

TOWARD A NEW CONCEPT OF GLOBAL MORALITY

by *Solomon H. Katz*

Abstract. The human community faces today the most serious challenges ever to have confronted the planet in the areas of health, environment, and security. Science and technology are essential for responding to these challenges. More is needed, however, because science is not equipped to deal adequately with the values dimensions and the political issues that accompany the challenges. For an adequate response, there must be cooperative effort by scientists and statespersons, informed for moral leadership by the religious wisdom that is available. The religious communities can provide this spiritual dimension, thereby fulfilling their traditional role, but it will require their coming to terms with the character of the scientific and technological base of contemporary culture. The paper lays the conceptual groundwork for understanding these issues.

Keywords: anthropology; biocultural evolution; global morality; moral leadership; religion; science.

It was the late 1970s, and the threat of nuclear war and holocaust was so very real that it tended to overshadow such vital issues as environmental pollution, famine, and disease. In the midst of this threat a small group of us (scientists, theologians, and philosophers) met to discuss what we could contribute. The real issue, it seemed to us, was to bring to bear a holistic scientific approach to the challenges that faced us. It was a “value free” science that had enabled the technologies which fueled problems.

It seems evident that, given the resources and the will, modern science and technology can provide fundamental understanding of some of the most vexing problems confronting us. However, it is also clear that more technology is not always the answer and, furthermore, that one technology will always overcome another, leading to a continuous escalation of

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technologies. There is a need for a new kind of moral leadership that links the scientists and statespersons to work in sufficient harmony to overcome the problems. However, this new kind of leadership will not come without a basic moral strength stemming directly from a religious and spiritual wisdom that directly addresses the old problems of cooperation and conflict in the world.

This paper attempts to lay a conceptual foundation by describing the new moral leadership that I call for and the resources on which it must build. The first half presents a macroperspective on human evolution, introducing the concept of biocultural evolution as a newly emerging scientific paradigm that provides basic insights into human nature and evolution that are relevant to the challenges that face us. The second half employs biocultural evolutionary theory to present a model of the role of religion in cooperation and aggression. The model sees religion as a catalyst to promote cooperation and facilitate the emergence of the new moral leadership in the scientific, technological, and political spheres.

THE CONTEMPORARY WORLD IN THE MACROPERSPECTIVE OF ANTHROPOLOGY

An anthropological approach to the human condition provides us with a wealth of perspectives. First, it allows our dimensions of time and human diversity to be expanded. This perspective provides us with knowledge about where we have come from, how we came to be here, who we are, and what has happened to us as we have expanded over the entire planet. Anthropology gives us a perspective on the past and an understanding of the present, but it can provide only an educated glimpse of the future. A science of humanity is only as valid and reliable as the trajectory that it has traced from the past to the present. The science of humanity that exists today is rapidly expanding into the realms of human experience and human nature never previously explored. We as human scientists are reaching out and encountering the human spirit in ways that stretch the bounds of what is today considered science. In so doing we are delving into some of the most significant, complicated, exciting, and frightening new problems, prospects, and dilemmas facing our contemporary world in much the same way as the spiritual leadership of our world has traditionally done in the past.

To begin this process of stretching the limits we take a brief anthropological odyssey, in which we will step back from a micro view of the contemporary world that is measured in hours, days, and years and adopt instead a macro view that observes trends and events of our species as a whole.

I seek to define some of the most complicated contemporary problems facing us in the realms of health, environment, and security. These are

domains in which spiritual leadership and religious thought have traditionally made substantial contributions.

Many of the modern problems of humanity can be summarized under the headings of human health and illness; demographic problems of fertility, mortality, and migration; problems of cooperation and aggression; and problems of environmental degradation. In each of these cases new technologies have accelerated the rates of change in the solutions of old problems and the creation of new ones. More important, however, the problems of modern humanity seem to have gotten completely out of hand, requiring such vast sacrifice and wisdom that their solution seems almost impossible. The global problems of ozone depletion, excess carbon dioxide production, denuded tropical rain forests, acid rain destruction of the temperate forests, river damming and pollution, sea pollution, topsoil depletion, general failure of human health, and the precarious nature of agricultural production from new cultivars highly dependent on irrigation, fertilization, insecticide use, and genetically engineered alterations—all coupled with an uncontrolled growth of human population and desire for material goods—make it extraordinarily unlikely that we will survive these massive trends without global environmental catastrophes, terrible conflict and warfare over increasingly scarce resources, or tremendous material sacrifice. If this set of enormous challenges is coupled with our increasing ability to alter the human genome and the entire process of the human life cycle at the individual level, then the two problems could be linked for purposes of control which could vastly restrict and/or restructure the future of humanity. Our goal is to anticipate these possibilities, develop real and understandable models of the future, and begin to plan in a socially and politically acceptable and realistic way for probable eventualities that will be confronting us in the years to come.

WORLD PROSPECTS AT THE END OF THE TWENTIETH CENTURY. If we stand back and examine the emerging world problems for the next decade and beyond from the perspective of time, space, and our human roots, a remarkably consistent pattern emerges. We are strained by the rapid decline in world resources which is being countered by a rapidly developing technologically driven series of solutions to problems never before encountered by any species or civilization of the past. Global communication, as exemplified through the exponential growth of the Internet, and travel shorten the distances between populations, and information processing of all kinds is allowing greater access to the issues and to possible solutions to local problems. As the superpowers of the 1980s have increasingly realized in the 1990s, there is a rapid shift occurring with the economies of warfare. The older tendency for the overproduction of arms for almost fifty years following World War II has led only to decreased productivity in other sectors of their own economies and to increased

instability among those to whom the armaments have been transferred. Thus, as the potential for solving the immediate problems of survival has continued more or less to keep pace with the enormous growth of the world population size, the world community has not paid sufficient attention to the longer-range problems that may result from these short-term and limited-range strategies.

There is a growing realization that consumption of all kinds is going to have to be reduced to balance population growth, and environmental degradation, along with this reduction, is going to call for sacrifices both by those who have a high material standard and by those who do not. Given the unthinkable and increasingly rejected implications of world and regional warfare, we have to turn our attention to the religious institutions as the most traditional reservoirs of the kind of values we will need to survive in the future. It will be up to religious wisdom to lead us to understand, for example, that poverty is not only a state of material deprivation but, even more, a deprivation of spirit. We must learn and put into practice effective ways of modifying materialistic values that are characterized by behaviors of high consumption, ownership of the natural world, and disrespect for the shared environment, and replace them with whole new kinds of value systems that minimize our impact and optimize our sense of spirituality through connectedness and community.

While it is important to call for new and reinvigorated religious and spiritual leadership, we cannot be blind to the fact that none of these developments, positive or negative, has the potential power of misdirected religious and religious-like ideology that continues to foment warfare and persecution of all kinds. Around the world, religious and ideological warfare still give rise to life-threatening and -taking behaviors. Unprecedented holocausts have occurred during our lifetimes, and our religious traditions either stood by passively or, worse, helped to light the fires of hatred.

In the broader sense all of humanity is caught between the need for a well-winnowed powerful religious/ideological means of motivating strong positive action within our world and the power this has for producing the kind of negative action that produces chaos and hatred when differing religious, ethnic and racial groups confront one another. This issue stimulated me to investigate the role of religion in processes of cooperation and conflict. In order to approach this problem I have attempted to use a new biocultural evolutionary paradigm and to trace the prehistoric roots of this process through human history.

THE EVOLUTIONARY HISTORY OF HUMANITY. In order to provide insights on the future status of humanity and as introductory material to the other sections of this paper, I have attempted to summarize very briefly three major ways of evaluating the evolutionary history of *Homo sapiens*. They are: (1) An examination of the physical and behavioral evidence of

evolution; (2) A theoretical exploration of biocultural evolution; and (3) The use of population size as the best means of gaining insight on our current evolutionary status.

1. *The Physical and Behavioral Evidence.* The macro history of our species is best documented in terms of what we have been able to reconstruct about the evolution of our genus and species, *Homo sapiens*, from the beginnings of our genus about 2.5–3.0 million years ago. Upright posture appeared very early in this process, and standing tended to free the hands for more complicated behaviors related to the production and use of simple but efficient tools. The more these tools helped their bearers adjust more effectively to their environment, the more important tools became to the success of these early ancestors.

Larger and more complicated brains probably resulted from this successful tool-using and -making strategy. However, larger and more complicated brains also put a strain on the gestational process. Upright posture limits the size of the birth canal because of the mechanics of walking. Larger brain size at birth would be a disadvantage if the birth canal were too small to allow the head of the newborn to pass through. However, if babies were born with a less developed brain that would go on developing outside the mother's body, then the trend toward large brain size could still continue. This explanation appears to fit the data very well; humans are born in a very immature state. Such immaturity demands a great deal of parental care, and there is a very rapid growth of the brain following birth. Human infants are more helpless at birth and require more care than if they were to be born with a more developed central nervous system (CNS), as is the case with most other mammals and primates.

This immaturity also allows for a greater effect of environment on the capacity of humans to learn and develop their own behavior patterns which are highly dependent on the parental caretakers. As culturally learned behaviors become an essential part of the population's potential for survival, there is an increased advantage for the well developed capacities of the central nervous system to learn more fundamental behaviors before reaching the capacity to reproduce that comes with sexual maturity. If behavioral advantages accrue to the survival of the next generation, then such capacities as an extended period of growth and development become selectively advantageous. Thus, humans have a longer period of growth and development and require more parenting than any other primate.

This extended period of growth and development also means that the early loss of parents could likely lead to the premature death of the offspring. Hence, unlike other primates that lack significant post-reproductive longevity, *Homo sapiens* accrues advantage from remaining alive long enough to ensure that their offspring become reproductively successful members of the next generation. This trend gives rise to the other unique

aspect of the human life cycle, the very long period of post-reproductive longevity which is so clearly present among females. This capacity for longevity was reinforced by the coevolving capacity for speech and more sophisticated abstractions for communication of information that was vital to the survival of the group or population. This coevolutionary process of language and longevity provided another critical development in the adaptability of the species.

2. *The Biocultural Evolutionary Paradigm.* There is another way to understand these evolutionary processes. This has come from a growing series of insights that there is a direct evolutionary relationship between the sociocultural dimension of human life and the biological dimension. Whereas the changes in the biological system follow an evolutionary direction constrained by the operation of genes, the cultural system follows a system dependent on the structure and function of the human brain. Although the human brain and higher-functioning cerebral cortices (CNS) are dependent on the same genetic constraints, it has evolved to be an open system capable of assimilating vast amounts of information during the lifetime of the individual. If this information alters the individual's behavior successfully, then any genetic complement the individual passes to the offspring of the next generation will also share those CNS characteristics that underlie the successful way the information was collected, processed, and stored. In this way behavior has an enormous impact on the success of the species. Since successful behaviors are largely the products of the effective functioning of the central nervous system (CNS), they are highly effective in selecting for those aspects of the CNS that enable the expression of the successful behaviors.

Particularly important in this process are the higher cortical processes that have recently evolved to facilitate these functions. Because the genetic system is based on the evolution of informational macromolecules and the central nervous system also processes information, we can begin to look at the evolution of the sociocultural dimension as an information system that supplements and complements the biological information system resident in the DNA of the species. Thus as the evolution of humanity proceeded, it slowly decreased its dependence on the biological evolutionary capacity (with the exception of the CNS) and became increasingly dependent on the complementary and supplementary functions of the CNS-dependent sociocultural information system. As the continuity of the information in the sociocultural system improved through improved social communication, memory and recall, the effects of this more rapid and powerful means of responding and adjusting to environmental needs became more important than the biological (genetic) means of adapting. However, the sociocultural information system is much less stable than the genetic information system, since it is principally dependent on the transfer of information

from one generation to the next through learning and therefore often requires tremendous social stability and substantial redundancy and reinforcement to work well.

In summary, there is increasing acceptance of the hypothesis that there is a reciprocal feedback process between human biology and behavior in which biological needs, cultural responses, and environmental resources tend to reach a dynamic equilibrium over time. We have defined this process of change as *biocultural evolution*. More specifically, biocultural evolution can be further summarized as consisting of a set of essential interactions including (1) the biological information system, that is, the DNA of a particular human population which interacts through its phenotypes; (2) the cultural information that is the sum of the knowledge and experience a particular society has accumulated, which interacts through exchange among its members; and (3) the CNS, which is itself a biologically based information system whose principal evolved function in this model is to facilitate the acquisition, storage, processing, and communication of individually and socially developed knowledge and awareness.

The basis of the heuristic biocultural evolutionary approach underlying this paper is that in every human population there is a time-dependent dynamic equilibrium among ecological, sociocultural, human biological, and demographic variables. This scheme is operationalized further by conceiving, first, that the mechanisms of evolution that change the gene pool of a population are shifting the genetic "information" pool of the population, and, second, that the cultural traditions, practices, and knowledge form a "cultural information pool" which complements and supplements the "biological information pool" over time in any particular ecosystem. This second conceptualization allows us to test hypotheses about the mechanisms of storage, change, and transmission within the two information pools. A third information pool occurs when the cultural information "is no longer entirely stored in the collective biological (CNS) memories of its individuals" (Katz 1973, 331). This "extrasomatic information pool" becomes encoded with writing, printing, computers, and even the Internet. Hypotheses about the interactions of these three information pools have become the domain of the computer and information sciences on the one hand, and cognitive sciences and information on the other.

3. *Population and Human History.* Another means of assessing the significance of these evolutionary adaptations is examining their impact on population size of the species. For example, to help construct such a measure of the relations between population size and the evolutionary history of our species, we could construct an imaginary graph. If we plot time on the X axis (horizontal) and population size on the Y axis (vertical), we have to first choose an appropriate scale. Making each inch on the horizontal represent a thousand years gives some relevant perspectives. Our

genus *Homo* first evolved about two hundred feet ago. But civilizations as we know them only originated less than six inches ago; Christ was born two inches ago; the United States a little over one-fifth of an inch ago; I was born one-twentieth of an inch ago; and my son and daughter were born one-fiftieth of an inch ago. Thus our concerns about the most ancient remnants of civilization or of the advent of agriculture are all less than one foot ago.

With this perspective of the time scale, now let's plot population size on our graph of the scale of time. For this scale let each million people equal one inch of height. The best and admittedly crude estimates of the early population sizes for the genus *Homo* are approximately one hundred thousand, or one-tenth of an inch, for the first one hundred twenty feet ago. From a distance it would be impossible to distinguish the line from the X axis. By the time of the species, *Homo erectus*, that preceded us (*Homo sapiens*) perhaps forty to about fifteen feet ago, the figure had grown to a million, or one inch. Going on to the time of the famous cave paintings at Font de Gaum, Les Eyzies, and Altamira as long ago as two feet on the graph, the human population was two to three inches on the graph. With the discovery of agriculture a little less than a foot ago a significant jump occurred to about four to five inches. By the time the Sumerians were writing down the myth of Gilgamesh and the Pharaohs were building their first pyramids on the Nile some five to six inches ago, the size of the population had soared to eighty-five inches. When Christ lived some two inches ago the population may have stood some ten feet on our graph. By the time the first encyclopedia was published in 1751, or about one-fifth of an inch ago, the peak had jumped to over sixty-five feet high. By 1950, or one twenty-fifth of an inch ago, the peak was over two hundred feet tall; now it is over five hundred feet and is increasing every year by more people than had ever lived for the first 99 percent of the history of our genus and species.

How is it possible to have made this kind of transition in such a short period of time? What happened to all of the factors that limited our population size for so many thousands of centuries? What kind of barrier did we overcome to establish this immense population size? It is clear that the shift from a gathering and hunting means of subsistence to an agricultural mode, which greatly expanded food resources and allowed for a sedentary lifestyle to develop, was a key shift underlying the tremendous explosion of population size. It necessitated more effective systems of interacting with one another, development of cooperative enterprises, more effective communication systems, and more effective bureaucracies.

It is increasingly clear that over the last ten thousand years human population size has become an independent variable in the environment. This demographic dimension changed all of the basic parameters of human existence, from social systems to disease epidemiology, from the food we

eat to the awesome changes in the environment of the world. Whether the exponential increase in population size was the cause of social complexity or whether it is the effect of complexity, is not as relevant today as is the question about the current and near future overall effects of the behavior of our species upon the world environment. In other words, human population size and complexity has become in our lifetime a dominant determinant in our ability to adjust to the environment.

BIOCULTURAL EVOLUTION, RELIGION, AND COOPERATION AND CONFLICT

This section of the paper will explore the adaptive and evolutionary origins of human religion as a means of laying the groundwork for an analysis of the role of religion in the genesis of cooperation and conflict. The first part of this groundwork is laid out in a series of essays I have published over the last twenty-five years in *Zygon*, in which I have attempted to delineate several problems that are germane to the role of religion in the process of biocultural evolution. While it was not always possible to test hypotheses at such a macro level of organization, I have been able to make some significant headway toward this goal largely due to the collaborative insights of a number of us working together on a series of related problems. Briefly, these perspectives offer insights about the role of religion in the process of biocultural evolution. They also point to the potential role of religion in the maintenance of cooperation within societies and its role in the development of hostility and conflict between religious groups. In addition, I will briefly address ideas about what can be done to lower or avoid such hostility and lift up the role of religious behavior in fostering higher levels of world cooperation and peace.

Religion, Cooperation, and Kinship. Following the dramatic success of the neolithic revolution, humanity shifted away from a one-to-one dependence on hunting and gathering as the only mode of survival. Instead of everyone being directly dependent on the environment for sustenance, only those involved in the growing of crops were involved. Others could participate in other steps of the food production process including milling and brewing, manufacturing tools for farming, food preparation, and in defensive and offensive roles. However, in order to extend this relationship among people there had to be a stimulus to continue to cooperate in order to produce their goods and services and to survive. I have hypothesized that religion became a major source of the organizing sociocultural information that held these societies together over long periods of time.

Initially in small populations this condition was met relatively simply: elaborate kin relationships were established, and the maintenance of these relations provided the framework to work cooperatively. However, as the population grew beyond the limits of direct kin relationships (somewhere

between two hundred and four hundred), there was a strong tendency to fission the social group and begin all over again. In order to have continued capacity to produce and develop larger scale cooperative activities for food production with multigenerational investment of labor, such as in the case of early irrigation, there had to be authority beyond the role of kinship to provide sufficient motivation for a society to remain intact and cohesive. Otherwise the inevitability of scarce resources would force fissioning of the population.

I hypothesize that religious beliefs provided the mechanism for coherent cooperation to extend well beyond the immediacy of kin relations. Religious beliefs promoted cooperation beyond kin relations' altruism. In forming a kin relationship with a god or gods the individual established a direct lineage with the god and resulted in a quasi-kin relationship to all the others in the society who were unrelated genetically or so distantly related that the usual kin relationships were stretched to the limit. In other words, the unrelated or distantly related were now related in a special way, as if they were brothers and sisters, because they were all either children of god or had some special relationship with one or more of the gods in the more pantheistic world. The latter religions were more prevalent before the rise of monotheistic religions, which are highly characteristic of the largest worldwide religions of modern times. In contrast to these long-term religious traditions, monarchs and chiefs could also maintain order and cooperation, but their reign was usually a very short-lived phenomenon, rarely extending beyond the authority of a few generations. In the case of the religious order, the relation among individuals extends well beyond the temporal power of any monarch or dynasty. Thus beliefs in higher gods solve the problems of both synchronic and diachronic cooperation which help to optimize the continuity of the biocultural evolutionary information and order achieved by the previous generations.

There are additional advantages of deities playing a role in this process. The practice of religion extends well beyond the secular aspects and often involves those properties of the human mind that are particularly responsive to ritual and mythic practices. Hence there is a very strong psychic attraction (perhaps stemming from the rhythmic tuning of the sympathetic and parasympathetic systems) to the rituals that religion espouses. The net effect is that those factors associated with the religion become incorporated into the long-term survivability of the religious practice and beliefs. It is probable that the origins of human religious rituals go far back in our species' prehistory and may be part of the prehistory of our genus. In further consideration of the universality of religion among the diverse populations and cultures of the world, it is reasonable to suggest that religion is a species characteristic of *Homo sapiens* and that religious ritual is probably as old as the species.

This hypothesis generates at least two questions: Did religion evolve

biologically to become, like the capacity for speech, a part of the species? And second, What social evolutionary functions did religion provide for human sociality beyond that which is so deeply a part of our primate ancestors? In 1972, I attempted to delineate the origins of religion as a function of the human brain's capacity to impose order on a universe of disorder. During the evolution of the hominids, along with the rapid expansion in our ancestors' cerebral and intellectual capacity there appears to have been the evolution of functions and drives to organize and explain the circumstances and events of the life cycle of one's social group. I have defined this as human purpose with a small p. Hence, Purpose with a capital P is the explanation and coherent organization of the events of the human life cycle, from conception to death and beyond, of a particular group in time and space. The process of explaining the unknowns, fate, and circumstances of a group is often assigned to religious realms. Purpose is a product of the capacity of the human cerebral cortex and limbic system giving rise to the capacity and desire to provide order and explanation (Katz 1973).

Within any particular social group, Purpose also provides an established cumulative system of order to the vast majority that do not have their own independent system of order and explanation. Hence it adds stability by providing meaning to individuals whose evolved capacities of the CNS cause them to seek and make meaning out of the chaos that they naturally find in their environment. Purpose is the essential reference point for the human life cycle and is at the root of a social group's value system. Religion traditionally embodies at least two fundamental human capacities: myth and ritual. Myth, it can be argued, is at the center of the process of establishing Purpose, while ritual is the process that humans use to achieve full belief in or identification with the myth. In other words, humans are not only very sensitive to the abstraction that underlies myth but also to those various transcendental states that underlie the expression of ritual behaviors (see Katz 1975).

At the social level there is another important dimension to religion that underlies its continued advantages for the population as a whole. First, it provides an organizing principle upon which the group can maintain structure in the face of new and changing situations. This structure allows for more effective sharing of values and goals and facilitates sharing of group knowledge and, thus, increases the security and adaptability of the group. Hence there is a distinct advantage of a social group all believing the same myth and having the same value system. In times of emergency there can be effective communication among members sharing the same beliefs and values, while in others the practice of long-established tradition can provide a way of tapping into past strategies to solve a particular problem that may occur infrequently. Because religious tradition also embodies the fundamental myths of a society, it is likely that the most important knowledge on survival will become coevolved into the religious traditions.

Another evolutionary advantage of religion at the social level is the potential for religion and its interpreters to have authority beyond their individual ability to control events. All human groups have some kind of hierarchical structure, and religious authority is much more stable than secular authority because religion incorporates myths that transcend the individual. The group's sources of information may be balanced between the power of secular authorities and the power of religious tradition to restrain individuals who lead in a maladaptive direction.

In summary, the origins and adaptive significance of religion in the Paleolithic period (before the Neolithic period, which started about ten thousand years ago) of human evolution is characterized as providing the basis for storing the myth and rituals of a society. Myths provide the "backbone" of the storage of the most sacred knowledge a society maintains about its Purpose(s), and ritual becomes the important vehicle by which the myth is transferred from one generation to the next. Both myth and ritual are products of the human CNS organization and function. With respect to the information processing involved in biocultural evolution, myth provides a basis for storage and ritual the basis of transfer of knowledge about how to maintain purposeful adaptation from one generation to the next. Therefore, selection continues at the biological level for the CNS systems that generate, interpret, and perpetuate myth and ritual. Socially, religion provides for the cultural continuity of previously successful ways of interpreting the world and provides the social basis for morality and values. Moreover, it provides the basis for control of authority and balances the degree of control that any one individual can exert on the group as a whole. Finally, it can exist within the confines of small closely related kinship systems which do not require altruism to the same extent as do larger groups of unrelated individuals to maintain the group structure.

Religion and the Rise of Civilization. With the development of agriculture in the neolithic period there was a rapid growth in population and increased sedentism due to the tremendous increase in food resources. The members of the population could no longer be assumed to be genetically related in any significant way. There was also an increased need for authority in order to optimize the production of crops. Factors such as irrigation, trade for various ritual objects and tools, and increased differentiation of labor to harvest and process the raw produce into edible foods were all advantageous to the society as a whole. However, to accomplish this organization required a degree of central control. Authority to accomplish these new tasks was secular, but in order to succeed it may have had to have mythic religious or divine sanction to assure its power and continuity. Also in a large population there ultimately had to be a more explicit means of transferring the values from one generation to the next. This social complexity provided the basis for an increase in codification of values,

morality, and conduct to the point where these codes ultimately became laws. Religion still formed the basis of the most sacred stored knowledge of a society so that its most important traditions were embodied within the religious realm. Hence even food rules and traditions that were important to the survival of the population as a whole became embodied within religious tradition and ultimately became the cuisine of the society.

Perhaps the highly significant social advantages of increasing cooperation, which is characteristic of post-neolithic societies, may have resulted in a change in the relations between individuals and their kin with their god(s). It is reasonable to suggest that the form of social altruism that is yet unexplained by modern biology may have stemmed directly from a personal filial relationship that individual members of the religion had with their god(s). This relationship allowed each person who believed in the same religion to be a child in the family of his or her god(s). Everyone was related in this mythic way just as they would have been had they been genetically related to one another. Since the human CNS is particularly sensitive to mythmaking which is highly reinforced by ritual, it was possible to substitute this culturally abstract relationship for the genetic familial one. This process gave credibility to both the cooperation and altruism that was necessary to defend the population and even die, if necessary, just as would have been the case in defending a genetically related kin member. Thus, this transformation led to a new kind of kin relationship with co-religionists that had the potential of being as strong a bond as the genetic kinship bond if the religion was strong and its authority unquestioned.

So far, I have suggested that there are some major shifts in biocultural evolution relevant to our discussion on the potentials for security and peace. The evolution of the traditions associated with the paleolithic period of humankind is characterized in part by the net gains provided to the social group by (1) its needs for Purpose as I have previously defined it, (2) the advantage of a means of conservation of critical knowledge which becomes encoded in rituals, (3) the consolidation of authority in association with ritual religious practice, and (4) the integration of established genetic kinship. The neolithic stage is also characterized by supplying Purpose and a means of conservation of critical knowledge. This period extends through biblical times into the time of the great voyages and explorations. Moreover, with the exponential growth of human population came an increased need for authority, which was clearly enhanced and legitimized by religious sanction.

However, the most important new dimension in the neolithic stage that gave rise to extended cooperation was the use of kin related gods, which allowed unrelated individuals to relate as if they were closely related. While this stimulated the potential for new levels of cooperation within societies, it also led to new levels of potential conflict between societies that did not share the same religion. The combination of new legitimization of

authority through religion and its extended boundaries probably helped give rise to the potential for warfare at new levels. Thus the bioculturally evolved advantage within religions gave rise to the modern dilemma stemming from the conflict between religions and ideologies.

If we examine the sources of world conflict it is evident that many of the bitterest conflicts involve religious differences. The question for us to begin to ponder and ultimately to act upon is how current religious institutions contribute to this conflict and how they can be helped to restrain their followers to avoid the acts of violence that set off major conflagrations. Can secular societies possibly reproduce the feelings of love, loyalty, dedication, and sacrifice that are expressed within any of the current revitalization movements in our society? Ancient and modern history is replete with examples of this kind of conflict.

Religion and Science. Beginning approximately with the first explorations from Europe, there arose a conscious need to develop new technologies to help maintain the growing economic structures of Europe. This in part led to the development of science. However, science in the hands of Copernicus, Linnaeus, Newton, Lyell, and Darwin put forth facts and theories which shook and challenged the foundations of the mythic structures of European Judeo-Christian theology. The net result was a slow decline in the credibility of Purpose. These events did not happen in the absence of other change. There were increases in culture contact and conflict between religious groups, and rates of technological change began to accelerate social change to the point that in the nineteenth century there was widespread disaffection with the dehumanized social and economic conditions. Karl Marx's philosophy was a classic product of this period. The result of these times included the great revolutionary revitalization movements that occurred around the turn of the century.

In one sense science is the *enfant terrible* of world history, because, though it is still in its infancy as a tradition in world history, science has created tremendous change through its technological application. However, science has produced its fountainhead of knowledge without any serious evaluation of its value structure. In fact, only recently has it been recognized that any values other than a search for truth were present (see Katz 1980). The net effect of scientific discovery is the translation of this into new and more rapidly changing technology with a consequent destabilizing effect on the ability of the various world religions to adjust their explanations of the universe with those emerging from the scientific approach. The impact of this phenomenon can hardly be overstated. Science has provided the dominant mode for knowing the contemporary world. Yet, it has not provided any serious direction toward the problems of how humans should interact with the world ecosystem or with one another. While there is worldwide respect for the physical sciences and rapidly growing respect for

the biological sciences, there is much less for the social sciences. Hence there is little credibility in the very areas that could begin to use the scientific paradigm to make sense out of the social phenomena that give rise to the worldwide problems so clearly evident at the descriptive level.

Several important new and ominous shifts in the role of religion in human societies have occurred in recent times. First is the very serious threat to the myths that underlie the Purpose of most modern societies. This has resulted from a very rapid rate of change in technology that has proceeded much faster than the traditional religious perspective could possibly change. Secular authority has increased at a very rapid rate in order to keep up with the change, but religious change has not been able to keep pace because of its inherent conservative nature. (Witness the rise of liberation theology as an officially unaccepted attempt to keep pace in Latin America today.) There has been a tremendous increase in contact and communication between different religious groups due to the exponential rise in population size which strains the environmental resources that need to be shared and puts groups in direct competition with each other.

If we take stock about where we are and where we are going in attempting to answer these questions, several statements can be made. We are beginning to know about the way in which the human brain works and are putting broad theoretical perspectives together about human evolution in the biocultural sense. It is evident that science as it is now practiced is flawed by its nearly blind trust in a rudimentary and incomplete value system. We are beginning to understand the flaws in the nineteenth century social philosopher's conceptualizations of the world and recognize the limits of authority which does not have scientific credibility and religious values. There is a greater recognition of the limits of traditional religions and a rapidly growing understanding of the causes and courses of revitalization movements that span across borders into radical fundamentalism, as was the case in Iran. Finally, we have survived the threats of our own former President, who not so long ago spoke of Armageddon and "evil empires" while wielding the awesome power of nuclear weapons. We have also seen the dramatic recent reopening of churches closed for more than sixty years in the former Soviet Union, the introduction of a new level of freedom in Eastern European elections, and the destruction of the Iron Curtain in the region. Given the state of the world, it is time we ask our theological, religious, and ideological leaders to consider deeply the origin and significance of the current conflicts over value systems. They need to integrate the level of knowledge we do have from all perspectives and begin to use it in a much more global sense with the same wisdom that characterized the long history of the world's great religions.

To enact this global approach without the enlightenment and insights of modern science would miss the point and surely subject the endeavor to failure. Do we need scientific and religious leaders working together? I

think the answer is yes in the short term as we encounter and have to solve awesome problems of environment, demographic change, and threats to health, and weigh the advantages of the alteration of the genomes of many species of the world ecosystem including our own (see next section). Decisions related to these issues will have to involve creative new ways to generate novel bases for deriving our morals, ethics, and values in order to voluntarily implement them on a global basis. However, the answer in the longer term is to begin work now to encourage the development of a more holistic human enterprise in which our scientists are comfortable with religious explanations that are in harmony with our emerging understanding of human nature, the world, and the universe around us. This will require our religious and spiritual leaders to offer a kind of wisdom that continues to generate values and ethics which can successfully inspire the leadership and human commitment to use the accelerated way of knowing the world that science and technology are providing to make decisions that promote a new and more balanced future.

CONCLUSION: GLOBAL MORALITY

While human sacrifice and suffering are not new, and the need in the nuclear age for alternatives to the age-old conflict and warfare of the past is very great, there is a severe shortage of long range solutions to the overgrowth of human population. The sources of this situation and their conceptual analysis are laid out in the first part of this paper. There is an enormous potential for conflict and warfare in the resolution of problems related to scarcity and resource depletion, and the risk of nuclear holocaust is still great. We find ourselves in the late twentieth century surrounded by an enormous number of problems that have taken on a special concern, because the combination of our cultural way of life that emphasizes a consumptive materialism and our sheer numbers have cross-reacted with the environment to produce such serious problems that, if continued—and maybe if not completely reversed—may result in permanent degradation of the environment and massive alteration of the ecosystem of the entire planet. Even if we solve the environmental problems, rapidly developing epidemics like AIDS could eventually swamp the health delivery system of most developed nations and substantially lower the overall quality of health care, and thereby increase the morbidity and mortality of other diseases.

Emerging Strategies. Recently, however, we have seen the European nations take the lead in responding to the global depletion of ozone. It is possible, for example, that restrictions of global production of chlorofluorocarbons (CFCs) will result in a new level of cooperation. However, this is not likely unless there is a greater sacrifice among both the “haves” and the “have nots.” By this I mean that the “haves” will be able to replace the CFC used in refrigerants (CFC-12) with a more expensive and possibly

less efficient replacement, but the “have nots” will not be able to afford the replacement and therefore may be encouraged to continue to use the CFC-12 (the most pervasive source of CFCs in the environment). Thus, we are caught on the horns of a dilemma. The feeble attempts at global cooperation have no moral force behind them. The environmental changes, even if perceptible, are not fast enough, nor are the scientific data about the causes secure enough, to convince us of their unequivocal consequences. Thus the world will wait until a bad situation gets substantially worse before there is a sufficient will to stop the chlorofluorocarbon pollution. The costs are enormous, the current attentions to the problem are very limited, and the consequences of delay appear to be exponentially more serious than previously thought. What is needed is a greater willingness to change behavior of the entire world about a number of issues which will require substantial material and emotional sacrifice.

The principal institution in our society capable of leading the way toward such a level of sacrifice is clearly the religious and spiritual leadership of our country and of the world in general. We desperately need a global morality, one that transcends culture, race, ethnicity, politics, and religion. Such a morality must enable a spirituality that rewards self-actualization rather than materialism; love and kindness rather than selfishness; and enlightened wisdom rather than benign neglect. The second part of this paper suggested the background and possibilities for religion’s playing this traditional role in human affairs. It will take the most dedicated religious leaders and theologians to provide the kind of enlightened teachings to make this transition. And to do so will require a dedication that begins now. Waiting until after the millennium will be too late. The need is upon us, the problem is growing, and it is up to the religious and spiritual leaders to take the most significant challenge that all of humanity faces—the challenge of molding a global morality—and begin to lead, to teach, to reinvigorate, and to transform the emerging facts into a morality that can face the awesome challenges confronting humanity now and in the future. Contrary to every belief about the contemporary limits of the significance of religious institutions, I strongly believe they hold the greatest potential of helping us realign and develop a global morality that can work.

The new global morality does not need to be demoralized by the massive problems that face us. The times in which we live offer a historic opportunity to engage the entire world in redressing the imbalances that exist in the environment and worsen each day. First, we must move from basic knowledge about human values and morality to an examination of some of the major issues that confront us at a global level. Upon the shoulders of the spiritual leaders rests the responsibility for and the possibility of bringing about the conditions in which moral leadership can emerge. Out of respect for all that we have done in the past and can do with our enlightened understanding to relieve future suffering, we must

find ways to replace population growth with population stability, resource ownership with resource stewardship, concern for human superiority with respect for human variation, and consumptive materialism with an enlightened spiritual altruism.

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