

BIOCULTURAL EVOLUTION AND THE IS/UGHT RELATIONSHIP

by Solomon H. Katz

Science has one generally agreed upon value—it is truth seeking. Yet we are increasingly aware that the truth sought is highly relative to the society in which the problem, questions, and hypotheses are formulated. From the perspective of looking backward on history, each society appears to seek small and potentially culturally biased strips of truth which are difficult to separate from the context in which the particular truth was generated. The truth science seeks is probably not independent of other cultural values, and, whether science institutionally accepts it, its truths are intimately connected to the society's value structure. Broadly speaking, scientific truth on the basis that we now know it may be seen ultimately as no holier or ultimately less dogmatic than the holiness and dogmatism of religion. For example, one only has to witness physiology and medicine in recent years to understand the overwhelming human passion involved in the search for scientific truths. If science seeks truth, then we had better recognize that its questions are not nearly as dispassionate as its practitioners would like us to believe.¹

With the suggestion that the worlds of science and religion are not as far apart as they may seem, it becomes clear that the goal before us is to expose the myth that science is dehumanized, dispassionate, and purely rational because as soon as we have done so we are in the position to add the necessary humanism to the process of science and in fact improve upon the dilemmas associated with what may be the myths surrounding the use of scientific knowledge. As soon as we take that step, science no longer may be the same as it is now.

Solomon H. Katz, professor of anthropology at the University of Pennsylvania, 33rd and Spruce Streets, Philadelphia, Pennsylvania 19104, presented this paper at a symposium ("Value Affirmations and Scientific Fact: New Light on Is/Ought") sponsored by the Institute on Religion in an Age of Science and Rollins College and held in conjunction with the meetings of the American Academy of Religion, New York, New York, November 16-17, 1979.

[*Zygon*, vol. 15, no. 2 (June 1980).]

© 1981 by the Joint Publication Board of *Zygon*. 0044-5614/80/1502-0008\$01.23

Our current understanding allowed us to know, for instance, that the harmless nontoxic fluorocarbon propellant used in aerosol cans already has done what might be irreparable damage to the ozone in the upper atmosphere which inevitably will increase skin cancer rates and force us to change our behavior in the various activities we practice in the sunlight. In other areas we find that harmless preservatives turn out to be potential carcinogens. DDT, the single chemical that saved so many lives after the Second World War by wiping out the anopheles mosquito, turns out to be so very detrimental to a variety of animal species that some of these species, completely unrelated to the now DDT-resistant mosquito, may not even survive. While it is perfectly clear that these examples typify the vast problems we have created, we have seen fit in each of these cases to control the problem. We have examined various courses of action, evaluated their effects, and chosen the most suitable alternative. We have moved from as accurate a knowledge of the problem as possible to the prevention of, in this case, their manufacture and/or continued use.²

We have moved from what is to what ought to be.³ Granted that this move may not always be so simple, but the fact of the matter is that in its broadest terms we have moved from "is" to "ought" in the context of modern society.⁴ I propose that this phenomenon has occurred throughout human existence. By this I mean that there is a process whereby humans accumulate experience over time, measure the desirability of the experience against the yardstick of their cumulative knowledge and heritage, and determine what ought to be.⁵ How this process occurs, the directions it takes, and the degree to which it meets the short- and long-term needs of those involved as well as how it relates to the is/ought problem are in large part the subjects of this paper. I will address the modern origins of this problem and then trace the history and implications of the evolutionary paradigm as applied to humanity.

THE NATURE OF THE IS/OUGHT PROBLEM

If we accept the premise that our experiences of what we believe to be true are not value free, then it would seem that we should not have the problems that we have. All we have to do is hold up each new fact, each new statement of what is, and decide how its use ought to fit our circumstances best. Obviously this has not worked, and in part the reason relates to the rate of growth of new knowledge and its uncontrolled application to every known problem.⁶ While this has made a difference in the human condition, some attest that it has created more problems than it has solved.⁷ It appears as if the rate of growth

in knowledge over the last several hundred years has literally swamped the traditional process of transfer of "is" to "what ought to be." Because the traditional process of transfer of "is" to "ought" has a significant social component, it requires a certain amount of time to occur. Since the traditional nonsecular aspects of our society were unable to cope with the scientific and technological knowledge and material changes which were not originally part of the traditional system, more and more of the oughts became relegated to the secular world. This resulted in the formulation of formal processes of dealing with ought from what is. As the knowledge providing the basis of "what is" grew more rapidly than our traditional value system could handle and as the rates of change accelerated, there was increased dependence on laws and the legislative process for developing the oughts.⁸ Nevertheless the long-standing traditions of oughts from Judeo-Christian theology and practice form the underlying bases for the secular decisions which govern our society and which are the decisions that sustain modern science and technology.

SCIENCE, RELIGION, AND EVOLUTIONARY THEORY

As science has challenged the factual basis of the religious myths, it also has taken away some of the credibility of traditional religious values by direct confrontation as in the case of the creationists versus the Darwinists.⁹ In the midst of the beginnings of this confrontation between the biblical and Darwinian interpretations of human origins there were some important debates which appear to have had a direct bearing on the development of the social sciences and their further historic impact on the problem of is/ought relationships.

There is no doubt that in formulating the theory of evolution and the role of natural selection Charles Darwin was aware of its challenging implications not only for the biblical theory of creation but also for the most fundamental values underlying the rules for human existence. Both Darwin and Thomas Henry Huxley saw this clearly as evidenced by their writings on human capacities, including such topics as the evolution of morals.¹⁰ However, evolutionary theory was prone to misinterpretation and the older *scale naturale* concept that shows a scale of nature in which man, and particularly Western man, was on the pinnacle merged with the Darwinian notion of selection. Hence survival of the fittest with Western man at the apex was the natural order of things. This misinformation, an "is," became the "ought" of Social Darwinism. Regardless of the quality of the ideas of many of those early social scientists such as Paul Topinard, Lloyd

Morgan, E. B. Tylor, and Herbert Spencer, who speculated and theorized on the nature of humanity and society, there was an overall rejection of the use of evolutionary theory to explain anything other than the physical origins and evidence of human evolution. Of course this did not come about without sharp debates with members of organized religion and not without a great deal of new knowledge being developed on the unity (such as Tylor's and Spencer's acceptance of the "psychic unity of mankind") and diversity of the species.¹¹ Partly because of this and other related controversies and partly because early ethnographic field observations demonstrated unimagined human social activity, the conceptually attractive superorganic model of society developed by Spencer, analogous to a colony of ants, was finally completely rejected by the early 1900s. The great enlightenment and debate sparked by Darwinian evolutionary theory ended with a rejection of one of the first attempts to join the biological with the social aspects of human evolution. Cultural anthropology went one way and physical anthropology another.

By 1911 Franz Boas had formulated universal culture traits and was emphasizing, as did the British social anthropologists, empirical studies of the ethnography of various societies. As Alfred I. Hallowell in 1960 said,

... this preoccupation with culture led to re-creation of the old gap between man and other primates which, it was thought, the adoption of an evolutionary frame of reference would serve to bridge. The repeated emphasis given to speech and culture as unique characteristics of man side-stepped the essence of the evolutionary problem. Distinctive characteristics of the most highly evolved primate were asserted without reference to prior capabilities, conditions, and events in the evolutionary process that made this characteristic mode of adjustment possible. For unless culture and speech be conceived as sudden and radical emergents, they must be rooted in behavioral processes which can no more be considered apart from the general framework of behavioral evolution than the distinctive structural characteristics of man can be considered apart from morphological evolution.¹²

Nevertheless the conceptual basis of the universals within human culture was continued by anthropologists such as Clark Wissler. From the perspective of is/ought relationships, if enough is known about the oughts of various societies, anthropologists might come to understand what is fundamental to all human societies. Although this was implicit in the work of the 1920s by various ethnographers, the work of the 1930s, and particularly that of Ruth M. Benedict and Margaret Mead, raised a significant question. Were all values (and therefore the oughts) of society relative to the particular needs and specific history of a society? In other words, the values we have may not have any

relationship to the values and morals that other societies have. Hence any of our oughts may be relative to the peculiar development and history of our societal roots but not those oughts of the adjacent society.

In its extreme form, cultural relativism leaves us no choice but to go along with what is since we as outsiders do not know what ought to be. While most individuals who espouse cultural relativism do have values, the conceptual base of relativism does not necessarily generate an answer of what ought to be in the face of very devastating situations since the local conventions of morality are without absolute value. Nevertheless the cultural relativity of Benedict suggests that "it is possible that a modicum of what is considered right and wrong could be disentangled sufficiently to reveal that which is shared by the whole human race."¹³ Ayn Rand has taken this notion a step further in suggesting that survival instincts per se fit this model of universal morals and values.¹⁴ Hence she bases her ethnological approach on understanding a system of other ethics which is geared to survival. Altruism in this model becomes a specieswide mechanism of survival.

This idea of cultural relativism was taken several steps further by Alfred Kroeber, George Murdock, Clyde Kluckhohn, Melville Herskovits, and Claude Lévi-Strauss. Each suggests that the concept of universals must underlie some kind of specific unity in the tremendous diversity underlying the origins of cultural relativism. This implies that there are regularities to cultures which are so important that they form the basis of universals. If we are able to state these universals then we are moving toward an understanding of primary human need, and from there "ought" should come forth from "what is." But as Lévi-Strauss pointed out, the subject of universals demands our focus on "the origin and development of culture on which we have no information, and as far as we can tell at present, are unlikely to have."¹⁵

At about the same period that this group of anthropologists was testing the limits of this analysis of specieswide cultural universals, another group examined the role that extrinsic factors such as environmental variation and technology play in the similarities recorded cross-culturally. Although Gordon Childe, Julian Stuart, and Leslie A. White, among others, used this approach to make generalizations about culture, they never applied the same principles to human biology, and they certainly did not address the obvious interaction between biology and culture. Hence, in keeping with the tradition established in part by Boas, those who synthesized cultural universals, whether due to intrinsic or extrinsic factors, did not ever systemati-

cally attempt to determine their face validity within a biological framework. Once again any further derivation of the is/ought relation beyond the partly nihilistic position of cultural relativism was limited.

In the early 1960s another important advance was made when field studies of primate behavior such as those by Sherwood Washburn and Irvén DeVore demonstrated a highly significant interface between biology and behavior and between behavior and the social systems of primate groups. For the first time ecology, biology, and the social system were interacting parts of the same system of analysis. Likewise, in a separate realm, Anthony F. C. Wallace brought a strong biological dimension to behavior, and Noam Chomsky and others showed the significance of language and speech as biologically based.¹⁶ Ecological approaches began to discuss demographic dimensions, and the entire system of explanation shifted from description of universals in the 1950s and 1960s to explanations that dealt with universal processes.¹⁷ Anthropologists were still dealing with two models, but they were getting much closer. By the early 1970s a remarkable degree of receptivity developed concerning the use of biocultural and/or biosocial models of explanation in which adaptation and evolution were part of the same model.¹⁸ The ecosystems model of the early 1970s was one where biological, cultural, ecological, and demographic factors were considered principal variables in models of evolutionary change. Oughts in this model are developed by the cumulative experience of these interactions that arise over time from the ecosystem and the particular history of the population in question. They differ from the oughts of other societies because their system is different. What is for one society is not necessarily for another.

By carefully researching the origins within societies we hope to discern the extent to which they reflect a reality which operationally must be as valid as the most sophisticated "is's" emanating from modern science. In other words, the traditional flow of knowledge from "is" to "ought" is derived from very long-established traditions which tend to imbue the oughts with an aura of special significance. Because oughts are frequently based on the most adaptive "is's," they tend to carry with them a series of beliefs which tend to organize the "is's" into a system of oughts. The question for us to ponder is how "is's" traditionally get transferred to oughts and what the properties of "oughts" are that make them succeed or fail or in other words survive the test of time. What can we say about the process that has occurred in countless human societies that will help us make valid decisions

about how we can best use the vast resources of "is's" that are now available? If in a society thoughts were based on some facsimile of what is or what was, then that group or society survived. If it did not, it either changed, merged, migrated, or died out. Ought is a universal; without any oughts, human life from the social point of view is not human any longer. Since the process of incorporating oughts with significant survival value into religion has been occurring for long periods of time, there is a need to stop being concerned with the isolation of science and religion and to recognize that we need both these sources of knowledge (and value) to help us develop new ways of solving the moral dilemmas we are encountering.¹⁹ What we desperately need is a science of humanity which not only helps us choose among the "is's" in a way which fits our contemporary needs but also is sufficiently universal to anticipate how future knowledge might be integrated effectively so that our oughts can change in a more balanced manner.

This call for a science of humanity brings us to question how this rapidly developing body of knowledge in anthropology is interacting with the knowledge developing in science and philosophy. For this I would like to examine briefly the historical trends influencing the field of endeavor dealing with ethics since these trends are not very different from those in the social sciences. Both are extensively influenced by major historic events and by paradigmatic changes in science over the last century. For example, we have had Darwinsim, Social Darwinism, Freudianism, and cultural relativism. More recently the rise of biological theory and the molecular approach has provided a tremendous stimulus to the evolutionary approach to behavior being epitomized by Ernst Mayr's work on the synthetic theory of evolution and by the challenge of Edward O. Wilson's sociobiology.²⁰

Anthropologists have responded to sociobiology by taking a biocultural approach which demonstrates that human evolution, particularly since the neolithic revolution, involves the feedback between both cultural and biological spheres of evolution. In other words, genetic information is now only the flow of information among generations; the central nervous system (CNS) has evolved (and social institutions in response to this) for optimal flow of sociocultural information between generations as well. The sociocultural information necessarily must have a good fit with the genetic, but not necessarily a perfect fit. In this way the sociocultural information begins to select for characteristics that are adapted to the human sociocultural needs and not just the biological needs of the organism. Also the sociocultural information provides an exponentially increasing resource for

responses that complement and supplement the biological information resident at the level of DNA. If the flow of this information is as restricted as it is in other social organisms to a relatively few, very specific, and nearly invariant behaviors as in the social insects, or to the much more flexible but still limited number of communicative responses in the social primates, Wilson's concepts would be largely reasonable as a basis for explaining human evolution and a universal set of ethics.

I would argue that the criticism of the evolutionary ethics of Wilson by philosophers such as Mary Midgely is correct only in part.²¹ While on the one hand Wilson never categorically states that he has a proposal for a new system of ethics, he does call for more investigation of the evolutionary origins of the phenomena surrounding altruism, and he implies that the sociobiological explanation will account for most of the reciprocity phenomena involved in social systems. In this context Wilson carefully develops the concept that the evolution of the gene pool of the human species, as in other species, involves an interaction with those CNS substrates that promote successful social behavior. These behaviors are not free of their evolutionary origin. Rather they, like other behaviors, have a genetic evolutionary basis which requires the appropriate stimuli to obtain a particular response.

Nevertheless these behavioral systems are open systems that have the potential to handle an incredibly complex flow of information and incorporate an exponential increase in the size of the information pool. First, although not completely different from that of chimpanzees and gorillas, in terms of quantity the neural capacities required for speech and language ability are up to several orders of magnitude greater in humans than in other primates. Second, because codified information in other than spoken form can survive over long periods of time, this type of information is no longer subject to the same kind of constraints as that which is spoken. Likewise codified information creates new selective pressures on the genes and environment controlling the CNS by access and interaction with CNS functions largely through reading and writing. The adaptive advantages that increased access with this codified or extrasomatic information pool gives to the society that uses it is immense. To some degree it allows for the development of technologies that in a sense so heavily supplement many of the biological functions with which the entire system originally evolved that they replace these systems.

This suggests that new mechanisms need to be developed which can account for both biological and sociocultural needs that our current

and near future levels of development do and will require of us. Hence the challenge is not merely to discover the genetic basis of altruism because solving this problem will take us only one step ahead of what the late nineteenth-century Darwinists attempted and failed to do because of insufficient knowledge concerning genetics and evolution. Instead the challenge is to develop a system of ethical rules that fit both biological and cultural needs.²² They must incorporate enough of the traditional cultural values to maintain our emotional continuity and at the same time allow us to set priorities, evaluate courses of action, and make appropriate adaptive decisions on how to manage this incredibly large pool of information on "what is" and how this information ought to be used in the present and shaped in the future.

Hence our task is to recognize the historical constraints in the forms of religion, both as a necessary antecedent and as a valuable resource of sophisticated, well-evolved, conservative knowledge on how we function within a historic and ecological perspective; the fact that our social system is a product of our biological evolution; and the fact that some kind of new and as yet not fully understood or even described evolutionary process involving a supplementary, nongenetic information pool is occurring within the context of the modern industrial world at an unprecedented pace which is being matched in part by wide swings in the ecosystem and in the survivability of the species. However, new information is accruing so rapidly that we have reached a near standstill on its appropriate use because the only ethical system against which we have to evaluate it began to evolve several thousand years ago. Likewise the legal system set up to regulate it in modern times continuously falls prey to inappropriate manipulation since it too is a product of these previous systems of values.

Instead of developing a much clearer understanding of what this problem is, we have predictions of doom from such social commentators as Robert L. Heilbroner, who suggests that the Promethean myth be replaced by, in effect, zero growth of scientific knowledge.²³ In other words, right at the peak velocities of the collection of new knowledge some are suggesting that we abandon the scientific edifice and look elsewhere to solve our problems. What we must do to approach the solution of the is/ought problem and bring about a more balanced state of values in the late twentieth century and early twenty-first century is to understand both the limits of and the potentials for dealing with new knowledge and to develop a systematic way of grasping the effects and meanings of this rapidly changing information base. If we viewed its totality and its scope, we would be much more

effective in choosing its directions. I, as a social scientist, suggest that this job should begin at once and we should recognize how important the task is that lies before us.

If we do not pursue this task, we will go farther and farther out on more precarious limbs of decision based on systems of ethics that could do more and more harm to us, our neighbors, and our ecosystem even with the best of intentions.²⁴ To change metaphors, our knowledge could fill the hull of a vast ship which could complement and supplement smoothly our biological social needs for many generations to come. However, without a comprehensive system of ethics, the ship is afloat without a rudder in uncharted waters. In order for this ship to have direction (and perhaps a destination) we need to understand how knowledge grows and how it influences us. More generally we need to account for how biocultural evolution occurs in the late twentieth century. If we could predict its course, then we could begin to have a basis of what is and a comprehensive rationale for how to proceed with what we decide ought to be.

Thus the emergence of the evolutionary paradigm and its modern elaboration becomes an essential element of the is/ought question. Looking at the question from a logical perspective, we would have to conclude that an abstract, completely value-free "is" can never be strictly made into an ought. Nevertheless to deny the utility of the "is's" that we believe are useful is simply ridiculous.²⁵ One approach to the problem is to examine the origins of the "ought" side of the question. Using this approach, I believe we can demonstrate some of the fundamental properties of the ought, and we can show that oughts are part of an evolutionary process. This then would help us understand the overwhelming evidence that the vast majority of oughts do not stem from absolutes but rather from the relative values of the human system that developed them.

CONCLUSIONS

The models presented in this paper address two fundamental issues about humanity. First, they agree with the concept that humans are a product of their biological evolution; this directly involves the evolution of neural mechanisms which greatly facilitate social interaction. In turn this is related directly to some universal kinds of values. Second, they introduce the concept that humanity has created over and over again impressive pools of social and cultural knowledge that supplement and complement the biological potentials for adaptation to the ecosystem in which the human population resides. This pool of knowledge and its mechanisms of transfer (communication) among

members of a society become so important that they provide a major source of selective evolutionary pressure on human neurobehavioral substrates. The nature of these selective pressures becomes very complex when we deal with the effects of knowledge that is in stored form (I have called this extrasomatic), and, because the added adaptive advantage is potentially so great for the society at large, it is used effectively to solve various human problems. However, its influence on our traditional values, which are largely based on a different level of knowledge, is immense. We do not know or have a thorough grasp of the ways in which this latter system operates. Without such rules the use of traditional values to decide on fundamental problems of life that were never encountered before becomes meaningless. Hence there is a very significant need to understand not only the sociobiological underpinnings of the genetic evolution of some of the fundamental human emotions but also the biocultural evolution of biologically complementary and supplementary knowledge and its effects upon humanity. If this new understanding is going to be useful to modern problems, then even greater attention is going to have to be focused on understanding the development and biocultural significance of an immense extrasomatic pool of knowledge. Specifically I suggest that such an understanding will give rise to a new kind of symbolic myth which satisfies the human need for order and religious meaning.

Another issue that tends to support the significance of my contention for developing this new level of understanding, as well as for developing new myths and symbols, comes directly from a more thorough understanding of the is/ought problem. First, some modern philosophers such as R. M. Hare and John Rawls are challenging the entire question of is/ought by indicating that it is not necessary to be concerned with the jump from is to ought since the product is so useful.²⁶ Also anthropologists have found that in traditional societies there appears to be a very clear flow from is to ought, particularly if looked at in terms of the native or "emic" explanations. However, if we examine this flow in terms of modern science, most traditional philosophers such as G. E. Moore suggest that it is not possible to traverse from the objective reality of what is to what ought to be. It is possible that since all human societies have oughts that are derived from their experience about what is, then we should examine the potential that the reality of our "is's" is not as objective as it was presumed to be. This brings up the third issue being demonstrated by a number of historians of science, that scientific fact is not value free. In other words, if our notion of "what is" contains values, then the

transition of is to ought becomes much more acceptable since they are part of the same spectrum of human knowledge and its application to human problems. Since this suggests that the is/ought problem need not be represented by the dichotomy that has been used in the past, it appears to help us in deriving a series of oughts from the proposed development of a more comprehensive biocultural evolutionary model which recognizes both the potentials and the limitations of the facts that it may generate.

NOTES

1. J. D. Watson's "double helix" is an unusually good example of this phenomenon.
2. A useful summary of this process was published in *Science* 207 (1980): 394-95. Thomas Maugh, a science reporter, carefully summarized the results of the findings of the National Academy of Sciences report but mentions the considerable difficulty getting appropriate governmentally organized departments to respond to the threat that the continued use of fluorocarbons represents.
3. David Hume's *Enquiry Concerning the Principles of Morals* and *A Treatise of Human Nature* represent an excellent early discussion of the problems of the relations of "is" and "ought." In the latter he is noted for first stating what has become known as "Hume's Law": . . . "I am surpriz'd to find that instead of the usual copulations of propositions, is and is not, I meet with no proposition that is not connected with an ought, or an ought not. This change is imperceptible; but is, however, of the last consequence. For as this ought or ought not, expresses some new relation or affirmation, 'tis necessary that it should be observ'd and explain'd; and at the same time that a reason should be given, for what seems altogether inconceivable how this new relation can be a deduction from others, which are entirely different from it" (bk. 3, pt. 1, sec. i).
4. The problem of moving from "is" to "ought" has been addressed in one form or another in a wide variety of contexts throughout the history of Western philosophy and religion. Briefly stated, in normative ethics there are two principal perspectives used for justifying the rules for human conduct. One perspective, the deontological, argues in favor of fundamental laws which are to be adhered to without question. Within religion the Ten Commandments of the Old Testament are a primary example, and within philosophy Immanuel Kant's categorical imperatives provide an important case. The other perspective, the teleological primarily articulated in more modern times by Hume, implies that morality can be operationalized to its products and is related to the development and fulfillment of natural human tendencies. Later under the nineteenth-century utilitarians this becomes modified into themes stressing greatest good for the greatest number of society in the work of Jeremy Bentham. While this emphasis on the ends rather than the means and the ends has been criticized, the concept of the division between the two perspectives in normative ethics extends into the twentieth century as well. In formulating metaethical theories G.E. Moore in his *Principia Ethica* in a sense suggests that rather than use our knowledge of what is in its greatest sophistication we instead should depend on an intuitive sense of the "is" to derive what obvious "oughts" must be present. It is possible that in modern philosophical terms there appears to be a much more rational assessment of the relation of "is" to "ought" and, more important, a reassessment of the validity of categorizing "what is" as a special unbiased fact. (See Philip Hefner's "Is/Ought: A Risky Relationship between Theology and Science," in *The Sciences and Theology in the 20th Century*, ed. A. R. Peacocke [London: Oriel Press, 1981]). Actually both the deontological and teleological perspectives share themes related in part to modern evolutionary theory. The latter as

developed in this paper and in several others I have published in *Zygon* ("Evolutionary Perspectives on Purpose and Man," *Zygon* 8 [1973]: 325-40; "The Dehumanization and Rehumanization of Science and Society," *ibid.* 9 [1974]: 126-38; and "Toward a New Science of Humanity," *ibid.* 10 [1976]: 12-31) suggests that a major shift in technology occurred around the neolithic in which the adaptive success of the individual as a member of a small group became complicated by an ever-increasing emphasis on the sociocultural dimension of adaptability. This was particularly important as small groups coalesced into more sedentary populations of agriculturalists. Thus for most human evolution the adaptive strategies involved an emphasis on the individual and upon those features which in a utilitarian sense satisfied natural human tendencies. However, as more complex postneolithic societies evolved, individual needs and tendencies became increasingly counterbalanced by those of the larger group. The codification of the latter resulted in new balances between the individual and his society. In other words the net gain to the individual of greater insularity from the selective pressures provided by the natural environment was counterbalanced by the increased selective pressures on his behavior provided by increased social regulation which allowed for new levels of biosocial evolution. Since the codification of absolutes for the control of individual behavior in larger groups appears to have evolved principally from the requirements of the sociocultural dimensions, it may help to explain the deontological perspectives in normative ethics that morality is controlling and even oppressive to human nature. This theme recurs in the work of more modern philosophers. E.g., the intuitionists, emotivists, and even the existentialists each take a fundamental position on the relations of the individual to his society and attempts to build a framework which emphasizes one or the other without resolving the origins of the relations of the two. This appears to be the case whether it is the intuitive derivation of goodness that Moore attempted to show as indefinable or the emotivist attempt as in the work of A. J. Ayers to isolate moral judgment as any kind of rational act which is independent from human perception and nonrational, emotionally based human values. Also the same theme arises in the existentialist argument that disavows general moral principles since the objective examination of all moral problems is made foremost by an individual who is caught in a rapidly changing twentieth-century world view.

5. Émile Durkheim first articulated this theory in his *De La Division Du Travail Social* (Paris: Alcan, 1893).

6. Another reason that this has not worked relates to the problems inherent in utilitarianism.

7. One of the recent challenges to the uncontrolled growth of knowledge by science is Robert L. Heilbroner's *An Inquiry into the Human Prospect* (New York: W. W. Norton & Co., 1974). The papers of an Institute on Religion in An Age of Science symposium on this topic are in *Zygon* 10 (September 1975).

8. This traditional process of transfer refers to those social institutions which gradually incorporated newly developed knowledge into the core of fundamental information that allowed the continued existence of the particular sociocultural system. The advent of science beginning with Copernicus and the associated technological change have continued to accelerate social change to the point where the role of religious institutions as the traditional conservators of well-tested knowledge steadily declined.

9. Durkheim.

10. Loren Eiseley documented this very well in *Darwin's Century* (Garden City, N.Y.: Doubleday & Co., 1958).

11. This section of the paper dealing with the historic development of the field is adapted from a longer discussion in a paper I presented at the Centre International d'Études de Bio-Anthropologie et Anthropologie Fondamentale at Abbaye de Royaumont, France, in 1972. Subsequently the paper was published in French, German, Spanish, and Japanese editions under the title "The Unity and Diversity of Man from the Point of View of Social and Cultural Anthropology," in *Unite de l'Homme*, ed. M. Piatelli-Palmeri (Paris: Editions du Seuil, 1975).

12. Alfred I. Hallowell, "Self, Society and Culture in Phylogenetic Perspective," in *The Evolution of Man: Man, Culture, and Society*, ed. Sol Tax, Evolution after Darwin, vol. 2 (Chicago: University of Chicago Press, 1960), pp. 309-71.
13. Ruth M. Benedict, "Anthropology and the Abnormal," *Journal of General Psychology* 10 (1934): 79.
14. See Ayn Rand, *The Virtue of Selfishness: A New Concept of Egoism* (New York: New American Library, Signet Books, 1961).
15. Claude Lévi-Strauss, "French Sociology," in *Twentieth Century Sociology*, ed. G. Gurvitch and W. Moore (New York: Philosophical Library, 1945).
16. Anthony F. C. Wallace, *Culture and Personality* (New York: Random House, 1961). See also Noam Chomsky, *Current Issues in Linguistic Theory* (The Hague: Mouton, 1964).
17. See M. Harris, *Culture, Man and Nature* (New York: Thomas Y. Crowell Co., 1971).
18. Katz, "Evolutionary Perspectives" (n. 4 above).
19. See the paper that Donald T. Campbell has presented on this theme in this symposium.
20. See Ernst Mayr, *Animal Species and Evolution* (Cambridge, Mass.: Harvard University Press, 1963). While parts of the synthetic theory recently have been challenged by the growth of new knowledge in genetics, embryology, paleontology, and geology, the major role of selection appears to play just as important a role on behavior as it did when Mayr first wrote this book. (For further information on this topic see the summary of the Chicago meeting on macroevolution in *Science* 210 [1980]: 883-87.) Also see Edward O. Wilson, *Sociobiology: The New Synthesis* (Cambridge, Mass.: Harvard University Press, 1975).
21. See Mary Midgley, *Beast and Man* (Ithaca, N.Y.: Cornell University Press, 1978).
22. While it is not the task of this paper to suggest a solution, it is useful to suggest that there is a need for some kind of evolutionary source of oughts in which the individual reward is understood well enough to encourage participation in the oughts for the continued dynamic homeostasis of the human ecosystem.
23. Heilbroner (n. 7 above).
24. There is considerable evidence that such destruction of the ecosystem is taking place. E.g., there is growing concern that a rapidly increasing number of animal species are significantly declining such that it is unlikely they ever will recover.
25. See discussion in n. 4 above particularly as it pertains to twentieth-century schools of philosophy.
26. Two useful summaries of their work appear in W. F. Frankena's "Recent Conceptions in Morality," in *Morality and the Language of Conduct*, ed. H. N. Castenada and G. Nakhnikian (Detroit: Wayne State University Press, 1963), and M. Warnock's *Ethics since 1900* (Oxford: Oxford University Press, 1960).