

Natural Selection and Natural Theology

I READ with interest, in NATURE, vol. xxvii. p. 362, the reply made by Dr. Romanes to a letter of mine which, although not originally addressed to a scientific organ, found hospitable reception in your columns. It was not much out of place there, for it was essentially an inquiry whether certain inferences may or may not *scientifically* be drawn from certain premisses. I am not wholly without hope of making it clear that the criticisms which I ventured to bring forward are grounded in reason; and confining my rejoinder strictly to the issue joined, I may hope not to be long nor very tedious. Let me trust that no curtness of statement will imply any want of the great respect which I entertain for an able investigator and writer, whose view may be imperfectly apprehended, or may bear an interpretation I should accede to.

The issue is a narrow one, and there is no need to widen it. Dr. Romanes is understood to derive from scientific premisses the conclusion that evidence of design is not legitimately derivable from the structure and adaptations of plants and animals, and, more particularly, that the theory of natural selection has destroyed the evidence of special design in organic nature, so that now the facts of organic nature furnish no other and no better evidence of design than do the facts of inorganic nature.

The first of these conclusions was derived from the proposition that there is no point of logical contact between natural science and the idea of design, wherefore no inference can legitimately be carried from the facts of the one to the conceptions of the other. I suggested that the maintainer of that position could not consistently argue that a particular scientific theory has annihilated an inference admittedly beyond its logical range. The reply is that, "If a man believes that there is no logical connection between one thing and another, I do not understand why he should be deemed inconsistent because he endeavours to show the fictitious character of the logical connection which has been erroneously supposed to exist." But the point of the objection was that, while insisting that any inference from the one to the other was invalid from the nature of the case, he actually inferred that certain scientific facts and theories completely overthrow and destroy the theory of particular design in organic nature. This may be. Only one would think that whatever may be legitimately overthrown may be as legitimately supported.

Moreover, if I rightly understand, there was not long ago a legitimate ground of inference (whether scientific in the narrower sense or philosophical need not here be inquired) from organic nature to design. "For it would be proof positive of intelligent design if it could be shown that all species of plants and animals were created"; and therefore proof presumptive while the theory of special creation was accepted and probable. At least—and this is the point—the argument from structure and adaptation to design was then admissible and even cogent.

Now, from the scientific side, upon which we are standing, special creation means only that the forms were scientifically inexplicable, and to be taken as original; their adaptations to their surroundings and their relations of means to ends in themselves equally as primary endowments. And whatever evidences

of intellectual origination these manifested, *were seen in the things themselves*, and we suppose are to be seen there still. The inference was not one from an intellectual originator to design in the organic world, but from marks and operations in the latter which indicated design to an intellectual originator. The inference to most minds was convincing; at least it was legitimate. The recognised laws and operations of nature—a better knowledge of which has destroyed so many crude notions—were not thought to interfere with it.

It used to be so, but we have changed all that. How?

First, by the declaration of the principle that the facts of organic nature, in all their multiplicity and variety, yield no other and no better indications of design than do any of the facts of inorganic nature. That is to say, a stratum no more than a structure, a crystal than a chrysalis, living things and their responses than lifeless things simply acted upon, things which are intelligible only when contemplated as means and ends, no more than things of which ends are predicable, if at all, only by remote implication. Not only is the one as good as the other, but any one is said to be as good as all. Because of "the universal prevalence of laws and sequences of cause and effect, . . . they are not really or logically strengthened by a mere enumeration of particular instances. . . . The so-called law of causation as a whole being known, and its universality recognised, its true argumentative value to the theory of theism is not influenced by the explicit formulation of any number of its specific cases."

Here "law of causation," or the way how something comes to pass, is mixed up with "evidence of design," or what it was for. And we are to conclude that the immense variety and multiplicity of adaptations of particular means which accomplish particular ends in organic nature bring no contributory and cumulative evidence as to there being any design in them. In palliation of the charge of "damnable iteration," to which the teleologists are thus exposed, it may be pleaded that, although possibly one good witness or one good observation may be as convincing as many for certifying a fact, surely the more and the more varied the better for proving an underlying intervention—of which the evidence must always be circumstantial, and the conclusion a judgment or belief.

The old belief that adaptation of means to ends in plants and animals gives evidence of intellectual origination, had not been seriously unsettled by the scientific belief of the universality of the law of causation. It remains to be seen whether it will survive the establishment of the belief that the forms in which these adaptations are recognised have themselves been slowly evolved and diversified in a way that is partly explained by the doctrine of natural selection; and this is the gist of the question.

Dr. Romanes thinks that we have, in natural selection, "a cause other than intelligence competent to produce the adaptations," one which supersedes intelligence by working gradually. For, "if the adaptations have been effected gradually, and by the successive elimination of the more favourable variations by a process of natural causation, we clearly have a totally different case to contemplate, and one which is destitute of any evidence of special design." "The progressive adaptations of structures to functions by such a purely physical cause as natural selection, when once clearly revealed, must destroy all special or particular evidence of design, even supposing such design to exist." This phrase, "such a purely physical cause as natural selection," and the preceding phrase italicised by its author as specially significant and as being its equivalent, show that the term is used in its strict sense. So the substitute for intelligence, that which is said to account for all the adaptations in living nature, is the successive destruction of the less favourable variations by natural causes, leaving the most favourable to survive! Here "we clearly have a totally different case to contemplate, and one which is destitute of any evidence of special design,"—equally destitute, one would say, of any pretensions to act as its substitute until it is explained how the physical destruction of a part should have set the rest into varying at all, into varying advantageously, and into varying into the very special ways they have done. Not till this, or something like it, is done, can natural selection pure and simple claim to give scientific explanation of the adaptations and the forms at whose birth it has assisted.

When I before insisted that "to make the purely physical explanation tenable it must be shown that natural selection scientifically accounts for the adaptation," and that it has not done this, that no reasons have been given why the organisms

must have responded in the ways they do, or have responded at all to the environment, I meant only that the theory ought to fulfil the conditions which other physical theories are bound to satisfy, *i.e.* to account for the principal facts of the case. I had no reference to any subsidiary hypothesis which might help the matter. Dr. Romanes rightly says that it lies not with the evolutionist to show that variations may not have been intellectually planned or guided. But when he assigns the whole results to known physical causes and discards the factor of intelligence, he is bound to render their adequacy at the least conceivable.

It may now be seen, I trust (and the context might have made it clear), that, in asking Dr. Romanes if he was quite sure that any other cause than intelligence could adapt organisms to their environment gradually, I was not inviting him to guesses "about the possibilities of supernatural creation," but to a reconsideration of his antithesis between special (and as he will have it, sudden) creation, requiring intelligence, and gradual evolution, which might dispense with it; and I was intimating that he had not shown how the latter could dispense with it. The problem was: Given plants and animals with certain structures and certain adaptations to their environment, to be changed into other forms with other structures equally well adapted to a more or less changed environment, how to do this solely by the action of said environment. Answer: By the killing out of all which have not somehow or other acquired the particular structure and adaptation they needed.

But now comes an important qualification: "The evolutionist may freely admit that natural selection has probably not been the only physical cause at work, and even that the variations supplied to natural selection may not have been wholly fortuitous, but may have occurred along favourable lines as responses of the organisms to their physical surroundings"; and Dr. Romanes calls my attention to a statement of his that it may be so in an essay which I regret that I have not read. He continues, however: "But such admissions would make no change in the logical aspect of the case; for, however many supplementary causes of this kind we may choose to imagine as possible, the evolutionist is bound to regard them as all alike in this: that they are of a physical or natural kind."

"Physical or natural kind." The agency which explained away all implication of design was in the strict sense physical, being the action of the environment on the organisms. It is now extended to whatever is *natural*, that is, to whatever occurs in the course of nature, presumably under established laws; and it is assumed that whatever so occurs is thereby void of all *evidence* of intellectual intention (we need not regard the difference—if any there be in such relations—between general and special design, the question being wholly one about the grounds of any *evidence* of design in nature). To me it is wholly probable that existing species and their special adaptations became what they are in the course of nature. And my argument is that, if "such a purely physical cause as natural selection" leaves these adaptations still unaccounted for, whatever implication of designed origination there formerly was still holds, and may hold, although the series of natural causes be practically endless.

Then as to such causes being all of a piece, so that pure physics may explain all biology. Doubtless in a certain sense all nature is of a piece. But in another sense—the very one we are concerned with—it is of at least two pieces; no matter how it came to be so. One of them is pervaded by an element of its own—that of *direction of action to ends*—which is more and more manifested as we rise in the scale of being, but is characteristic of all organisms. That seems to lay a foundation for a difference in the quality of the "inference which can be drawn by the human mind [*quoad* design] from the province of natural science." This difference might have made Dr. Romanes hesitate to draw, from scientific premisses, the downright conclusion that "the facts of organic nature present no evidence of design of a quality other or better than any of the facts of inorganic nature."

Here lies our whole contention. We agree that natural science leaves aside the question whether evolution and design in nature are compatible or not, this being only a phase of the enigma which was as puzzling before evolution was dominant as it is now. We suppose, too, that the difficulty of conceiving how design can coexist with the natural evolution of organisms is fairly balanced by the difficulty of conceiving how the phenomena of organic nature can be accounted for without it. The point which we have laboured over is that, if science has no call to settle the question, it has none to prejudge it. It was only

because Dr. Romanes seemed to me unwittingly to have done so, that I ventured the criticisms which opened this discussion.

Cambridge, Mass., U.S.

ASA GRAY

P.S.—A brief note upon Mr. Hannay's letter, *NATURE*, vol. xxvii. p. 364, referring to my supposition of successive generations slowly changing, "*yet always so as to be in compatible relations to the environment.*" He remarks, this "is just such a statement as 'Design' would require, but cannot be held by scientific evolutionists, otherwise why are there so many extinct species?" Surely it could be held by the soundest of evolutionists, for it is of the very essence of Darwinism. Are not the individuals which compose the present fauna and flora in compatible relations to the environment, and is not the extinction of species going on? In human society do we consider that the unmarried and the childless members of the community are not in compatible relations to their surroundings? Is there any reason to suppose that the individuals of a flora of earlier times—say of the Miocene—were not on the whole in as orderly and compatible relations as the existing flora is? It is not *chaos* but *cosmos* that true Darwinism has in mind, common though the contrary impression be.

A. G.