

This essay is a condensed version of a paper presented last October at a conference jointly sponsored by Lecomte Du Nouy Foundation and the University of Notre Dame.

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The various opinions concerning man's place in nature can be grouped into two broad categories which I shall call, for want of better terms, the religious and the secular. Leaving aside questions of detail, about which there may be considerable difference of opinion, the religious outlook is characterized by the view of man as a transcendental creature who has, inherently, duties and privileges that extend beyond what is applicable to the rest of nature. Furthermore, and perhaps more basic, is the concept that there exists, in some not-necessarily-defined form, a God who in some way controls and directs the natural world, although He is beyond the control of natural laws.

The secular view denies both these propositions. Stated more positively, it sees man as one animal species among millions of others, with no inherently special privileges beyond what it makes for itself by virtue of its unique mental capabilities. There is no supernatural God, and whatever happens does so in accordance with universally applicable natural laws, all of which are potentially, at least, understandable by man.

The religious viewpoint, as given here, is obviously based on undemonstrated, in the scientific sense, and unprovable axioms. Secularists like to believe that their world outlook is coldly rational and built on a solid foundation of demonstrated truths. This, however, is hardly the case. Secularism demands a considerable investment of faith to grease its wheels and to make it intellectually viable, just as does the religious outlook.

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Efforts have been made by outstanding scientists like Lecomte du Nouy, Teilhard du Chardin and E. W. Sinnott, to construct secular, scientific frameworks upon which to drape the cloak of a religious view of man's nature. With all due respect to the profound thought and effort that has gone into these attempts, I am myself convinced that no true synthesis is possible at the present time. There is no evidence or logic available to either side that is so overwhelmingly convincing that all serious opposition must inevitably submit, or so innocuously bland as to be absorbed by the other side with minimal disruption of its own principles.*

My purpose, therefore, is not to attempt reconciliation or to present arguments in favor of the religionists but rather to discuss a dilemma faced by the secularists. Specifically, if all of nature is planless as to its ultimate end and, therefore, purposeless, and if man's unique mental and spiritual equipment is just another example of blind evolutionary diversification, then man, like other animals, had no planned entry into this world and no planned functions to perform once he arrived. In that case, how does the secular humanist justify his well-known concern for man's ethics and morals, concepts which imply goals and standards, and thus plan and purpose.

The full difficulty of the problem becomes apparent only after dismissing from our minds the Western ethical system in which we have grown up, with its notions of right and wrong, and good and bad. This is necessary because the Jewish and Christian thinking which forms the core of Western ethics, is based on revelation, and revelation must be completely rejected as a source of knowledge in the secularist framework. To discover a truly

* A concrete example of how differently religionists and secularists can view the same natural occurrences is the Six-Day War. For millions of Jews, myself included, the sequence and confluence of events in May and June of last year which led finally to the recovery of Old Jerusalem, were so improbable and had such apocalyptic overtones, that they could only be viewed as the clearest demonstration of Divine intervention that we could expect to see in our lifetime. And yet all took place between men of flesh and blood wielding tangible fire and steel, all is describable at a secularist level, and all is no doubt so entombed in State Department memoranda.

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naturalistic ethic, if one exists, we must look at the world through the eyes of an amoral viewer, unencumbered with pre-conceived standards of behavior.

Bentley Glass, in an article titled "The Ethical Basis of Science"¹, formulates a very biological answer to the question. He says: "The evolutionist is quite prepared to admit the existence of right and wrong in terms of the simple functions of biological structures and processes. The eye is for seeing. . . . Sight conveys information about food, water, danger, companionship . . . and other vitally-important matters. Should one not then say 'To see is right, not to see is wrong?'"²

Glass thus makes an assumption that, in naturalistic terms, it is better to survive, by using one's senses, than not to survive, say by ignoring one's senses. In the economy of nature, however, there is no indication that it is preferable for an atom of iron, for example, to be part of a hemoglobin molecule in a living animal, than to be part of a ferric oxide molecule in a mineral deposit. Thus, Glass' assumption is not at all implicit in the facts of nature but is rather a human decision that life is "better" than non-life.

Granting Glass his assumption as naturalistic, which it is not, extrapolation of his principle leads immediately to what are, ethically, somewhat horrendous results. For example, if the eye is for seeing and, therefore, seeing is good, then, since the claw is for killing, killing must also be good. In a hunting animal with a well-developed brain, like man, weapons are extensions of tooth and claw; therefore mental activity to improve weapons for killing is natural and good, too. It follows, then, that the Germans, for example, exercising their biological right to improve their conditions as they saw them, can hardly be condemned on naturalistic grounds for murdering six million Jews and four million other nationals, since they were simply using their natural gifts. The clinching evidence that the German behavior must have been "right," in Glass' naturalistic terms, is that Germany emerged from the blood-bath with a higher potential for survival than any of her victim peoples.

Actually, of course, Glass does not extrapolate in these terms, choosing instead to call "good" only those aspects of mental

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activity which we would all applaud as good and right. But the basis for his choice cannot be read out from an examination of biology. Rather, he is simply reflecting his heritage of revelatory Western ethics.

Gaylord Simpson rejects all efforts to derive ethical systems from an examination of non-human biology since, in his view, evolution is a completely amoral process.³ However, since man, by some evolutionary quirk, does possess a moral sense, Simpson feels constrained to create, rather than derive, an ethical syllabus, based upon his own personal evaluation of what is important and unique about man's nature. Thus, to Simpson, acquisition and promotion of knowledge, personal responsibility, and enhancing the integrity and dignity of the individual, form the cornerstones of an ethical edifice suitable for *Homo sapiens*.

The fatal flaw in Simpson's program is his determined effort to keep one foot planted firmly in each of two irreconcilable positions. On the one hand he states: "These ethical standards are relative, not absolute. . . . They are based on man's place in nature, his evolution, and the evolution of life, but they do not arise automatically from these facts. . . ." ⁴ Furthermore, he states: He can choose to develop his capacities as the highest animal and to try to rise still farther, or he can choose otherwise. The choice is his responsibility, and his alone.⁵ On the other hand, Simpson also says flatly: "Authoritarianism is wrong. . . . This is an ethically wrong denial of the personal responsibility inherent in man's nature. . . . Totalitarianism is wrong. The concept of a state as a separate entity with its own rights and responsibilities contravenes the biological and social fact that all rights and responsibilities are vested by nature in the individuals that compose the state."⁶

Thus Simpson would have his cake, i.e., propose an ethical system based, presumably, on man's natural history, and eat it, too, namely, disclaim any authority for his system in the case of anyone who chooses to see man's nature in different terms. Ironically, the one nation in the world that is most overtly secular and Darwinian in its view of life, the Soviet Union, is also among the most completely authoritarian.

From Simpson's view that nature is amoral, and that man

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evolved accidentally, it must follow that man cannot be charged with obligations to the rest of nature or even to his own species. Thus, *any* behavior that will somehow satisfy his accidentally evolved sense of right and wrong should be acceptable. The artist who views creativeness in man as more important than acquisition of knowledge, the demagogue who recognizes the attraction to the masses of strong and disciplined leadership, the communist who places the welfare of the community above the welfare of the individual, all are equally as entitled as Simpson to create systems of behavior that would maximize those uniquely human attributes which they favor. Simpson's own ethical proposals are wonderfully early 20th century American vintage but, by his own estimation, they are not implicit in man's nature. It seems obvious that they reflect Simpson's American Christian heritage much more than any naturalistic, evolutionary determinism.

The least naturalistic and most metaphysical attempt to provide a non-revelatory ethic for man is made by Julian Huxley in a rather long essay on "The Humanist Frame."⁷ In this often lyrical, sometimes sermon-like paean of secular humanism, marred here and there by poor biology* and fuzzy politics,** Huxley avoids the dilemma we are considering by simply ignoring one of its horns. Thus, he takes for granted, without any reasoned justification, that although man is part of a compre-

* In order to make the point that "Improved organization gives biological advantage" Huxley writes: "Thus the rise of the placental mammals was correlated with the decline of the terrestrial reptiles, and the birds replaced the pterosaurs as dominant in the air" (p. 75). In point of fact, it is well-known that reptiles remained the dominant terrestrial vertebrates for 80-100 million years after the appearance of birds or mammals. The two latter classes did not become prominent until *after* the great extinction of reptiles in the Cretaceous for reasons that remain completely unknown.

** Among the "challenging monsters in our evolutionary path" Huxley lists "the rise and appeal of Communist ideology" and the failure to bring China into the world organization of the United Nations (p. 82). Aside from the vapidness of considering evanescent political maneuvering in the context of human evolution, there is the question of intellectual consistency in, on the one hand, resisting Communist ideology, and, on the other, welcoming Red China into the United Nations.

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hensive, unplanned evolutionary process, he cannot avoid playing a decisive role in this process. Presumably, this is due to man's superior intellect, but Huxley offers no justification for his decision to place this intellect at the disposal of nature as a whole, rather than restricting it solely for man's own aggrandizement or for some other purpose. Huxley says: "Man's destiny is to be the sole agent for the future evolution of this planet."⁸ A tall order for a race of saints, not to speak of a congregation of secular humanists.

In this respect Huxley departs widely from Simpson, offering man not a choice but a burden. He calls ever for improvement of man as an individual and in society, for permitting man full artistic and creative fulfillment, for surrounding man with beauty and love, and so on, including even the ceremonials of religion, carefully emptied, however, of any notions of Divinity.

From this brief examination of these three approaches to naturalistic ethics it appears that non-human nature does not present us with an ethic that would be acceptable to most of us, and that humanist proposals from Western professors of biology have more in common with Jewish and Christian revelation than with ineluctable conclusions implicit in a godless universe. In fact, one often has the impression of being offered revelation without religion by these prophets of secularism.

We are still left with our original dilemma — morals for man in an amoral universe. The heart of the difficulty, of course, is the secularist concept of man as really just another unplanned life-form, endowed only accidentally with his unique social and intellectual qualities. This notion is so contrary to the practically universal, intuitive feeling that man represents something more than purposeless existence, that the evidence offered in its support deserves the most careful scientific scrutiny before it, and the problems it brings in its wake, can be accepted.

According to widely-accepted views, man's evolutionary history within the mammals is said to begin with prosimian ancestors living in the Paleocene-Eocene epochs, some 60-70 million years ago. These smallish animals, similar in appearance to modern lemurs, lorises and tarsiers, have left fossil remains in Europe and North America. For reasons not really understood,

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these animals disappear from the fossil record before the close of the Eocene, reappearing again in the Pleistocene, about 50 million years later. The morphology of modern representatives of these groups appears to differ little, if any, from their presumed ancient precursors.

Between the prosimian primates of the Eocene and the ape-like fossils from the Miocene, about 15 million years later, only a small handful of teeth and fragments of jaw have been found, all in a single locality in northern Africa, in what is now Egypt. The relationship of the animals that left these fragments to other ancient or recent forms needs to be inferred without benefit of any supporting information concerning cranial volume, limb structures or living habits; essentially all conclusions are based on dentition alone.

About 20 million years ago, in the Miocene, there lived in Europe, Africa and Southern Asia species of primates that left fossil records, mostly in the form of assorted tooth collections. Pieces of jaw and limb bones also occur, sufficient to assign the remains to ape, rather than monkey sources. Except for the skull and some fragmentary bones found in East Africa, to which the name *Proconsul* has been applied, these dental shards are essentially all that are available from this period. Concerning the Miocene fossils Romer states: "Our knowledge of the fossil history of these higher apes [gorilla and chimpanzee] and of presumed human ancestors on this level is tantalizingly poor. . ." These fossils have all been placed in the genus *Dryopithecus*, and this ghostly assemblage of teeth has been set up as belonging to the probable ancestors of man.

Continuing with this Hominid lineage — the group that includes the modern apes and man, we encounter another gap in the record of about 18 million years between the Miocene genus *Dryopithecus* and the more recent fossils of the Pleistocene. This gap is relieved only by a few teeth and jaw fragments from India and Africa, assigned to the genus *Ramapithecus*. Nothing is known about the cranium or limbs of the creature that left these teeth but, again on the basis of dentition alone, *Ramapithecus* has been placed in or close to man's ancestral tree.

The fossil record of the Pleistocene epoch, which includes the

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last one to two million years, reveals in relatively rapid succession the Australopithecines, *Pithecanthropus*, Neanderthal man and, starting about 30,000 years ago, modern man. *Australopithecus*, found in South Africa, possessed projecting jaws equipped with great but human-like teeth, and appears to have been an erect, bipedal anthropoid. Nevertheless, the volume of his cranium was only about 550 cubic centimeters, which is within the range of the chimpanzee and gorilla, and less than half of man.

Pithecanthropus, called by some *Homo erectus*, has left remains primarily in Eastern Asia, comprising so-called Peking and Java man. Dentition and stature of this group were man-like but, as in *Australopithecus*, the face was projecting and chinless in the ape-like manner. The brain-case was low with very heavy browridges but was a bit less than twice the size of the South African primate. There are indications that *Homo erectus* used simple stone tools and fire.

During the last glacial period of the present epoch, *Homo neanderthalis* made his appearance, remains having been recovered mainly from Europe but also from the Middle East, Asia and Africa. Although Neanderthal man had a brain as big as or bigger than that of modern man, the appearance of his skull was rather different; the supraorbital ridges were very heavy, the forehead was low and the large brain size was achieved by enlargement of the back part of the skull; the chin was formed rather weakly.

Relics of a primate who, in all ascertainable physical respects was comparable to modern man, are found starting about 30,000 years ago. The forehead is high, the nose and chin strongly formed, and the teeth and jaws of man-like size and appearance. Olson has the following to say about this species, which bears our own name: "This rather dramatic and sudden appearance has left some doubts as to where *Homo sapiens* came from. The advanced Neanderthals are not appropriate ancestors, but some of the earlier ones may have been. It would seem that *Homo sapiens* developed somewhere beyond the range of present finds of fossil men and then, fully matured, penetrated rapidly into the lands of the Neanderthals, replacing this less advanced type

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during a relatively short span of time.”¹⁰

By 15 or 20 thousand years ago this man was painting the walls of his shelters, perhaps in connection with cultist practices related to hunting, and his cultural progress can be followed in broad terms up to historic times. This man, therefore, who appears suddenly and discontinuously as a full human, is the direct ancestor of present human populations.

It appears to me that an objective, non-prejudiced reading of the fossil record of the primates hardly confirms the story, repeated endlessly in popularized accounts, of clearly-defined transitions from ancient lemuroids to tarsioids to apes, to man-apes, and finally to modern man. On the contrary, the story reconstructed from the tangible evidence, as opposed to speculation, is one of tremendous gaps in the record both of time and space, of tenuous grasping at teeth, almost to the exclusion of the rest of the body, to establish phylogeny, and of gross discontinuities between forms supposedly related to each other by direct genetic descent. Responsible paleontologists readily admit in technical print the difficulties of interpreting the actual record. Nevertheless, secularist interpretations are offered freely, and we need now to look at the reliability and precision of the interpretative methods that are used.

A first point which we cannot avoid raising concerns the concept of the mechanisms of evolutionary diversification. To quote Mayr on current theory: “The proponents of the synthetic theory maintain that all evolution is due to the accumulation of small genetic changes, guided by natural selection, and that transpecific evolution is nothing but an extrapolation and magnification of the events that take place within populations and species.”¹¹ In terms of the magnitude of the effects being dealt with, it may be proper to compare this statement with one claiming that the explosion of a nuclear device, for example, is entirely explainable by simple extrapolation from what is known about the detonation of sticks of dynamite.

Strain differences within species commonly involve changes of single nucleotide pairs in the sequences comprising the genetic DNA of the species. Man, as well as many other vertebrates, possesses on the order of 5 billion nucleotide pairs per diploid

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cell. If the matching of sequences between man and other primates averages about 90 percent, as appears to be the case from the *in vitro* hybridization work of McCarthy, Hoyer and their associates¹² this means that 10 percent of the sequences are different; or in other words, differences in 500 million nucleotide pairs have had to accumulate in the DNA sequences of the species involved since man and the other primates diverged from a hypothetical common ancestor. This figure is perhaps subject to change by a factor of as much as 10, depending upon technical details which remain yet to be worked out, but it gives one some idea of the range with which we are dealing.

To presume, without any direct evidence, that differences of such magnitude accumulate in a simple additive manner in the same way that differences in a few nucleotides accumulate between isolated strains of the same species, is to assume a most unscientific posture. In no scientific discipline, including other areas of biology, does one consider acceptable the direct extrapolation over a range of eight orders of magnitude from data collected only at one extreme of the range. Nevertheless, this is the assumption that forms the basis of the modern synthetic theory of evolution.

Dependence on tooth structure is so strong in accounts of primate evolution that it is pertinent to ask how well does primate tooth morphology reflect the morphology of the rest of the animal? Simons says: "It is of considerable interest that the skeletal material of *Pliopithecus* now available shows that although definably hylobatine dentally [similar to *Hylobates*, the modern gibbon], the forelimb elongation so characteristic of modern gibbons is barely noticeable in this Miocene form."¹³ The metaphysical question of whether it is the teeth or the forelimbs that make a gibbon need not concern us; what is important is that one is not necessarily a guide to the other. In fact, the accepted evolutionary principle of mosaic evolution which holds that different organ systems may and often do evolve independently of one another, would caution us against drawing general conclusions on the basis of a single system alone. Nevertheless, practically all speculation concerning the ancestry of man up to the Pleistocene is based essentially on scattered tooth

remains only.

In the absence of the living animal or other evidences, the habits of ancient species must be inferred from the structure of their fossilized skeletons. Observations of living primate species show that such inferences may be widely in error. For example, the gorilla, which is anatomically a brachiating creature fitted for an arboreal life, is in real life a terrestrial species usually getting around in a modified quadrupedal manner.¹⁴ The gibbon, which is highly arboreal in habit, with forelimbs specialized for acrobatic swinging among the branches of trees, is also the most adept of the apes at walking in an erect, bipedal manner.¹⁵ The implications for speculation concerning phylogenies and natural selective pressures of these confusing associations of one kind of anatomy with another kind of habit hardly needs any further emphasis.

With what precision and on what grounds can one place a particular animal in the evolutionary progression from primitive to advanced status? It is generally assumed, for example, that monkeys represent a more primitive primate condition than the great apes. But the fossil record of Old World primates shows the presumably more advanced apes appearing earlier in time than the presumably more primitive monkeys. Old World monkeys first show up in the record, and then only in limited numbers, in the Pliocene about 10 million years *after* the appearance of the apes. Romer has the following to say about the New World family of little monkeys, the marmosets: "A peculiar feature in all except one marmoset is that the last molar has been lost, the only case of its complete reduction among primates [although man is approaching this condition]. . . . It has been thought that the marmosets are the most primitive of monkeys, but features such as the molar loss suggest that they are specialized rather than primitive."¹⁶

A perennial problem in constructing phylogenies is to distinguish between common ancestry and diverse ancestry followed by parallel or convergent evolution. Simons comments concerning some extinct primate lines: "The common qualities of tarsines and necrolemurines could be attributed to parallel evolution as was implied by Hürzeler. However, if common characters

