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DR. JULIAN HUXLEY ON EVOLUTION

IN September 1942 appeared a book by Dr. Julian Huxley, F.R.S., entitled: *Evolution: The Modern Synthesis*, containing 645 pages, including a bibliography of 36 pages. This book, although containing many up-to-date facts and observations, has the defects which mar almost every recent book on biology, with an additional defect of its own.

These almost universal defects are: (1) Treating as established fact the theory of organic evolution—that all existing kinds of plants and animals, including man, are modified descendants of one-celled ancestors; (2) Setting forth only those facts which seem to favour the theory, or are not clearly opposed to it, and ignoring all that are opposed to it; (3) Accepting as proved transformations of animals which in fact are impossible. The extra defect, which is less universal, is that the eclecticism of Dr. Huxley's book is not confined to facts but extends to causes. Thus on page 457 we find the following: "How has adaptation been brought about? Modern science must rule out special creation and divine intervention." Thus Dr. Huxley deliberately puts blinkers on science! To rule out special creation as an explanation of adaptations is to degrade Biology from the status of science to that of Gilbertian comedy. Having ruled out special creation because he dislikes it, Dr. Huxley forthwith upbraids Mr. Bernard Shaw because the latter, disliking the idea of a blind mechanism such as natural selection underlying evolutionary changes, asserts that such a blind mechanism cannot be operative. Says Dr. Huxley: "*Pace* Mr. Shaw, this reasoning does not commend itself to scientists." Thus it would seem that the scientist, but not the layman, may rule out what he dislikes!

Dr. Huxley unconsciously justifies the assertion that by ruling out special creation he reduces Biology to comedy, by citing (pp. 428-430) cases of adaptation which could not possibly have arisen gradually by selective adaptation. He writes: "The total range of these functional devices is very large and (once the hypothesis of creation is ruled out) they can only be ascribed to accurate selective adaptation." From this it follows that, by ruling out creation, we are not only forced to credit the

unproved, but even the fantastic, in the name of his so-called "science".

As a field ornithologist I am convinced that many of the nest-building instincts cannot have originated as the result of natural selection. Apart from elaborate nests, such as those of the tailor-bird and the weaver, there is the familiar nest of our house martin. I beg all who are not acquainted with Gilbert White's account of the craftsmanship of this little workman to read Letter XVI (to Daines Barrington) of *The Natural History of Selbourne*. Dr. Huxley believes that this bird is derived from some kind of reptile. As this hypothetical ancestor presumably did not construct a saucer-shaped nest of mud or clay and attach it to the side of a cliff or the limb of a tree, Dr. Huxley must believe that natural selection gradually developed this habit. I challenge him or anyone else to describe in detail possible stages between a nest scraped in a hole in the ground and one composed of a mud saucer attached to a cliff and big enough to hold the eggs and the mother bird.

Dr. Huxley's book has been written with the object of reviving and elaborating the theory that all the transformations of animals and plants postulated by the evolution theory are the result of natural selection in its various forms. As natural selection is supposed to be the outcome of a continual struggle in which the weak or the unfit perish and the strongest or fittest survive long enough to leave offspring that inherit their qualities, it might have been expected that one of the earliest tasks which the adherents of that theory set themselves would have been to discover the extent to which the causes of mortality in nature discriminate between members of each species. But very little has been done in this connection, and I can find no mention in Dr. Huxley's book of any of the observations of those who have studied the matter. Dr. Huxley thus deals with it (p. 17): "We require many more quantitative experiments on the subject before we can know accurately the extent of non-selective elimination. Even a large percentage of such elimination, however, in no way invalidates the selection principle from holding for the remaining fraction." But is there such a fraction? If mortality in nature were not almost entirely a matter of chance every individual would, being unable to compete with adults, be killed off before it reached maturity. According to Dr. Huxley (p. 56), Professor J. B. S. Haldane estimates that

ordinary natural selection involving a single dominant with a selection advantage of 1 in 1,000 will take nearly 5,000 generations to increase the proportion of the dominant from 1 to 50 per cent. Presumably some 50,000 generations would be required to raise it from .1 to 50 per cent. But one has to be wary in applying mathematics to biology. For example, if one man working 8 hours a day can build a 40-yard wall in 6 days, can we infer that 1,000 men would do this in less than 3 minutes?

No matter how potent it may be, natural selection can only act on variations or mutants which occur in organisms; so its action is of necessity limited by the extent to which mutations in any given direction can be piled one upon the other in the course of successive generations. Darwin assumed that there is practically no limit to the extent of this accumulation, and that in course of time the descendants of an amoeba might become elephants, turtles, starfish, etc. He assumed this despite his knowledge of the fact that, although practical breeders have produced many varieties of the animals on which they operated, by breeding from individuals which varied in the desired direction, the final products of their work upon poultry remained poultry, horses remained horses, and pigeons pigeons. None of these creatures showed any tendency to develop into different types of animals. His justification might have been that practical breeders were not concerned with producing new types, but wished to improve existing ones. But this plea no longer holds. Scores of geneticists (i.e. scientific breeders) have been endeavouring to produce new types of animals and plants by experimenting with forms that have many broods yearly. Their efforts in this direction have completely failed. Like the earlier breeders, they have raised many varieties, but have not changed any plant or animal into one of another kind. Over 400 different varieties of the fruit-fly *Drosophila melanogaster* have been produced, but all are clearly *Melanogasters*.

Recent experimental work has, indeed, revealed the great stability of species. Pearl Raymond describes (*Journ. Wash. Acad. Sci.*, vol. 25, 1935) how for over 15 years he tried in vain to alter one of the determiners of heredity known as genes. To this end he bred no fewer than 300 generations of *Drosophila melanogaster*. Had man been the subject of such investigations they would have had to extend over about 9,000 years to include as many generations. He began by crossing a normal fly with a

laboratory-produced specimen known as vestigial because its wings are replaced by mere stumps. This peculiarity is associated with a single gene (factor determining heredity). All the offspring of this crossing had normal wings, the normal being dominant to the vestigial. The offspring were then mated with pure vestigial flies. About half the offspring of this cross had normal wings and half vestigial, in accordance with Mendel's law. All the vestigials were destroyed, but the normal-winged flies were mated with pure vestigials with the same result and the vestigial offspring were killed off and the others mated with pure vestigials; the same result followed, and continued to do so as long as the experiment lasted, i.e. for 300 generations. Half the 300th generation were normal flies. The only gene for normal wings that had ever been in the system was the one contributed by the single wild-type fly with which Raymond started; all the subsequent flies having normal wings had these because of that one ancestor at the beginning of the 300 generations. In the words of Raymond, "The demonstration of the inherent ability of heredity that this experiment has shown is extremely impressive". Dr. Huxley does not mention this experiment in his book.

The number of these genes—these influencers of heredity—in every individual is large. There are perhaps 5,000 in a *Drosophila*. They are located in, or may be parts of, the chromosomes. They seem to be to the living organism what the atoms are to chemical compounds. Are they as unchangeable as chemical atoms? The majority of biologists think they are not; a few think they are. One of the latter is the Swedish plant-geneticist Heribert Nilsson, who in his paper (not mentioned in Dr. Huxley's book), "The Problem of the Origin of Species since Darwin" (*Hereditas*, vol. XX., 1935) writes: "The individual is constituted of hereditary units . . . called genes, which are as supreme and as unchangeable as the atoms of Chemistry . . . On what does heredity depend? It depends on the transmission of a certain hereditary unit, a certain gene, to the offspring. On what does variation depend? It depends on the regrouping of the different genes of the father and mother . . . Variation is caused by the re-combination of the genes, not by their change. Variation is therefore restricted by the combination possibility of the genes. And these are limited by the crossing possibilities. Then again, since individuals belonging to different species of plant

or animal cannot even be paired, much less produce offspring, the combination of variations is confined to the species. Variants are formed, out-crossed and arise anew in a kaleidoscopic sequence WITHIN the species. BUT THE SPECIES REMAINS THE SAME SPHERE OF VARIATION. The various species will remain like circles that do not intersect. SPECIES ARE CONSTANT." The biological species of which Nilsson speaks are by no means always those of the taxonomist based on form. If Nilsson be right, the theory of evolution is impossible.

Dr. Huxley, while admitting that in many respects the genes are like chemical atoms, asserts (p. 51) that they can be "altered by some kind of mutation", and that "gene-mutation, though a rare event, appears to account for most that is truly new in evolution". I submit that there is no PROOF that gene-mutation takes place. Where is the evidence that a mutation in an individual is the result of a change in the gene itself and not of a difference in its expression due to a new combination of interacting genes? Dr. Huxley says: "the gene itself can only alter by mutation but its expression can be affected in a number of ways." I can find no proof that any of the new forms which appear in nature, or are produced by breeders and geneticists, are not the result of changes in the expression of genes. We know, in the words of Dr. Huxley, that "a gene can exist in a great variety of allelomorphic forms (alleles), up to a dozen or more being known in single loci". This fact and the many opportunities for change in the location of genes in the course of the divisions of the generative cells before, during and after their union—in which inversion, crossing-over, duplication, addition, subtraction, etc. may occur—seem to suffice to cause all the mutations known to occur, without invoking an imaginary change in the gene itself.

But incredible changes in the genes are required to account for what Dr. Huxley calls "long-range evolutionary trends". He includes in the term "evolution" (1) "Long-continued trends as revealed by indirect evidence and in some cases by the immediate data of fossils", and (2) "Minor systematic changes as revealed by detailed taxonomy, cytology and genetics". The latter are shown by breeding experiments to be possible, the former are not; indeed they involve transformations which, if ever effected, can have been so only by miraculous

divine intervention. Nevertheless Dr. Huxley firmly believes that Natural Selection did actually bring them about. He writes (p. 40) regarding the small bones of the human middle ear, that they "are derived from the inner portion of the upper jaw, the lower jaw and the hyoid arch which have changed their function in the course of evolution". He thus firmly believes that in the distant past some enterprising reptile scrapped the original hinge of its lower jaw and replaced it by a new one attached to another part of the skull. While this was going on, five of the six bones on either side of the lower jaw broke away from the sixth, which thenceforward formed the whole of its half of the lower jaw. Three of the detached bones, together with the bone to which the jaw had been hinged, forced their way into the skull and two of them entered the middle ear. All this was effected by natural selection; but neither Dr. Huxley nor any other transformist has told us how the unfortunate animal contrived to eat or hear while its skull and jaw underwent these drastic alterations!

Dr. Huxley writes (p. 489): "From the small and generalised terrestrial forms of the Cretaceous and the very beginning of the Cenozoic, lines radiated out to take possession of different environments. Two quite separate lines became fully aquatic, one of flesh-eaters culminating in the whales and porpoises, the other of herbivores leading to the sea-cows and manatees . . . The bats meanwhile specialised on aerial life." That slow-working wizard Natural Selection is supposed to have effected these transformations. Needless to say, they never happened gradually, for the sufficient reason in the case of the whales and the manatees that their forebears, at the half-way stage between them and their land ancestors, would have had a hipbone too small to serve as a base on which the hind legs could articulate, but too great to permit the muscles that move the great tail of the whale or the manatee to be attached to the backbone, so that they could neither walk nor swim properly. I have repeatedly challenged evolutionists to describe or draw a sketch of such a monstrosity. The challenge has not been accepted. Needless to say, fossils of such creatures have not been found; nor will they ever be found. As Vialleton remarked, to look for such fossils is an illusion. Equally ridiculous is the idea that a quadruped became gradually converted into a bat. The earliest fossils of bats are fully-formed bats, just as those of Cetacea

and Sirenia are fully adapted to aquatic life. "Evolution," (writes Dr. Huxley, p. 371), "consists in the accumulation and integration of very numerous and mostly small genetic changes." Consider the number of gene mutations necessary to convert a small quadruped into a whale, a sea-cow or a bat,—yet all these, according to Dr. Huxley, took place between the end of the Cretaceous and the middle of the next geological period, for in middle Eocene rocks fossils have been found of bats, Sirenia, and two of the three orders of Cetacea.

Assertions, such as the above, regarding the origin of man, the Cetacea, Sirenia and bats are not peculiar to Dr. Huxley's book; they are to be found in almost every biological treatise and text-book, besides popular books and articles written during the past seventy years. Owing to constant repetition they have become a matter of belief to most biologists and to many who are not biologists, including the clergy. But the question arises, how came these assertions into scientific books? The answer is, I believe, that it was because a number of biologists early adopted evolution as a religion—an anti-Christian religion—and in their zeal to propagate it, they failed to distinguish between their beliefs and established truths. These worthies exist to-day, and are very vociferous. In an article in the March issue of *The Nineteenth Century and After*, the Editor writes of Dr. Huxley's *Evolution: The Modern Synthesis*, that the author of this book "while simulating scientific detachment, suppresses or misrepresents every serious critic, thus giving his readers thoroughly biassed and misleading notions about the present state of biological science. More than this, he exploits scientific Darwinism so as to make propaganda for his own obscurantist and unscientific—indeed anti-scientific—'Religion of Progress'".

Camberley, Surrey.

DOUGLAS DEWAR.