CHARLES DARWIN ON THE TELEOLOGY OF EVOLUTION

by

Jonathan Wells
Advisor
International Religious Foundation
New York, New York

The Seventeenth International Conference on the Unity of the Sciences
Los Angeles, California November 24-27, 1988

CHARLES DARWIN ON THE TELEOLOGY OF EVOLUTION

by Jonathan Wells

Berkeley, California

In the cultural evolution of man, the influence of ideas on human behavior ought not to be overlooked. One such idea is the notion of goal or purpose. For example, the conviction that certain types of behavior fulfill a divine plan or purpose lies at the root of morality for many people, and thereby exercises a profound effect on human actions. Even people who are not explicitly or consciously religious often behave as though their lives have a purpose which cannot be reduced to selfish gratification or mere survival. Teleology, then, is a concept which influences human behavior, and warrants consideration in any full discussion of evolution.

Paradoxically, however, teleology may (in some sense) be contradicted by the very notion of Darwinian evolution itself. The emphasis here is on "Darwinian," because there is not necessarily a conflict between teleology and the notion of evolution in general. In this context, evolution refers to the origin and diversification of living organisms, by some process

in which later stages are derived or descended from earlier ones. Darwinism, on the other hand, refers to Darwin's particular theory about the mechanism of evolution. This distinction is justified not only conceptually, but also historically and scientifically: historically, because the notion of evolution pre-dated Darwin, and even after 1859 was used to refer to philosophical and scientific ideas which owed nothing to the Origin of Species; and scientifically, because evolution is well documented by the fossil record, the results of radioactive dating, and the geographical distribution of living species, but it is by no means empirically established that all features of evolution are the result of Darwin's proposed mechanism.

Even having distinguished evolution from Darwinism, it is still possible to use "Darwinism" to refer to several different theories about evolutionary mechanism. As used in this essay, "Darwinism" refers to the theory set forth by Charles Darwin himself in the various editions of Origin of Species, The Descent of Man, and The Variation of Plants and Animals Under Domestication, as illuminated by his correspondence. Darwin's theory ascribes evolution to the natural selection of small variations which occur among the individuals in any given species. According to the theory, those variations are random with respect to the fitness of the individual or to the direction of evolution (i.e., they do not arise in response to the needs of an organism or in accordance with any plan), and

any given environment "selects" (in a manner analogous to a breeder of plants or livestock) those individuals whose variations render them more likely to survive (i.e., natural selection is survival of the fittest).

What are the implications of Darwin's theory for teleology? Darwin himself gave considerable thought to this question. Of course, one need not accept Darwin's answer. His thinking on the subject is of considerable interest, however, especially since before turning to biology he had been trained as a clergyman, and had been deeply influenced by the argument from design for God's existence which was a prominent feature of nineteenth-century Anglo-American thought.

By 1859, when the Origin of Species was published, Darwin had reflected at length on the teleological implications of his theory, and had become convinced that it conflicted with theological notions of design in the creation. But Harvard botanist Asa Gray, who was Darwin's most influential ally in nineteenth-century America, disagreed; and when a friendly controversy erupted between the two men over teleology, Darwin was forced to sharpen his thinking on the issue. In what follows, Darwin's views on teleology are examined in his own writings and in the context of his dispute with Gray.

Darwin's Theory

In the Origin of Species, Darwin lists several factors that he believes are responsible for the production of new species. The first is variation: "under changing conditions of life organic beings present individual differences in almost every part of their structure." A second is inheritance, through which organisms characterized by certain variations will "tend to produce offspring similarly characterized." The third is a "severe struggle for life" due to the fact that "many more individuals are born than can possibly survive." The fourth factor is the principle by which variations favorable to survival are preserved, while unfavorable ones are destroyed; and "this principle of preservation, or the survival of the fittest," Darwin calls "natural selection".[1]

According to Darwin, "many laws regulate variation, some few of which can be dimly seen." These include direct and indirect effects of "the conditions of life", the effects of "the use or disuse of parts", and "correlation", by which Darwin means that variations in one part of an organism may be linked to variations in another. Only variations which are inheritable are important for his theory, though "the laws governing inheritance are for the most part unknown." Why a particular variation is sometimes inherited and sometimes not, "no one can say," but it is clear from domestic breeding that variations can often be transmitted through many generations.[2]

Darwin notes that "a struggle for existence necessarily follows from the high rate at which all organic beings tend to increase." Since similar organisms, dependent on the same food or environmental conditions, must compete with each other for limited resources, the struggle for life is "most severe between individuals and varieties of the same species." Under such circumstances, "individuals having any advantage, however slight, over others, would have the best chance of surviving and of procreating their kind." On the other hand, "any variation in the least degree injurious would be rigidly destroyed." This "natural selection," which Darwin compares to the conscious selection of the domestic breeder, "leads to the improvement of each creature in relation to its organic and inorganic conditions of life." Given a sufficient number of generations, Darwin believes that "the small differences distinguishing varieties of the same species steadily tend to increase, till they equal the greater differences between species of the same genus, or even of distinct genera." Once life was "originally breathed by the Creator into a few forms or into one," the "production of the higher animals" would then directly follow from the laws of variation, inheritance, the struggle for life, and natural selection.[3]

In the Variation of Animals and Plants Under Domestication, Darwin reiterates his conviction that "species have generally originated by the natural selection, not of abrupt modifications, but of extremely slight differences." The

natural laws governing the origin of these differences are largely unknown, but include the changing conditions of life, use and disuse, and correlation. Extrapolating from the evidence of domestic breeding, Darwin concludes that "not only the various domestic races, but the most distinct genera and orders within the same great class, -- for instance, whales, mice, birds, and fishes, -- are all the descendants of one common progenitor." Under the influence of natural selection, "each slight modification of structure which was in any way beneficial under excessively complex conditions of life, will have been preserved, whilst each which was in any way injurious will have been rigorously destroyed. And the long-continued accumulation of beneficial variations will infallibly lead to structures as diversified, as beautifully adapted for various purposes, and as excellently coordinated, as we see in the animals and plants all around us. Hence I have spoken of selection as the paramount power, whether applied by man to the formation of domestic breeds, or by nature to the production of species."[4]

Although Darwin noted in the Origin of Species that by this theory "light will be thrown on the origin of man and his history," in the Descent of Man he explicitly extends his conclusions to the human species: "man incessantly presents individual differences in all parts of his body and in his mental faculties. These differences or variations seem to be induced by the same general causes, and to obey the same laws as

with the lower animals. In both cases similar laws of inheritance prevail. Man tends to increase at a greater rate than his means of subsistence; consequently he is occasionally subjected to a severe struggle for existence, and natural selection will have effected whatever lies within its scope." According to Darwin, this scope includes the evolution from lower animals of not only the human body, but also "mental powers" and "moral qualities".[5]

Both the Origin of Species and the Descent of Man contain occasional references to the notions of chance and design. In the Origin of Species, Darwin explains that although he sometimes speaks of variations as if they were due to chance, this is "a wholly incorrect expression, but it serves to acknowledge plainly our ignorance of the cause of each particular variation." Similarly, he believes that the notion of design often serves as a confession of ignorance: "It is so easy to hide our ignorance under such expressions as the 'plan of creation,' 'unity of design,' &c., and to think that we give an explanation when we only re-state a fact." In the Descent of Man, Darwin's concluding summary contains the following carefully worded passage: "The birth both of the species and of the individual are equally parts of that grand sequence of events, which our minds refuse to accept as the result of blind chance. The understanding revolts at such a conclusion, whether or not we are able to believe that every slight variation of structure, the union of each pair in marriage, the dissemination

of each seed, and other such events, have all been ordained for some special purpose."[6]

In the Variation of Animals and Plants Under Domestication, Darwin discusses design at much greater length. He does this, however, in response to the views of his friend and defender, Asa Gray.

The Controversy With Gray

Asa Gray was already a renowned botanist by the time Darwin published his Origin of Species. Raised a Presbyterian, Gray became a Congregationalist when he joined the faculty at Harvard, and he remained a moderate Calvinist throughout his life. Like other Protestant naturalists in the first half of the nineteenth century, Gray was heavily influenced by natural theology, and the argument from design played an important part in his thinking. Unlike many of his contemporaries, however, he became convinced of the general notion of evolution even before 1859; and when the Origin of Species appeared, he immediately welcomed it as an ally in his opposition to advocates of the immutability of species, such as Agassiz.[7] Agassiz attacked Darwin's theory as atheistic because it claimed that species are derived from other species by natural causes, rather than created immutable by divine design. Gray argues that the evolution of species by natural causes is neither atheistic nor

incompatible with design: it is not atheistic because it merely claims that what was previously thought to be accomplished by God "directly and at once" was actually accomplished "indirectly and successively;" and it is not incompatible with design because design is inferred from the "evidence of contrivance" in the results, not from whatever mechanism produced those results. Gray concludes that the argument from design "is just as good now, if we accept Darwin's theory, as it was before that theory was promulgated." At this stage in the discussion, however, Gray is not yet dealing with the specific mechanism proposed by Darwin, but only with the general notion of evolution by secondary causes.[8]

When Gray does turn to Darwin's proposed mechanism, he sees in it both an advantage and a disadvantage. The advantage is that the Darwinian mechanism accounts for the useless and harmful adaptations for which the older teleology had no explanation. The disadvantage is that the mechanism also accounts for useful adaptations in a way that seems to exclude design. Gray deals with this apparent exclusion of design by arguing for designed variations.

Gray believes that since naturalists see design in species, they are justified in seeing design in the variations which give rise to species, especially since the causes of variations are unknown. Thus "we should advise Mr. Darwin to assume, in the philosophy of his hypothesis, that variation has been led along

certain beneficial lines. Streams flowing over a sloping plain by gravitation (here the counterpart of natural selection) may have worn their actual channels as they flowed; yet their particular courses may have been assigned." Gray also compares variations to raindrops: those which fall into the ocean "are as much without a final cause as the incipient varieties which come to nothing! Does it therefore follow that the rains which are bestowed upon the soil with such rule and average regularity were not designed to support vegetable and animal life?" Gray does not insist, however, that all variations must be designed: "the accidental element may play its part in Nature without negativing design in the theist's view." Indeed, the accidental element in Darwin's theory is the basis of its advantage in explaining useless or harmful adaptations. But useful adaptations testify to design, and since natural selection merely picks out variations which are independently presented to it, the presence of design in the result indicates that at least some variations are designed.[9]

Darwin disagreed. He wrote to Gray that he was "charmed" with the stream metaphor, but could not believe that variation "has been led along certain beneficial lines." Darwin thought that Gray, to be consistent, would also have to believe "that the tail of the Fantail was led to vary in the number and direction of its feathers in order to gratify the caprice of a few men." Underlying Darwin's rejoinder, apparently, is his assumption that the uniformity of natural law excludes supernatural

intervention and thus dictates that either all variations are designed or none of them are. Since so many variations are useless or harmful, Darwin maintained that "it is illogical to suppose" that all variations are designed. It was in response to Gray's arguments that Darwin summarized his position as being "inclined to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance."[10]

It was also in response to Gray that Darwin concluded his Variation of Animals and Plants Under Domestication in 1868 with the metaphor of a house built by an architect using uncut fragments of stone found "at the base of a precipice." Darwin explains that "the fragments of stone, though indispensable to the architect, bear to the edifice built by him the same relation which the fluctuating variations of each organic being bear to the varied and admirable structures ultimately acquired by its modified descendants." The shape of each fragment "may be called accidental, but this is not strictly correct; for the shape of each depends on a long sequence of events, all obeying natural laws." Nevertheless, "in regard to the use to which the fragments may be put, their shape may be strictly said to be accidental." In Darwin's metaphor, of course, the architect is natural selection.[11]

The accidental character of variations leads to "a great difficulty," and although Darwin acknowledges that in attempting

to face it he is "travelling beyond" his "proper province," he elaborates its implications: "An omniscient Creator must have foreseen every consequence which results from the laws imposed by Him. But can it be reasonably maintained that the Creator intentionally ordered, if we use the words in any ordinary sense, that certain fragments of rock should assume certain shapes so that the builder might erect his edifice? If the various laws which have determined the shape of each fragment were not predetermined for the builder's sake, can it with any greater probability be maintained that He specially ordained for the sake of the breeder each of the innumerable variations in our domestic animals and plants; -- many of these variations being of no service to man, and not beneficial, far more often injurious, to the creatures themselves? Did He ordain that the crop and tail-feathers of the pigeon should vary in order that the fancier might make his grotesque pouter and fantail breeds? Did He cause the frame and mental qualities of the dog to vary in order that a breed might be formed of indomitable ferocity, with jaws fitted to pin down the bull for man's brutal sport? But if we give up the principle in one case, -- if we do not admit that the variations of the primeval dog were intentionally guided in order that the greyhound, for instance, that perfect image of symmetry and vigour, might be formed, -- no shadow of reason can be assigned for the belief that variations, alike in nature and the result of the same general laws, which have been the groundwork through natural selection of the formation of the most perfectly adapted animals in the world, man included, were

intentionally and specially guided." If we assume that they were, then "the plasticity of organisation, which leads to many injurious deviations of structure, as well as that redundant power of reproduction which inevitably leads to a struggle for existence, and, as a consequence, to the natural selection or survival of the fittest, must appear to us superfluous laws of nature. On the other hand, an omnipotent and omniscient Creator ordains everything and foresees everything. Thus we are brought face to face with a difficulty as insoluble as that of free will and predestination."[12]

The stone house metaphor is explicitly intended to be a refutation of Gray's claim for designed variations. According to Darwin, "however much we may wish, we can hardly follow Professor Asa Gray in his belief" that variations are directed. In his American review of the book, Gray took what Darwin called "a good slap" at the metaphor: according to Gray, the metaphor demands that "not only the fragments of rock (answering to variation) should fall, but the edifice (answering to natural selection) should rise, irrespective of will and choice!" In a letter to Darwin, however, Gray privately conceded that "I found your stone-house argument unanswerable in substance (for the notion of design must after all rest mostly on faith, and on accumulation of adaptations, etc.); so all I could do was to find a vulnerable spot in the shaping of it, fire my little shot, and run away in the smoke. Of course I understand your argument perfectly, and feel the might of it."[13]

Toward the end of the controversy described above, an interchange occurred between Gray and Darwin which appears to some eyes to imply exactly the reverse of all that went before. In 1874, Gray wrote a review article for Nature in which he praised "Darwin's great service to natural science in bringing it back to Teleology: so that, instead of Morphology versus Teleology, we shall have Morphology wedded to Teleology." Darwin read the article and promptly wrote to Gray: "What you say about Teleology pleases me especially, and I do not think any one else has ever noticed the point. I have always said you were the man to hit the nail on the head."[14] Christian Darwinians Aubrey Moore and George Frederick Wright interpreted Darwin's appreciative comment as proof that "the Darwinians themselves testify" to design.[15] Several twentieth-century writers have intepreted the exchange as evidence of Darwin's "muddle" over design, as indicative of Gray's belief that Darwinism would serve to "buttress" the argument from design, or as "the benevolent tolerance of the victors" in Darwin's inner circle following his repudiation of Gray on the design issue.[16]

The historical context of Gray's remark, however, shows that the issue was not primarily design. In nineteenth-century biology, teleology and morphology referred to two competing methodologies: the former, following Georges Cuvier, explained organic structures in terms of function, by studying the purpose they serve in adapting an organism to its "conditions of

existence;" while the latter, following Etienne Geoffroy St.-Hilaire, explained them in terms of form, by studying their resemblance to structures in other species to discover a "unity of type." The former method was unable to explain the resemblance between homologous structures serving different functions, such as a bear's foot and a human hand. The latter method, in contrast, seemed much more adaptable to the evolutionary notion of descent from a common ancestor. The growing popularity of evolutionary ideas thus led to a comparative neglect of the teleological method among biologists.[17]

Darwin believed that by accounting for structures as the products of both adaptation to the environment and descent from a common ancestor, his theory reconciled the two approaches. He writes in the Origin of Species that "on my theory, unity of type is explained by unity of descent. The expression of conditions of existence, so often insisted on by the illustrious Cuvier, is fully embraced by the principle of natural selection." Gray had seen the significance of Darwin's reconciliation as early as 1860, when he referred to the tension between teleology and morphology and concluded that "Mr. Darwin harmonizes and explains them naturally. Adaptation to the conditions of existence is the result of natural selection; unity of type, unity of descent."[18]

Morphologists as well as teleologists, however, tended to believe in design, though the morphological notion of design emphasized regularity of pattern, while the teleological notion emphasized utility. The apparent denial of design by Darwin's theory thus offended not only the teleologists but also many morphologists. Darwin's reconciliation of teleology and morphology, therefore, did not mean that he was promoting design, and was not interpreted that way by contemporary biologists. Otherwise, Huxley would not have written in a single paragraph that Darwinism is "entirely and absolutely opposed to Teleology, as it is commonly understood," and that "the apparently diverging teachings of the Teleologist and of the Morphologist are reconciled" by it.[19]

Therefore, to construe the 1874 exchange between Gray and Darwin on the relationship of morphology and teleology as indicating a reconciliation between them on the issue of design is seriously to misinterpret it. After Darwin's public repudiation of Gray's view in 1868, both men seem to have recognized that the gulf between them on this issue was unbridgeable. The two remained good friends, however, and the exchange dealing with morphology and teleology seems to have been conducted with genuine good humor: both were well aware that "teleology" meant both "design" and "functional method," and according to Gray's biographer "Gray knew he was making a joke when he said that Darwin had reintroduced teleology into natural history."[20]

Darwin's Correspondence

Darwin's basic position remained the one he took in the Variation of Animals and Plants Under Domestication: natural selection is the paramount power, but it merely preserves beneficial variations and eliminates harmful ones; variations are due to natural laws, many of them unknown, but they are undirected in the sense that they arise without any regard for the welfare of the organism or the progress of evolution; and although the mind cannot conceive of the universe as the product of chance, the assumption of an omnipotent and omniscient creator would imply that all its details are designed, but the undirected character of natural selection and variation seems to contradict this assumption. Darwin reiterates this position many times in his personal letters. Natural selection is analogous to domestic selection, but unlike the latter its only purpose is survival: the organs which it produces "have been formed so that their possessors may compete successfully with other beings, and thus increase in number." Furthermore, just as Darwin could not regard "each variation in the rock-pigeon, by which man has made by accumulation a pouter or fantail pigeon, as providentially designed for man's amusement," so he could "see no reason why he should rank the accumulated variations by which the beautifully adapted woodpecker has been formed, as providentially designed." As a result, the detailed design on which Paley based his argument disappears: "We can no longer argue that, for instance, the beautiful hinge of a

bivalve shell must have been made by an intelligent being, like the hinge of a door by man. There seems to be no more design in the variability of organic beings, and in the action of natural selection, than in the course which the winds blows."[21]

According to Darwin, neither natural selection nor variation, the two major elements of his theory, provides an opening for design. Although he compares natural selection to an architect, he repeatedly denies that he intends to attribute conscious agency to it. He repudiates the anthropomorphic connotations which many of his contemporaries associate with the selection metaphor, insisting that he uses it only "as a geologist does the word denudation -- for an agent, expressing the result of several combined actions." Since natural selection is powerless without variations, which arise independently of it, he sometimes wishes he had used the term "natural preservation"; but by the time the confusion became obvious, the former term was "so largely used abroad and at home that I doubt whether it could be given up." In addition to this negative reason for retaining the term, Darwin has positive reasons as well: natural selection is analogous to artificial selection not only in its dependence on variations, but also in the impressiveness of its results. Natural selection solves the problem of how organisms become adapted to the conditions of life, "as artifical selection solves the adaptation of domestic races for man's use." Furthermore, the former is more efficient than the latter: a domestic breeder "scarcely selects except external

and visible characters, and secondly, he selects for his own good; whereas under nature, characters of all kinds are selected exclusively for each creature's own good." Darwin can thus see "no limit to the perfection of the coadaptations which could be effected by Natural Selection." It is still the case, however, that "natural selection means only the preservation of variations which independently arise."[22]

In what senses, then, could natural selection be said to produce designed results? One twentieth-century study of Darwin's own views on the subject concludes that there are at least three such senses: natural selection (1) will always produce adaptation of the organism to its environment, (2) will never produce in an organism structures that are harmful to it, and (3) will never produce structures in one organism solely for the benefit of another. Since these can legitimately be regarded as "purposes," it would be incorrect to say that Darwin considers natural selection totally purposeless. On the other hand, natural selection does seem to exclude the claim that specific organs or organic forms are designed. According to Darwin, not even organs of sight or the order of primates, much less the human eye or the human species, could be considered designed results of natural selection.[23]

Darwin also denies that variations, the second major element in his theory, could lead to designed results. His reasons for this denial are scientific, philosophical, and theological. The

first category includes the observation that the vast majority of variations are useless or harmful rather than beneficial. It thus makes no sense to Darwin to say that variations are designed: if someone says "God ordained that at some time and place a dozen slight variations should arise, and that one of them alone should be preserved in the struggle for life and the other eleven should perish in the first or few first generations, then the saying seems to me mere verbiage. It comes to merely saying that everything that is, is ordained." The second category of reasons includes the philosophical assumption that naturalistic science is competent to investigate and explain the origin of species. The idea that "each variation has been providentially arranged seems to me to make Natural Selection entirely superfluous, and indeed takes the whole case of the appearance of new species out of the range of science." The third category includes Darwin's conviction that designing each slight variation would be beneath God's dignity and contrary to God's benevolence. Referring once again to the breeding of domestic pigeons, Darwin notes that "it seems preposterous that a maker of the universe should care about the crop of a pigeon solely to please man's silly fancies." Furthermore, "I cannot persuade myself that a beneficent and omnipotent God would have designedly created the Ichneumonidae with the express intention of their feeding within the living bodies of Caterpillars, or that a cat should play with mice. Not believing this, I see no necessity in the belief that the eye was expressly designed."[24]

Darwin reasons that unless all variations are designed, none of them are. If the "interposition of the Deity" is uncalled for in the case of domestic variations, he could "see no reason whatever for believing in such interpositions in the case of natural beings." Or "if anything is designed, certainly man must be," but Darwin "cannot admit that man's rudimentary mammae...were designed," therefore (by implication) man is not designed. Such all-or-nothing reasoning seems to be based primarily on Darwin's commitment to naturalistic explanation: either the origin of species can be explained in exclusively naturalistic terms, or it cannot really be explained at all. Darwin writes that he "would give absolutely nothing for the theory of Natural Selection, if it requires miraculous additions at any one stage of descent." To a lesser extent, his reasoning may have been based on his understanding of the idea of God: if the deity were going to pre-ordain <u>any</u> details, then an omnipotent and omniscient deity would presumably pre-ordain <u>all</u>; but a wise and benevolent deity would not ordain many of the details which are actually observed; therefore (by implication), <u>no</u> details are pre-ordained. Whatever the basis, Darwin's reasoning leads him to conclude that <u>all</u> variations are undesigned.[25]

Darwin nevertheless maintains that variations are due to natural laws. Since he acknowledges that many of these laws are unknown, it would seem to be possible for each variation to be completely pre-determined by natural causes; and his theory is

sometimes interpreted as being deterministic in this sense.[26] If this interpretation were correct, it would be possible to maintain that the course of evolution was pre-determined from the beginning. Darwin's theory, though incompatible with a theistic notion of providential design, would nevertheless be compatible with a deistic notion of deterministic design: it would not exclude the possibility that even though the laws of evolution are autonomous, God pre-programmed them to produce exactly those forms of living things which have actually emerged. It seems very unlikely, however, that Darwin would agree with this interpretation. Although by "chance" he sometimes means only that the causes of variation are largely unknown (leaving open the question of determinism), he sometimes means that their causes involve an irreducible element of uncertainty, at least with respect to their function in evolution. His metaphor of the stone house in the Variation of Animals and Plants Under Domestication is the classic statement of this view. Although it is "not strictly correct" to call the shape of the fragments of stone accidental, since their shape "depends on a long sequence of events, all obeying natural laws," yet "in regard to the use to which the fragments may be put, their shape may be strictly said to be accidental." Referring to this passage years later, he explains that "the only way I have used the word chance," at least in its strict sense, has been "in relation to the variations of organic beings having been designed," or (in other words) "in relation only to purpose in the origination of species."[27] One recent study of

Darwin's notebooks concludes that despite his ambivalent use of the word "chance" he is convinced that the relation of variability to evolutionary improvement is basically a random affair.[28] Darwin thus rejects deterministic design as well as providential design.

This does not mean, however, that Darwin is willing to attribute every aspect of evolution to chance. He repeatedly affirms his "inward conviction" that "the Universe is not the result of chance." Although he distrusts this conviction, since he believes that the human mind is descended from the minds of lower animals, he appears to be genuinely persuaded of "the extreme difficulty or rather impossibility of conceiving this immense and wonderful universe" as "the result of blind chance or necessity." This puts him in "a simple muddle; I cannot look at the universe as the result of blind chance, yet I can see no evidence of beneficent design, or indeed of design of any kind, in the details." Although he fears that the issue may ultimately be incomprehensible, he is "inclined to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance."[29]

This last statement is probably the best summary of Darwin's mature position on design. Although it is likely that he never resolved the question of ultimate purpose to his own satisfaction, he at least believed that his theory does not

exclude all design: someone could embrace Darwinism and yet consistently maintain that natural laws, including the laws of variation and natural selection, are designed. According to Darwin's own understanding of the theory, however, specific details are due to chance, not merely in the sense that their causes are unknown but in the sense that they are really accidental. Neither of the two major elements in the theory can be plausibly interpreted as directed: not variation, because it is predominantly useless or harmful; and not natural selection, because its only function is to insure that the few survivors of the struggle for life will be better able to withstand the next round. If evolution is really due to these two factors, then the particular forms taken by organisms, species, genera, and orders are accidental. Therefore, Darwin's version of Darwinism excludes the possibility that any specific form of life is designed. In particular, it implies that human beings, as the latest products of an inherently directionless process, must be regarded as undesigned.[30]

Concluding Remarks

In the controversy between Darwin and Gray, there are good reasons for preferring Darwin's interpretation. He was clearly more committed to the theory than he was to any notion of design, unlike Gray, who continually attempted to tailor the theory to his prior conviction that living organisms evidence design. Darwin was thus in a position to consider the design implications of his theory more dispassionately than Gray.

Furthermore, Darwin's interpretation is reasonable. His theory includes two basic elements, (1) variations and (2) natural selection. If (1) variations are designed, then either (a) all of them are designed, or (b) some of them are. If (a) all of them are designed, then God must have designed the majority of them to be useless or harmful, which is absurd. If (b) some of them are, then God is intervening in the course of natural processes, which takes the whole matter out of the realm of science and renders the theory scientifically useless. If (2) natural selection is designed, then God must resort to preserving or destroying variations which arise independently of divine control, which means that God is not really God (at least, in the Christian sense). It also means that design is limited to whatever enables an organism to survive, which hardly seems like an adequate notion of design at all. <u>If</u> evolution really is caused by the natural selection of accidental variations, then it seems unreasonable to regard its detailed results as designed. The reasonableness of this interpretation does not, of course, mean that it is the only possible one; but it does mean that it deserves more consideration than if it rested merely on Darwin's authority.

According to Darwin's interpretation, the implications of his theory for teleology are:

(i) the laws of nature (including the law of natural selection) may be regarded as designed; but

(ii) no particular outcome of the evolutionary process (including the human species) may be regarded as designed.

With regard to implication (i), Darwin's theory is no different than other scientific theories, in the sense that whether natural laws are designed (e.g., by God) is completely outside the realm of empirical science. With regard to implication (ii), however, Darwin's theory differs from theories such as Newtonian (or even quantum) mechanics, in the sense that Darwinism allows no prediction of any determinate outcome.

Note that the issue here is not methodological agnosticism with regard to design, but a complete exclusion of designed results. The former, it seems, is a necessary characteristic of all scientific theories, and in that sense such theories might be called "ateleological." Darwin's theory, however, according to his interpretation, takes a further step and might properly be called "antiteleological." To illustrate: Newton's laws of motion ignore the issue of design, but they may be used to produce designed results; given a complete knowledge of initial conditions, the result can be predicted. Darwin's theory, however, precludes this.

According to Charles Darwin, then, his theory denies that evolution is in any way guided with respect to its results. At stake is not so much God's existence as God's nature: a teleological proof for the existence of a deity could still be based on the general orderliness of the universe, but the deity has ordered the universe such that the human species is an accidental outcome of a basically random process rather than the special object of divine love.

Notes

1. Darwin, Origin of Species, 160, 92, 160.

2. Darwin, Origin of Species, 7-17.

3. Darwin, Origin of Species, 74, 88, 92-93, 578-579.

4. Darwin, Variation of Animals and Plants Under Domestication, 2:495-514.

5. Darwin, Origin of Species, 578; Darwin, Descent of Man, 2:369-377.

6. Darwin, Origin of Species, 165, 570; Darwin, Descent of Man, 2:378.

7. Dupree, Asa Gray, 44-45, 220-221; McGiffert, "Christian Darwinism," 5-9, 25-26, 41-52; Moore, Post-Darwinian Controversies, 269-270.

8. Gray, Darwiniana, 84-86. See also Dupree, Asa Gray, 269-270, 288; Moore, Post-Darwinian Controversies, 207-209, 271-272.

9. Gray, Darwiniana, 148, 157, 154-155. See also Dupree, Asa Gray, 296-297; McGiffert, "Christian Darwinism," 208-209; Moore, Post-Darwinian Controversies, 274.

10. F. Darwin, Life and Letters of Charles Darwin, 2:80, 146, 170, 105.

11. Darwin, Variation of Animals and Plants Under Domestication, 2:514-515.

12. Darwin, Variation of Animals and Plants Under Domestication, 2:515-516.

13. Darwin, Variation of Animals and Plants Under Domestication, 2:516; F. Darwin, Life and Letters of Charles Darwin, 2:267; Gray, "Variation of Animals and Plants Under Domestication," 236; J. Gray, Letters of Asa Gray, 2:562.

14. Gray, "Charles Robert Darwin," 81; F. Darwin, Life and Letters of Charles Darwin, 2:367.

15. Aubrey Moore, quoted in Moore, Post-Darwinian Controversies, 265; Wright, "Divine Method of Producing Living Species," 454.

16. Himmelfarb, Darwin and the Darwinian Revolution, 349; McGiffert, "Christian Darwinism," 205; Young, Darwin's Metaphor, 111.

17. Ospovat, Development of Darwin's Theory, 6-38; Russell, Form and Function, 1-88; Ruse, Darwinian Revolution, 148.

18. Darwin, Origin of Species, 253; Gray, Darwiniana, 52-53. See also Darwin and Seward, More Letters of Charles Darwin, 1:387; Dupree, Asa Gray, 358, 382; Gray, Darwiniana, 356-357; Ospovat, Development of Darwin's Theory, 115, 148-151; Russell, Form and Function, 234-235, 239.

19. Huxley, Collected Essays, 2:86. See also Huxley, Collected Essays, 2:109-110; Ospovat, Development of Darwin's Theory, 9, 22-23; Ospovat, "God and Natural Selection," 186; Russell, Form and Function, 241.

20. Dupree, Asa Gray, 382. See also F. Darwin, Life and Letters of Charles Darwin, 2:165; Darwin and Seward, More Letters of Charles Darwin, 1:160; de Beer, Charles Darwin, 169; Dupree, Asa Gray, 339-340; Ghiselin, Triumph of the Darwinian Method, 155-158; Moore, Post-Darwinian Controversies, 270, 276.

21. F. Darwin, Life and Letters of Charles Darwin, 1:280, 283-284, 278-279. See also Darwin and Seward, More Letters of Charles Darwin, 1:191-192.

22. Darwin and Seward, More Letters of Charles Darwin, 1:126; F. Darwin, Life and Letters of Charles Darwin, 2:138; Darwin and Seward, More Letters of Charles Darwin 1:271, 208, 128,

145; F. Darwin, Life and Letters of Charles Darwin, 2:217. See also F. Darwin, Life and Letters of Charles Darwin, 2:9, 110, 182; Darwin and Seward, More Letters of Charles Darwin, 1:154, 161, 193, 213, 388-389, 395; Gillespie, Charles Darwin and the Problem of Creation, 132; Young, Darwin's Metaphor, 101-110.

23. Ospovat, "God and Natural Selection," 185.

24. Darwin and Seward, More Letters of Charles Darwin, 1:194, 191; F. Darwin, Life and Letters of Charles Darwin, 2:97, 105. See also F. Darwin, Life and Letters of Charles Darwin, 1:283-284; 2:146, 170, 245, 267; Darwin and Seward, More Letters of Charles Darwin, 192-193, 321; Gillespie, Charles Darwin and the Problem of Creation, 125; Hull, Darwin and His Critics, 62-64; Mandelbaum, "Darwin's Religious Views," 369-370; Ruse, Darwinian Revolution, 250.

25. F. Darwin, Life and Letters of Charles Darwin, 2:97, 174, 7. See also Darwin and Seward, More Letters of Charles Darwin, 1:154; Gillespie, Charles Darwin and the Problem of Creation, 121-122; Gruber, Darwin on Man, 211-212; Hull, Darwin and His Critics, 49-54.

26. Darwin, Origin of Species, 165-166; Darwin and Seward, More Letters of Charles Darwin, 1:194; Hull, Darwin and His Critics, 66; Huxley, "Reception of the 'Origin of Species'," in F. Darwin, Life and Letters of Charles Darwin, 553.

27. Darwin, Variation of Animals and Plants Under Domestication, 2:515; Darwin and Seward, More Letters of Charles Darwin, 1:395. See also F. Darwin, Life and Letters of Charles Darwin, 2:105, 245; Darwin and Seward, More Letters of Charles Darwin, 1:191.

28. Manier, Young Darwin and His Cultural Circle, 117-123. See also Gillespie, Charles Darwin and the Problem of Creation, 106; Himmelfarb, Darwin and the Darwinian Revolution, 348; Mandelbaum, "Darwin's Religious Views," 370.

29. F. Darwin, Life and Letters of Charles Darwin, 1:285, 282; Darwin and Seward, More Letters of Charles Darwin, 1:321; F. Darwin, Life and Letters of Charles Darwin, 2:105-106. See also F. Darwin, Life and Letters of Charles Darwin, 1:283-284; 2:97-98, 146, 169-170, 247; Darwin and Seward, More Letters of Charles Darwin, 1:395.

30. Bowler, Evolution: History of an Idea, 211; Ghiselin, Triumph of the Darwinian Method, 153-159; Gillespie, Charles Darwin and the Problem of Creation, 84; Gruber, Darwin on Man, 213; Hull, Darwin and His Critics, 65; Irvine, Apes, Angels, and Victorians, 108-111, 175; Mandelbaum, "Darwin's Religious Views," 369-374; Ospovat, Development of Darwin's Theory, 30-33, 61, 72-73, 84, 225-226; Ospovat, "God and Natural Selection," 188-193; Young, Darwin's Metaphor, 101-105.

CHARLES DARWIN ON THE TELEOLOGY OF EVOLUTION

by
Jonathan Wells
Advisor
International Religious Foundation, Inc.
New York, New York

BIBLIOGRAPHY

Bowler, Peter J. Evolution: The History of an Idea. Berkeley: University of California Press, 1984.

Darwin, Charles. The Descent of Man and Selection in Relation to Sex. 2 vols. New York: D. Appleton, 1871.

———. On the Origin of Species by Means of Natural Selection: or the Preservation of Favoured Races in the Struggle for Life. 5th edition. London: John Murray, 1869.

———. The Variation of Plants and Animals Under Domestication. 2 vols. New York: Orange Judd, 1868.

Darwin, Francis, ed. The Life and Letters of Charles Darwin. 2 vols. New York: D. Appleton, 1887.

Darwin, Francis, and A. C. Seward, eds. More Letters of Charles Darwin. 2 vols. New York: D. Appleton, 1903.

de Beer, Gavin. Charles Darwin: Evolution by Natural Selection. 1963. Reprint. Westport, Connecticut: Greenwood Press, 1976.

Dupree, A. Hunter. Asa Gray, 1810-1888. Cambridge, Massachusetts: Harvard University Press, 1959.

Ghiselin, Michael T. The Triumph of the Darwinian Method. Berkeley: University of California Press, 1969.

Gillespie, Neal C. Charles Darwin and the Problem of Creation. Chicago: University of Chicago Press, 1979.

Gray, Asa. "Charles Robert Darwin." Nature 10 (1874): 79-81.

———. Darwiniana. New York: D. Appleton, 1876.

———. "Variation of Animals and Plants Under Domestication." The Nation 6 (March 19, 1868): 234-236.

Gray, Jane Loring, ed. Letters of Asa Gray. 2 vols. New York: Burt Franklin, 1973.

Gruber, Howard E. Darwin on Man. 1974. Reprint. Chicago: University of Chicago Press, 1981.

Himmelfarb, Gertrude. Darwin and the Darwinian Revolution. 1959. Reprint. New York: W.W. Norton, 1968.

Hull, David L. Darwin and His Critics. 1973. Reprint. Chicago: University of Chicago Press, 1983.

Huxley, Thomas Henry. Collected Essays. 9 vols. London: Macmillan, 1893-1894.

Irvine, William. Apes, Angels, and Victorians. New York: McGraw-Hill, 1955.

McGiffert, Michael. "Christian Darwinism: The Partnership of Asa Gray and George Frederick Wright, 1874-1881." Ph.D. diss., Yale University, 1958.

Mandelbaum, Maurice. "Darwin's Religious Views." Journal of the History of Ideas 19 (1958): 363-378.

Manier, Edward. The Young Darwin and His Cultural Circle. Dordrecht, Holland: D. Reidel, 1978.

Moore, James R. The Post-Darwinian Controversies. Cambridge: Cambridge University Press, 1979.

Ospovat, Dov. The Development of Darwin's Theory. Cambridge: Cambridge University Press, 1981.

_____. "God and Natural Selection: The Darwinian Idea of Design." Journal of the History of Biology 13 (1980): 169-194.

Ruse, Michael. The Darwinian Revolution. Chicago: University of Chicago Press, 1979.

Russell, E. S. Form and Function. 1916. Reprint. Chicago: University of Chicago Press, 1982.

Wright, George Frederick. "The Divine Method of Producing Living Species." Bibliotheca Sacra 33 (1876): 448-493.

Young, Robert M. Darwin's Metaphor. Cambridge: Cambridge University Press: 1985.