads to the adoption of more and more expedient "solutions" in a process that moves progressively further away from systemic wisdom. In another variant of Gresham's Law, crisis management based on purposive consciousness drives out wisdom, just as "bad money drives out good."¹³

CONSCIOUS PURPOSE AND THE EVOLUTION OF CULTURE

It was stated earlier that the greatest problem facing humankind today is that industrial civilization has created a single world ecosystem that is able to function only because of its continued exploitation of increasingly scarce and inherently limited natural resources. We have also seen by both parable and anecdote, that when conscious purpose is the basis for interventions in complex ecosystems, the result is to drive God, or systemic wisdom, out of the Garden (and out of the self). It now remains to be demonstrated how cultural evolution results in a rapid loss of adaptive flexibility through overspecialization, which leads to a loss of diversity, and overcentralization, which leads to a loss of stability. These thoughts will lead us to a consideration of the kinds of corrective actions that must be taken to restore the evolutionary potential of human consciousness and human culture.

The vast number and diversity of interconnected life forms on this planet are the outcomes of an ongoing process of evolution. The individual organisms that are the result of this process are able to adapt to a wide variety of environmental conditions within the constraints set by their genetic inheritance.

The genetic diversity of a species is maintained by the constant recombination of the genetic material of individuals through reproduction, and the occasional adoption of relatively few random mutations which prove to have adaptive validity. The individual organisms which manage to survive pass on those traits which have thereby proven to be better adapted to prevailing environmental conditions. And, as new conditions arise, other types of individual organisms survive to pass on their traits to the species gene pool. In this way species remain adapted to their environments while main-

taining a potential for future changes.

Since change in biological form results in a loss of flexibility and since all evolutionary change is irreversible, the process of species change must be very slow. In biological evolution this is assured by the existence of the barrier between somatic change ("bodily change brought about during the lifetime of the individual by environmental impact or by practice") and genetic change.¹⁴ This barrier prevents overspecialization and the loss of evolutionary flexibility. According to Gregory Bateson, biological evolution, which proceeds by this Darwinian process of natural selection, is guided by a rule which says "that you should not make an irreversible change until a long time has elapsed so that it is reasonably certain that the irreversible change will pay and you won't regret the irreversibility."¹⁵

Unfortunately, cultural evolution proceeds by a process of Lamarckian rather than Darwinian evolution, (i.e. by the inheritance of acquired characteristics through the transmission of culture). Characteristics of technology, social practice and custom, education, economics, and so on, acquired by one generation are transferred to the next through learning and become "hard programmed" in the environment they create. There is no equivalent of the barrier, which exists in biological evolution, between somatic and genetic change. Bateson explains what would happen if this barrier did not exist in the rest of nature.

But let us suppose that in biological evolution there is a direct communicational bond between individual experience which will induce somatic change, as it is called, and the DNA injunctions to be passed on to the next generation. Let us imagine for the moment a Lamarckian universe, in which, if I tan myself in the sun, this will in some degree be passed on as increased brownness of the skin of my offspring. In such a system, my offspring will have *lost* a flexibility. They will no longer have my freedom. By hypothesis, I am flexible. I go brown in the sun, or I go bleach with no sun. But Lamarckian theory will in the end enforce an increasing rigidity, a loss of ability to adapt, and that won't do. Things are going to get too tight.¹⁶

This argument against the possible existence of Lamarckian evolution in nature also points up the inherent flaw of Lamarckian evolution in culture: adaptations to environmental conditions are passed on too quickly. Within a few generations of rapid innovation an entire culture can become highly specialized to the conditions which created it. Since all evolutionary specializations are irreversible, any future shift in prevailing conditions can not only make the immediate survival of the culture problematic, but can limit its ability to make further changes due to the loss of evolutionary potential.

This, of course, is a description of the dilemma facing the modern world. Philosopher Ty Cashman describes the history of industrial civilization as a case of Lamarckian evolution ending in maladaptation:

"When inheritance of acquired cultural characteristics occurs in a society where a balance has been achieved between population size, the ecosystem which supports it, and the climate, a relatively steady state can occur. What gets passed on becomes 'tradition' which stabilizes social and economic patterns. But when changes in climate, resource availability, travel, and communication between cultures are joined with an inventive spirit in the people, one innovation leads to the next and an exponential curve of change develops, rising, as such curves do, first slowly and then faster and faster. When one generation invents the steam engine, the next generation is born with it, and can improve upon it. It can apply it to different uses: ships, textile mills, locomotives. The steam locomotive in turn allows the building of large cities, which can now be supplied from long distances. A next generation, from ideas derived from working with steam power, can invent the automobile, and then the airplane, and on and on.

Western culture today is the end result of the Lamarckian inheritance pattern stimulated by the scientific paradigms growing from the Renaissance, coupled with the discovery and exploitation of fossil fuels. The result of this major adaptation of human political economy to newly available cheap combustible energy is today's global, technological-industrial economy.

... The Lamarckian evolution of the human economy seems now to be reaching the limits of its survival—for it is

specialized not only within but as a whole. It is dependent at every point on readily available fossil fuels which are now reaching depletion. The system as a whole arose from this one energy source. It is also specialized in its goal, the maximum production of goods and services in the shortest amount of time, without regard for the long-term future. And it has up till now shown an ability to function well only in the very narrow range of circumstances which allow indefinite growth: virgin lands to exploit, ever increasing markets, and indefinite supplies of metal ores, fibers, chemicals, water, and places to dump waste.

The very measure of success in achieving its goal has been the exhaustion of resources and the dislocation of the world-wide environmental support system.

There are no more virgin territories to explore and exploit; no more undeveloped regions to conquer and colonize. Even the vast seas, once teeming with fish and whales are becoming aqueous deserts. The Lamarckian technological economy has adapted so completely to the resources available 50 years ago that it has efficiently exhausted them.¹⁷

The idea of evolution has become so closely identified with the ideology of progress that this description of modern civilization as an evolutionary cul-de-sac seems to many people to be completely backwards. Haven't we evolved from a barbaric past where we lived in caves and gathered nuts and berries to a civilized present where we live in high-rise apartments in modern cities and eat food designed by science and grown and harvested by giant machines and a handful of farmers? Indeed, evolutionary theory has been evoked to give credibility to this popular myth. Just as nature began with a single cell and has evolved into a complex world-circling web of life, so human societies began as simple hunting and gathering tribes and have evolved into a single worldwide industrial civilization. Surely human civilization, like the rest of nature, has gone from the simple to the complex, the primitive to the modern. Elaborate analogies are even drawn between the specialization that has resulted from the subdivision of labor in human societies and the functional specialization of the myriad organisms that make up a climax ecosystem. Thus, rather than seeing cheap fossil fuels and energy-intensive technology as creating a maladaptive cultural form, cultural evolution itself is defined in terms of the progressive increase in per capita energy consumption. Anthropologist Leslie White has even stated "the basic law of cultural evolution" as follows:

"Other factors remaining constant, culture evolves as the amount of energy harnessed per capita per year is increased, or as the efficiency of the instrumental means of putting energy to work is increased."¹⁸

Here Professor White not only celebrates the consumption of energy as the key indicator of evolutionary advancement but also describes conscious purpose and its handmaiden technology as the driving forces behind progress. Since the United States consumes approximately 100 times as much energy per capita as a hunting and gathering society, one would deduce from the "law of cultural evolution" that we must be at least 100 times more highly evolved than our backward ancestors. In fact, this pernicious belief was acted out in our genocidal treatment of Native Americans and it continues to guide the actions of nations throughout the world as they attempt to bring the few remaining "stone age" groups into the 20th century as quickly as technology and government aid will allow. If, as has been suggested here, industrial civilization turns out to be an evolutionary dead end, we might hope that such arrogant and ill-advised efforts will at least afford us with knowledge of these remarkably well adapted groups that is useful to our own future adaptation.

In any case, since Social Darwinism is so deeply engrained in the modern mind, it might be worth the time and effort to see why our complex, interdependent, industrial civilization is inherently maladapted and may be headed for extinction due to its highly successful and rapid evolutionary specialization to conditions prevailing during the passing age of fossil fuels.

HYPER-COHERENCE

Modern society is comprised of a vast and diverse number of highly interdependent organizations and systems of organizations. But interdependence does not necessarily imply community. The recent energy "crises" have made it clear that the decisions Americans make about where to vacation and how to get to work are directly tied to the internal politics of Iran or Saudi Arabia. The

decision to grow wheat in Kansas is based as much on the weather in the Soviet Union or the production of phosphates in Morocco as it is on the health and fertility of the local topsoil. Even the decision affecting the future health of Colorado (which has 80% of U.S. oil shale deposits) is more directly tied to the escalating price and diminishing supply of crude oil in world markets than it is to the decisions made by the citizens of that state. The dependencies created within our current global village tend to foster conflictual relations among and within nations and to reduce the control any individual or group has over decisions crucial to their own survival. This mix makes the world system highly volatile and subject to almost inevitable disruption.

In the language of cybernetics and general systems theory the unhealthy interdependence of the world system can be described as a case of "hyper-coherence." Coherence is the extent to which a change in one system component produces changes in other components. In this sense any system must be considered to be somewhat coherent; otherwise it would not be a system. In a fully coherent system however, any change in one component would result in immediate and proportional changes in all other components.¹⁹ Since such a level of integration would lead to the immediate spread of disruptions everywhere in the system, it would be impossible for a living system to be fully coherent.

While it is important that an organism be highly coherent, it is disastrous for higher levels of systems such as societies and ecosystems to exhibit the same level of integration. Diversity, redundancy and systemic "incoherence," rather than strong centralized control, are essential to the stability, order and survival of larger, more inclusive systems. The global village created by high energy industrial technology is a clear example of "hyper-coherence" and maladaptive organization.²⁰

OVER-SEGREGATION AND OVER-CENTRALIZATION

The existence of a single world system creates a number of other problems. Because of long-distance transportation and cheap energy, it has been possible to achieve a level of regional specialization never before imagined. Entire states and even nations and regions have become monocultures for the production of single crops for world markets. Other areas have become company towns built around the extraction of raw materials needed to supply the voracious appetite of industry. The factory model of production has been applied to decisions affecting the character and long-term viability of entire landscapes. The result is widespread environmental degradation and the erosion of the diversity, richness, and stability of local cultures and ecosystems.

This reduction in the capacity for local self-regulation creates a situation where distant, large scale and complex organizations become increasingly involved in the management of local affairs. But this only makes matters worse, since it is impossible for higher level administrators to have information about local situations soon enough and accurate enough to make appropriate responses. And the attempt of distant authorities to regulate the details of everyday life only increases local resentment and further erodes local competencies. Such over-centralization of systems control violates W. Ross Ashby's "principle of requisite variety," which requires that the scale of authority be reduced as the complexity of action increases.²¹ Thus, the loss of local regulatory ability can never be adequately compensated by the increase in centralized control. The loss of local ecological and social stability therefore increases the instability of the total world system.²²

Thus, while it may appear on the surface that modern society has the diversity, interconnectedness and complexity characteristic of a mature and stable ecosystem, we find on closer inspection that the industrial ecosystem is a cruel caricature of natural systems. Just as Satan is a mimic of God, industrial society is an inversion of the basis for systemic health and wholeness.

And what is true of the whole is true of the part. Each individual in industrial society is a fragment, a specialized part of a maladaptive whole. Within the last generation most people in the industrial world have lost the knowledge and skill necessary to survive without the fragile and overextended network of life support systems built by cheap energy. We have lost the ability to feed, or clothe, or house, or educate, or heal ourselves in direct proportion to our growing dependence on specialists of every kind. Most of us no longer know how our basic needs are provided. Living in decaying cities and sprawling suburbs we have even lost our sense of participation in the natural

systems upon which we depend for survival. We are, indeed, "strangers in a strange land," completely dependent on forces we can neither control nor understand.

But, if a fragmented, overcentralized and overspecialized society creates individuals who are incapable of living in the world by their own knowledge and skill, it also creates the anxiety and fear necessary to ensure their continued allegiance to the very systems which render them incompetent. The service economy of post-industrial America grows fat off its failure to produce competent, whole, and self-reliant people. While centralized institutions and formal organizations become more and more complex and structured, everyday life becomes less and less orderly and sane.

By engendering such hyper-dependent and fractional individuals, industrial society becomes even more vulnerable and unstable. Should any of the complex, global systems upon which we depend for our everyday needs fail, as they must, there are no personal and local back-up systems to take their place. As Ty Cashman says, "We partake fully in the rigid Lamarckian specialization."²³

This view of social evolution leads to some sobering questions. If, as the conventional wisdom asserts, industrial civilization is the necessary outcome of culture, and if culture is the necessary expression of human conscious purpose, which is a concomitant of consciousness itself, then it may well be asked whether or not human intelligence is an evolutionary error. Perhaps given enough time, evolution in any form must lead to maladaptive overspecialization.

If we are to survive as a species we must learn how to restore the circular ecological structure of the world which our increasingly powerful technology has disrupted. This, in turn, requires the restoration of wholeness to our socio-politico-economic systems as well as to the structure of consciousness itself. Whether or not such profound changes in our thought and institutions can be accomplished in time to avoid the fate which usually accompanies the loss of evolutionary flexibility is the central question facing us today.

UNRAVELING THE PARADOX

Let us summarize the argument up to this point. We have said that the crisis of industrial civilization can be traced to the operation of human conscious purpose. But we have also said that all living systems act on and respond to only that portion of the environment which corresponds to their own capacities for perception and meets their own needs for survival. Thus, how is it that human conscious purpose has become so maladaptive? The answer, in part, is that human intelligence allows the development of language, and this mode of symbolic communication makes possible patterns of behavior uncharacteristic of other living systems. By providing abstract representations of objects and relationships and by allowing the representation and recall of past experiences and events, it becomes possible to imagine alternative descriptions of reality and to foresee (within limits) the effects of action. This means that it is possible to plan and to shape the environment to meet humanly perceived needs.

Thus, the human species is able to alter its environment rather than simply being selected by it. Moreover, it becomes possible, through culture, which is the product of language, to transmit to future generations changes in behavior that are acquired through experience. This new form of adaptation makes it possible to accelerate greatly the slow trial-and-error process of evolution which occurs through environmental selection and the differential reproduction of adaptive genetic potential.

However, even this radical innovation does not necessarily lead to maladaptation through overspecialization. For tens of thousands of years tribal bands of hunters and gatherers were able to develop patterns of belief and ways of living that were finely adapted to the ecosystems by which they were sustained. Even with emergence of horticultural societies, which created special environments of domesticated plants and animals for meeting their needs, the potentially regenerative capacities created by conscious purpose, language and culture did not become a serious problem. As we shall see shortly, there are many examples, both historical and contemporary, of human cultures living in stable, balanced, and mutually beneficial relationships with their local environments.

What, then, has allowed civilization in general and industrial civilization in particular to develop in such an anti-ecological direction? The answer, as will be recalled from the story of the Garden, can be traced to the desacralization of nature: when life is no longer seen as a gift of the "Garden," narrow human purpose becomes the

sole criteria of action. By no longer internalizing the interests of the non-human environment through an unshakeable belief in the sacredness of all creation, the regenerative potential of human purpose, amplified by planning and technology and institutionalized in culturally prescribed behavior, is unleashed, resulting in a Lamarckian evolution toward overspecialization and maladaptation.

So, it would seem that human conscious purpose is not necessarily an evolutionary mistake, only a destructive potential which must be corrected and regulated by circuits of control which serve to direct human purposefulness toward goals and actions which coincide with the needs of the larger natural systems which sustain human life. The adaptive crisis of industrial civilization is the result of the loss of these regulatory processes.

The big question, then, is, "What are these control mechanisms and how can they be recreated and sustained?" It is these questions that we must now turn.

SANCTITY, PURPOSE AND THE RECOVERY OF WISDOM

In a society in which, as Bob Dylan has noted, "Not much is really sacred," it is somewhat difficult to talk about the idea of the sacred, let alone understand the role of sanctity in constraining the regenerative potential of narrow human purpose. From our point of view it seems quite reasonable that the two anthropoids, Adam and Eve, would have developed a plan and invented a technology to get that apple. After all, if they were hungry, if the Garden had no more apples lower down to offer them as a "gift," wouldn't they have been wise to adopt a more effective strategy for survival? Indeed, for us, the appreciative, aesthetic, non-discursive and non-utilitarian attitude and the aggressive, technical, discursive and instrumental approach to life are irreconcilable opposites. The best that can be hoped is to maintain both, but in tightly segregated compartments. One mode is suitable for church or poetic reverie when one is in love, perhaps, but the other is what puts food on the table, what makes it possible for us to survive. So we kneel before God and pray in union with our neighbors in a fellowship of worship during a church service, only to run over each other in the parking lot to get home in time to catch the start of Sunday's televised presentation of ritualized conflict on the football field. It is no wonder, then, that we feel some sympathy for our poor ancestors in the Garden, who were, after all, only doing what was natural and necessary. It is God's vengeful behavior that appears a bit irrational and in need of some explanation. So, if the resolution of the paradox of conscious purpose means that we should go hungry while apples hang from the trees just beyond our reach, perhaps we should take our chances with nuclear power and space colonies and a priesthood of scientific-technological guardians.

But it is precisely this dualistic thinking, which creates such an either/or choice between aggressive intervention or contemplative appreciation, that gives rise to the paradox in the first place. To look at the problem in these terms is to fail to see the possibility of a dialectical synthesis of discipline and spontaneity, rigor and imagination, purpose and thanks. Perhaps an example would help us to see that such a harmony of opposites is at least possible. Toward that end, the poet, Gary Snyder, tells the following story about how a member of a modern "primitive" culture secures his venison:

Let me describe how a friend of mine from a Rio Grande pueblo hunts. He is twenty-seven years old. The Pueblo Indians, and I think probably most of the other Indians of the Southwest, begin their hunt, first, by purifying themselves. They take emetics, a sweat bath, and perhaps avoid their wife for a few days. They also try not to think certain thoughts. They go out hunting in an attitude of humility. They make sure that they need to hunt, that they are not hunting without necessity. Then they improvise a song while they are in the mountains. They sing aloud or hum to themselves while they are walking along. It is a song to the deer, asking the deer to be willing to die for them. They usually still-hunt, taking a place alongside a trail. The feeling is that you are not hunting the deer, the deer is coming to you; you make yourself available for the deer that will present itself to you, that has given itself to you. Then you shoot it, you cut the head off and place the head facing east. You sprinkle corn meal in front of the mouth of the deer, and you pray to the deer, asking it to forgive you for having killed it, to understand that we all need to eat, and to please make a good report to the other deer spirits that he has been treated well. One finds this way of

handling things and animals in all primitive cultures.²⁴

This Native American method of hunting need only be compared to the practice of white buffalo hunters in the last century, who slaughtered millions of those great beasts and left them to rot in the sun after removing only their tongues for a quick profit, to understand the difference between a way of life that is based on a sense of the sacred and one based on a sense of the expedient. Clearly, the "primitive" deer hunter and the "civilized" buffalo hunter are both acting with conscious purpose and they are both engaging in behavior that is intrinsically violent. The important difference lies in the attitude behind the action. The Pueblo Indian is acting out of a pervasive awareness that nature is a community to which he belongs and upon which he depends. It is not a commodity to be used, not a resource to be exploited with maximum efficiency. While violence may be sometimes required in order to exist, it should be undertaken only if absolutely necessary and, even then, only with a deep sense of regret. This combination of respect, humility and compassion for all sentient beings makes it possible to act upon the world passively, to obtain ends without use of means.

It is this way of acting that the Chinese sage Lao Tzu called *wu wei*, literally "not doing." This doctrine of inaction expresses the simple truth that force, or aggression ultimately defeats itself.

... "How does this pattern arise? It arises out of the inertia of existence, the tendency of every existing object or arrangement to continue to be what it is. Interfere with its existence and it resists, as a stone resists crushing. If it is a living thing it resists actively, as a wasp being crushed will sting. But the kind of resistance offered by living creatures is unique: it grows stronger as interference grows stronger up to the point that the creature's capacity for resistance is destroyed. Evolution might be thought of as a march towards ever more highly articulated and effective capacity for resistance. Humans and human societies are then highly responsive to challenge. So when anyone, ruler or subject, tries to act upon humans individually or collectively, *the ultimate result is the opposite of what he is aiming at*. He has invoked what we might call the Law of Aggression." (emphasis mine)²⁵

The deep wisdom of the Pueblo hunt is that the deer is considered to be a "person" with its own destiny and role in creation and it is understood that the relations between the human people and deer people are subject to this Law of Aggression. Thus, it becomes important to communicate to the spirit of the deer that the hunt is necessary, that it is not undertaken merely as a violent, bloodthirsty act. Whether or not there is a spirit of the deer to accept this explanation is, in one sense, not important. The attitude itself is sufficient to ensure that the carrying capacity of the land is not diminished by wanton destruction. By treating the deer as sacred, the Pueblo are able to control the regenerative potential of human greed and violence and to regulate effectively the complex ecosystems of which they are a part, while meeting their own legitimate needs for survival. The culture of the buffalo hunters, which has failed to respect the sanctity of the world, is now playing out the Law of Aggression on a global scale. Unlike the Pueblo culture, we have yet to understand the paradoxical wisdom of the Tao Te Ching:

Heaven is eternal, the Earth everlasting.

How come they to be so? It is because they do not foster their own lives.

That is why they live so long.

Therefore, the Sage

Puts himself in the background; but is always to the fore

Remains outside; but is always there.

Is it not just because he does not strive for any personal ends

That all his personal ends are fulfilled?²⁶

One can imagine Adam and Eve puzzling over such irrational and impractical advice. But, it will be remembered, it was they who cast out from the Garden the concept of their own systemic wisdom and its systemic wisdom and, in the act of doing so, created a world of mere things, a vengeful God, and a life of toil and suffering. Before moving on, let us take one more look at the Garden before the fall, before cultural evolution got caught up in the vicious cycles of the Law of Aggression.

Animism, the attribution of divine character, or "personhood," to natural objects and ecological systems, seems to be an important reason why traditional cultures are able to maintain a non-

exploitative and stable relationship with their surroundings. Anthropologist Roy Rappaport, whose exhaustive field work and brilliant theoretical formulations have firmly established the causal relations between sanctity, ecology, purpose, and human adaptation, provides a summary of the conditions necessary for a symbiosis between nature and culture in the following analysis of forest horticulture, an association of completely autonomous groups ranging in size from 150 to 900, who live in the mountains of Australian New Guinea:

"We may reflect here on the general strategy of slash and burn forest horticulture. It is to establish temporary associations of plants directly useful to man on sites from which forest is removed and to encourage the return of forests to those sites after the plants have been harvested. The return of forest makes it possible, or at least much easier, to establish again an association of cultivated plants sometime in the future. The Maring recognize this, of course, and are almost as solicitous of the trees growing in their gardens as they are of cultivated plants. Their appreciation of the regenerating forest is clearly reflected in their term for it: *nduk mi*, which means "mother of the garden."

It is clear that the Maring nurture not only the garden species that provide them with food directly, but also those species upon which they indirectly, but nevertheless ultimately, depend: the forest species that make it possible for the garden species to flourish from time to time.

Effective ecological regulation, which is to say the maintenance of the circular structure of ecosystems, depends in systems dominated by men on effective information feedback from the environment to those operating upon it (the flow of information through ecosystems, like the flow of materials through the same systems, must be circular). Information feedback from the environment is sensitive and rapid in small autonomous ecological systems in which everyone is a gardener. There are no special interest groups in the societies participating in such autonomous local systems. It is clear to *all* men living in such systems that their survival is contingent upon the *maintenance*, rather than the mere *exploitation* of the larger community of which they *know* themselves to be only parts. They comprehend more clearly than hunters and gatherers and more clearly than modern men the circular structure of their world, and they are likely to understand well that their own purposes or goals are limited by that structure and the need to maintain it.²⁷

ECOCOMMUNITIES: TOWARD A NEW SYNTHESIS OF NATURE, SELF AND SOCIETY

We are now in a position to describe the necessary and sufficient means by which it is possible to transcend the paradox of conscious purpose and, by doing so, to create a society which, through its emulation of naturally occurring ecosystems and the evolutionary processes by which they are created, can ensure the maintenance of evolutionary flexibility and adaptive potential. This synthesis rests on two related ideas, sanctity and community. These two themes come together in the idea of ecocommunities, associations of plants, animals, microbes and people living together within the seasonal cycles of sun, wind and water that provide the energy flows and nutrient recycling necessary to maintain life. Central to the concept of ecocommunities in the principle of symbiosis, the living together of diverse species in mutually beneficial relations. The ecocommunity, as symbol and strategy, is the basic building block for the creation of a new form of human culture that joins modern science and technology with the sacred worldview of archaic and mystical traditions in a new synthesis of nature, self and society.

Let us take a closer look at the part played by the themes of sanctity and community in this synthesis.

Sanctity

We have seen through Bateson's story of Adam and Eve that human conscious purpose becomes a problem as a result of the epistemological error of setting up an inaccurate distinction between self and environment. By no longer perceiving the mutually interdependent system of self-in-the-environment as a systemic whole, human purpose comes to be seen as separate from and in conflict with the needs of the larger system of which it is a part. A paradox is a seemingly contradictory statement that results from the un-

conscious existence of a false premise. Once such a premise is recognized as an error, the paradox dissolves in a higher synthesis. The paradox of conscious purpose is the result of the false dualism that its "us" against the "environment." Once this is realized it becomes clear that true human purpose, even in a strictly narrow utilitarian sense, is identical with the needs of the larger systems of which we are a part. While it is not possible to avoid making distinctions in the phenomenal world, where everything is defined by its opposite, it is essential that the distinctions we make have adaptive value. Clearly, the dualistic epistemology of Western technological culture fails by this criteria.

The crisis of industrial civilization leads to a paradox, i.e., in order to survive we must continue to consume the resources necessary to survive. Thus, like a *reductio ad absurdum* proof in geometry, the assumption that self and environment are not one leads to a logical absurdity. Bad epistemology has no survival value. We shall never escape the fate we have created for ourselves unless we radically change our root assumptions about the nature of reality.

Through the example of the Pueblo deer hunt and the Maring slash and burn forest horticulture we have seen that the conception of natural objects and systems as deified persons is one way of ensuring that human purpose coincides with the needs of more inclusive systems. It is suggested, therefore, that such an "animistic" worldview is a more accurate description of reality than our own rational, "scientific" worldview.

In dealing with complex systems which we can never, in principle, fully understand, it is essential that our action be based on a basic respect for the sanctity of those systems and an awareness of our own participation in and dependence on them. As Roy Rappaport has said, "Knowledge will never replace respect in Man's dealings with ecological systems."²⁸ Because we now act on the assumption that we do adequately understand the complex interactive loop structure of natural systems, even our attempts to do good, as in the case of the malaria control program in Borneo, result in great harm to our environment and ourselves. But this paradox is the result of action which does not respect the Law of Aggression. By showing us how to act without acting, to obtain ends without means, the Pueblo Indian hunter and the Maring horticulturalist point us toward a mode of being in the world that is fundamentally non-violent and ultimately more effective. Unless we achieve a similar consciousness and embody it in our institutions and technologies, we shall continue to achieve the opposite of what we intend. At its root, an appropriate technology and culture must grow out of and express an appropriate epistemology. This, in turn, may well depend on the restoration of the sacred to our metaphysics.

Not only does sanctity ensure that a balance will be maintained between a human group and its environment, but it also prevents the vicious cycle of exponential runaway that we have referred to as Lamarckian evolution. It is the functional equivalent in cultural evolution of the Weissmanian barrier between somatic change and genetic change in organic evolution. Since genetic change in species form reduces long term adaptive flexibility, and since all evolutionary change is irreversible, natural selection, to be successful, must be conservative. Through the ability to transmit directly patterns of behavior and environment from one generation to the next, cultural evolution, in the short run, is no longer bound by the selective mechanisms of the natural environment. In effect we select the environments by which we are selected. Every cultural change creates the conditions which make further change in the same direction more probable. To ensure that the direction we are headed is the direction we want to go, we must make sure that the process is slow enough for us to see where we have been. For this to happen, innovation must be relatively infrequent and localized, and the criteria for the selection of changes to be introduced must, at a minimum, be grounded in a concern for the long-term viability of the systems we intend to change. Our power to be greedy and unwise requires that we develop the wisdom necessary to control that power.

In planning it must be recognized that the outcome of our actions will never be completely or accurately predicted. Thus, sanctity, that "quality of unquestionable truthfulness imputed by the faithful to unverifiable propositions,"²⁹ must be a necessary part of any effective strategy for making adaptive evolutionary change. It is as essential as the "necessary truth of logic and the empirical truth of experience" in the shaping of human behavior.³⁰ Sanctity regulates our relations with ecosystems in a way which ensures their (and our)

long term sustainability:

"In general terms, then, through sanctification the purposes of the higher order systems may be injected into lower order systems. As such, sanctification operates as a counterthrust to attempts on the part of subsystems which are also social groups to promote their own purposes to positions of dominance in higher level systems. In slightly different terms, sanctity helps to keep subsystems in their places."³¹

If sanctity is a necessary ingredient in any viable culture, community is the means by which sanctity is operationalized and transmitted to future generations. Each concept implies the other. Let us take a closer look at the idea of community and the nature of this relationship.

Community

Largely because of cheap fossil fuels and large-scale centralized technology, we no longer live within community. We live as individuals within a mass superficially connected to one another through interest groups, temporary coalitions and whatever shared consciousness is created by the banal fare of soap operas, sitcoms, newscasts, and sports circuses offered by the broadcast media.

This is a poor substitute for the deep and rich quality of human relationships fostered by small face-to-face communities of shared space, personal responsibility and mutual obligation. We also no longer live within the limits of local ecosystems but, rather, depend upon the extraction of resources from every corner of the earth to meet our most basic needs. The idea of ecocommunities is to reintegrate these parts of our lives that have become so fragmented and dissociated in time and space.

The principle of sanctity leads to an attitude of respect for wildness, for the recognition of the fact that human life is totally dependent on the "useless" beings and processes that comprise the globally interdependent network of naturally occurring ecosystems. This respect for the sanctity of all creation must be embodied in the social, political, and technological systems by which we interact with the living world. This wholistic vision of a climax ecosystem of culture-in-nature is expressed by Gary Snyder's notion of a democracy of all sentient beings and things:

"In Pueblo societies a kind ultimate democracy is practiced. Plants and animals are also people, and, through certain rituals and dances, are given a place and a voice in the political discussion of the humans. They are "represented." "Power to all the people" must be the slogan."³²

Without sanctity such a community could not exist, but without the institutionalization of this world view in the rituals and enactments of everyday life, the idea of the sacred could not exist. Together, sanctity and community create a self-organizing, self-regulating and self-repairing system, a cybernetics of wholeness and balance through a harmony of opposites.

David Spangler, a leading spokesman for the idea of the new age and an active participant in the creation of new age communities, provides a definitive summary of the emerging synthesis of scientific perspectives in the fields of ecology, quantum physics, cybernetics and communication arts, and the essentially mystical idea that humanity is entering a new era of spiritual growth, cultural transformation and evolutionary advance:

... Like the idea of symbiosis, the essential image of the new age is of a state of wholeness, interrelationship and interdependency, all qualities that may also define community. In fact, in the new age vision, the universe itself may be perceived as a community, co-created by all the forms of life that inhabit it (remembering that even matter is considered to have a living, spiritual aspect and therefore is a participant in this co-creation). The proper way of relating to the world about us—to the forces of nature, to stones, plants, and animals, as well as to each other—is in terms of community: everything we see is a fellow member, a co-participant, in this community, with all of us being linked together by subtle bonds of spiritual communion and communication. The effect of this is to elevate the meaning of community from being simply a place for collective habitation and enterprise to being a relocation of our deepest nature and the deepest nature of creation. Community transcends its social aspects and becomes an educational enterprise, a "yoga of relationship" that can offer a path to union with the universal wholeness. It becomes a strategy for experiencing holistic con-

consciousness at work and may even be defined in terms of that consciousness, becoming an inner state of being as much as an outer place or gathering. Thus, community may come to mean not so much the act or result of living and working together but rather the state of consciousness which, reflecting the essential wholeness of life, can actively manifest wholeness in human and environmental relationships.

Furthermore, community may be defined as a multi leveled or multi stage activity. First, there is the community of my own being, my own internal wholeness which potentially exists between the parts of my body, my emotions, my thoughts and my spirit . . . and my objective is to nourish its emergence and find inner balance and harmony . . .

The second level is the community of my fellow humans. Here I seek to establish wholeness and communication with loved ones, friends, co-workers, and others. Human society would not be possible without activity on this level. However, this level and the first one are symbiotically related: since I do not exist in a vacuum, my relationships help to define and inspire inner states, and my inner condition of wholeness and harmony reflects directly into my relationships and my ability to function in community with others. Both these levels of community influence each other. In the idea of the symbiotic or new age community, this mutual influence or exchange is beneficial; one level of community helps to co-create the other.

Third, there is the level of the ecology, the community of lives that make up the natural world and of which humanity is a part, though it often seems forgetful of that fact. The ecology of our world is a tightly knit community of interdependent and interbalancing relationships. Human community and human individuality need to act in harmony with these relationships, forming the greater community of life on earth. Our evolution is intimately tied into this community, and we, in turn, can affect, for better or for worse, the growth and development of the biosphere.

Fourth, there is the earth itself. For thousands of years, most of the great spiritual paths and teachings of our species have acknowledged our planet as a being, a living consciousness several magnitudes removed from our own. In analogy to ourselves, earth can be seen either as a great Individuality, participating in the larger community of the cosmos, or as a community itself, composed of all the parts (like ourselves) that make up its internal wholeness.

All these levels of community are seen, in the vision underlying the idea of a new age, as interactive and symbiotic, each contributing to the other, each demanding the creative participation of the other . . .

. . . It is through our successfully embodying the spirit of community in ourselves and in our relationships that we contribute to the on-going unfoldment of our world. Community, then, becomes a direct strategy in the process of the evolution of consciousness, a way of releasing from all levels of life and being new potentials of expression and vision.

This definition of community verges towards the mystical and makes the practice of living and working together a sacred act.³³

This definition of community as a "yoga of relationships" by which the world is continually created is not only aesthetically pleasing and intuitively "right," but it is also remarkably similar to our emerging ecological understanding of the organization of the natural world. Unlike the global industrial ecosystem, which is structured along the lines of a machine in which each subunit is a fragment of the larger whole, completely unable to function alone, the living world is, like David Spangler's idea of community, composed of worlds within worlds in which each subunit is itself a whole system (or community). The health of the whole depends on the health of each part and the health of each part depends upon the health of the whole. This way, notes biologist John Todd,

opposite tendencies are fused by nature. For example, a cell is capable of carrying out all the functions normally attributed to life, and, as such, is a mirror image or reflection of higher levels of organization. It predicts the organism of which it is a component . . . and while the organism of which it is a part is dependent upon nutrients, energy and support from other organisms, it is at the same time capable of functioning as a complete entity.

In nature a continuity exists in which the smallest living element is an image of each level of organization. A unicellular organism is structured and operates in much the same way as a complex organism such as a tree or a higher animal which, in turn, has much in common with the ecosystems that sustain organisms. The same kinds of process and principles of design extend from the organelle to the biosphere.³⁴

So the idea of ecocommunities, rather than being a romanticized nostalgia for our preindustrial past, turns out to be an expression of the wisdom of organic evolution as well as a strategy for the recovery of the wholeness we have lost in our mad rush to industrialize the earth.

ECOCOMMUNITIES AND HUMAN ECOLOGY

The idea of ecocommunities is a symbol of wholeness, an ideal type, that, in principle, is capable of restoring to consciousness and culture a sense of the circular structure of the world. As a concept, it can apply at every scale of environment, from an individual household to the neighborhood, city, region, nation, or the entire planet. Just as the living world is composed of whole subunits joined by mutually beneficial associations into increasingly organized, complex, diverse and stable wholes in a co-creative, interdependent web of life, a human ecology based on this concept of ecocommunities would be characterized by wholeness (internal coherence) at every level of organization. This would tend to reduce the problems of hyper-coherence, overcentralization and oversegregation characteristic of modern industrial civilization. By de-coupling local systems from the more inclusive global system, it would become possible to obtain a better match between lines of authority and levels of action. Like the Maring horticulturists, feedback about the effects of interventions on ecosystems would be accessible to those making the interventions. In such an arrangement it would be much less likely that farmers in Kansas, for example, would be driven to deplete soils and ground water in order to make enough money to buy food and other essentials (e.g. fertilizers and pesticides) and to retire their debts on expensive farm machinery. Basic survival needs would be met from the non-monetary household economy of a healthy, diverse and balanced farm. If long-term sustainability were to replace short-term expediency as a precondition for survival, ecologically derived practices would once again become common sense. The costs and benefits of interventions in ecosystems would be directly perceptible and the corrective actions necessary to restore order would tend to become direct, immediate, and effective.

Industrial societies, like individual organisms, achieve overall system control by the progressive centralization of regulatory functions in increasingly large and complex administrative bureaucracies. But, as we have seen, this means of ensuring coherence doesn't work. In a society organized according to the principles embodied in the idea of ecocommunities (i.e. locally self-reliant, personal and socioeconomic wholes), it would still be necessary to ensure some level of overall system coherence. If, as has been suggested, human ecology should emulate in its functioning and evolution the principles which underlie the operation of other living systems in nature, it would seem that social control should be similar to the basis of orderliness in ecosystems. Rather than relying on centralized regulation, a climax ecosystem achieves stability and adaptive resilience through diversity, redundancy, symbiosis, metabolic efficiency, nutrient and resource recycling, and the efficient utilization of the available flows of solar energy. A global federation of relatively small-scale, self-reliant ecocommunities, operating on the renewable energy flows of sun, wind, and water and integrated into ecologically and socially stable bioregional economies would make such a social ecology possible. While there would still be a great deal of interdependence, each community, city and region would be socially, culturally, and technologically distinct, reflecting a geographically and historically unique synthesis. Since local survival would be based on the maintenance of local flows of energy, matter, and money, economic relations between and among subunits would be based on choice, not necessity. By thus reducing the current unhealthy levels of compulsory dependence which characterize the present world system, the stability of the whole would increase—without the need for a strong, centralized world government. By thus increasing the coherence, or level of integration, of subsystems it would become possible to decrease the coherence of more inclusive systems.

Moreover, the cultural and biological diversity generated by such an organization of human society would increase redundancy,

and therefore stability, and would enlarge the "genetic" stock of social, political, technological and cultural forms. Thus, long-term as well as short-term adaptive flexibility of human culture would be maintained. Since the future behavior of the earth's more inclusive system, such as the climate, is not predictable, the maintenance of such flexibility is sure to have importance in the continued evolution of consciousness and culture. And, as has been argued, the operation of the principles of sanctity and community in such a global system would tend to ensure that evolutionarily irreversible changes in human culture occur only when their immediate adaptive value has been proven.

In conclusion, a world organized according to the values and operating principles embodied in the idea of ecocommunities would, by making human conscious purpose coincide with the needs of more inclusive systems, restore to the process of cultural evolution the balance of innovation and conservation necessary for systemic health and orderly development.

ECOLOGICAL SCARCITY AND THE TRANSFORMATION OF INDUSTRIAL CIVILIZATION

Having outlined the nature of the problem and the nature of the solution, the next obvious question is, "How can we get from here to there?" As might be expected, this presents us with another set of paradoxes. It has been argued that evolutionary change must be slow to guarantee that long-term adaptive flexibility is not lost through overspecialization. Yet, because of the Lamarckian overspecialization of industrial civilization to non-renewable resources which are rapidly being depleted, it has become vitally necessary to our short-term adaptation (and, perhaps, long-term survival) that the most change-resistant social form ever devised be transformed more rapidly than any civilization in history. Moreover, to be successful, change at every level must be integrated and coordinated, since we no longer have the energy or capital necessary for ad hoc change and contradictory policy development. This would seem to require even more expedient, narrow and centralized planning to ensure that we do not run out of the time and resources necessary to reorder the entire global economy. But, if this is the case, the principle of local decision-making and control would seem to be a luxury we can no longer afford. Thus, when we move from idea to reality it would seem that the paradox of conscious purpose returns in an even more virulent and form, since even its theoretical resolution has become practically impossible.

But if the arguments developed in this paper have been at all persuasive, it should be clear that the tendency to want to turn over global crisis management to a multidisciplinary scientific-technological elite must be resisted, not only because it is morally repugnant, but because, ultimately, it won't work. The solution to this dilemma, like the dilemma itself, must be paradoxical. Planning, which has created the problem, won't solve the problem, yet the problem can't be solved without more planning. The key to the resolution of this paradox lies in the issue of scale and in the recognition of the fact that, as stated in the Law of Aggression, every force organizes its own resistance. If industrial civilization has created a crisis of adaptation, it can be expected that it has also organized the counterforces necessary for its resolution. In fact, this law of opposites can be seen to be operating through the emergence of the phenomenon of ecological scarcity (34), which is making it impossible for industrial civilization to continue long in its present form. Thus, the stage is set for a reversal of trends which have dominated the past five hundred years of cultural development.

Since, in all such dialectical processes of change, the synthesis is an emergent property of the total historically defined context, it is impossible to predict the ultimate outcome of this process. However, a major change in the direction of cultural evolution can be expected, and the spontaneously emerging corrective forces which will bring it about can be recognized and nurtured as they emerge. Thus, an understanding of the cybernetics of evolutionary change can lead to the development of a more appropriate and effective theory of action for social change. Rappaport explains:

... corrective, or potentially corrective forces emerge through unplanned evolutionary processes, and ... theories of action should be predicated upon the existence and continued generation of such forces. Indeed, if such a theory is to avoid the dangers attendant upon meddling in the regulation of highly complex and poorly understood systems, it should focus upon

spontaneously emerging corrective forces and upon their nurturance. No clear line can or need be drawn between planned intervention on the one hand and the nurturance of such spontaneous forces on the other, but emphasis in a theory of action should be on the latter. Such a theory of action should aim toward defining actions which encourage the development of regulatory mechanisms as a class, rather than attempting to specify the corrective actions to be undertaken in various circumstances.³⁵

The concept of ecocommunities elaborated in this essay provides a set of criteria useful in assessing whether or not action is moving in the right direction. Since the global human ecology is too complex and poorly understood to allow its transformation to be planned from the top down by more inclusive systems, it must be changed through a process of planned interventions at the local level. While such a grass-roots movement for personal, social, technical, political, and cultural change will involve far more planning than exists at present, the kind of society this process will create could never be planned.

The success of this revolution in consciousness and culture depends on nurturing its roots. Only if we are successful in creating a society of ecocommunities will we be able to discover how to maintain a viable world community. Like the development of an organism or an ecosystem the whole system must be an expression of the unfolding interaction of its parts and guided by an image of the whole toward which action is headed.

While it is not possible to foresee what will happen or to predict whether or not the actions of myriad numbers of small scale, local groups will be able to effect such a profound transformation of industrial civilization, one thing is certain—the future will not be boring. Nor will it be painless. And every day that passes without significant and widespread change increases the possibility that such "corrective action" will be too little and too late. I suspect that, during the last quarter of this century, we shall come to experience the true value of what we lost when we cast out from the Garden the concept of the systemic wholeness of nature, self and society. In the words of William Blake we shall soon discover the price of wisdom:

What is the price of experience do men buy it for a song
Or wisdom for a dance in the street? No it is bought with the price
Of all that a man hath his house his wife his children
Wisdom is sold in the desolate market where none come to buy
And in the withered field where the farmer plows for bread in vain.³⁶

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