

# ON THE DARWINIAN HYPOTHESIS OF THE ORIGIN OF SPECIES.\*

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## INTRODUCTORY.—ON DEVELOPMENT HYPOTHESES, ANCIENT AND MODERN.

THERE are certain phenomena in the animal and vegetable kingdoms which appear so evidently, on a partial investigation, to point to a doctrine of continuity of forms, that we cannot be surprised to find that the very earliest Greek naturalists had adopted it, and were wont to speculate upon it. Having some slight knowledge, moreover, of embryology and the simpler modes of animal metamorphosis, it was a natural assumption by them that all organic life formed one continuous chain from the simplest organisms up to the most complex, man himself, and that all were evolved from each other according to a great scheme of development. Thales† was probably the first to speculate on the origin of life, and some of his disciples even attempted to discuss the problem of development. But till the time of Empedocles, who lived in the middle of the fifth century B.C., nothing satisfactory or properly scientific was done in natural science; and his hypothesis of development is the only one worthy of our notice in ancient times. In many of his speculations, moreover, he has anticipated modern views: and indeed it is difficult to trace any subsequent actual advancement in several of the ambitious later attempts of the developmentists. An analysis of his system is therefore desirable.

He was the first to state the doctrine of the four elements—fire, air, earth, and water. He held, further, that there were two principles or moving powers in nature—the combining and dissolving principles, or, as otherwise stated by him, love and war, harmony and discord. Out of the action of these principles or forces upon the four eternal indivisible elements the myriad forms and combinations of nature have sprung.

\* *The Variation of Plants and Animals under Domestication.* By CHARLES DARWIN, M.A., F.R.S., &c. John Murray, Albemarle-street, London, 1868.

† About 600 B.C.

He considered plants to be lowest in the scale of organic life, and he appears to have regarded them as spontaneously generated by inorganic matter. They developed into the simpler forms of animal life, and these again into the more perfect and complex, till at length man was evolved. He taught that the scales of fish and feathers of birds were analogues, and, moreover, the same in origin, being differently modified in different elements; that the spine was broken up into vertebræ by the movements of the fœtus, and that plants had sexes and some degree of sensation. These and similar views of his merit for him the name of the first philosophic naturalist.

All the Greek developmentists enunciated schemes of necessary and inherent evolution, and everything added to their hypothesis in modern times is entirely of an accessory and supplementary character. No new facts have been discovered in connection with *organic* development which can throw any further light on the subject or bring the general hypothesis nearer the probability or even possibility of demonstration. The doctrine of spontaneous generation is still not only problematic, but even the bulk of facts points to the opposite tenet. No instances of permanently arrested or indefinitely continued metamorphosis have been noticed. The whole question of organic development still rests in the mysticisms of materialism, and is likely there to remain.

It cannot, however, but be of some interest and importance to notice the principal modern theorists of the same school, as it is impossible to do the Darwinian Hypothesis justice in its unique originality and exclusive pretensions, without knowing the precise stage in the history of the whole controversy on Evolution when Darwin's speculations come in.

De Maillet, who published in the beginning of the 18th century, was the first noticeable modern developmentist. From discovering fossils inland in rocks he naturally concluded that the sea was retiring from the land. He considered the sea the theatre of the first stage in creation, and he endeavoured to show how marine plants and animals, when left high and dry by the receding waters, became terrestrial plants and animals. For example, a fish split its scales into feathers, and metamorphosed its anterior and posterior fins into wings and feet. His *Natural History of the Development of Man* is quite different from the advanced views of recent speculators, but to our mind quite as plausible. Man's first element was of course the sea, in which he afterwards became a fish, then a merman. Thereafter, we suppose, a merman and mermaid, being desirous of leaving

their native element, cast their scaly coat, and wriggled off their paddle tails, and took to dry land. There is necessarily very little scientific merit in all this.

As an instance of retrogressive development, the following story of this naturalist's is even sensational. Dutch sailors captured on one occasion a merman, and, on quizzing him, found he could speak real *Hollandsche*. He thereafter proclaimed his full fraternity and fellow-feeling by asking for a pipe! All this was, however, fully accounted for when he related how he had fallen into the sea six years before, and how the process of degeneracy had commenced from the instant of his immersion, scales, &c., &c., following in due course! It is not said what became of him afterwards.

The cosmogony of Lamarck is by far the most complete scheme of organic development. His hypothesis begins with the world in a liquid state. The simpler animalcules were generated in this, and soon produced vast quantities of lime. Hence the origin of the calcareous matter of the earth's crust. Plants were next developed, and they produced clay. Onwards the process of development and spontaneous generation went, side by side with the formation of land and mountains; and as the outcome of the acting and reacting relations of organisms and inorganic matter, new wants, functions, and desires manifested themselves. Wants begot habits, habits instincts, functions created organs, and desires improved organs. Certain animals had to chew hard food, and this function produced teeth. Organs of sensation were created in those animals which required them, by the undefined, blinded instinct for feeling, knowing, and perceiving. Fishes in dark caves, where no light penetrated, had no need of eyes, and, as there was therefore no want to produce them, they accordingly had none. So on throughout this blindly necessitarian system.

Unsatisfactory as these various hypotheses are in accounting for the origin of life, and the marvellous and varied structures of plants and animals as mere organized forms, they are most unsatisfactory in their explanations of the immaterial phenomena of mind and instinct. This weak feature in their character as development theories must have been apparent to all thinkers, especially those interested in the speculations of mental and moral philosophy. At all events, we find side by side with the materialistic developmentists which we have attempted to trace, another class of naturalists, who took up a position considerably elevated above the bathos of unmingled materialism. In ancient times, Straton, a pupil of Theophrastus, the follower of

Aristotle, held that every atom of matter was possessed of sense and unconscious intelligence. Robinet, in modern times, systematized the doctrine of hylozoism; all matter, he believed, was living and sentient. Man was the ultimate effort of nature, and his prototype is the intellectual principle originally latent in matter. Natural phenomena, past, present, and future, are the results of one act, for there is but one plan throughout all. Every form of life is some stage towards man, or is an arrested attempt towards his creation. One step further, and Robinet's system became the German Pantheism.

In Scotland there has been in late years a notable book—*The Vestiges of Creation*. Its style is eminently attractive, and its arrangement is subtle in the extreme. It possesses, however, no real claims to originality, for it may be styled an amended Lamarckian Hypothesis,\* with some additions and details from Laplace and the encyclopædists.

While there is undoubtedly a great similarity between these two schools of development theorists, it must be obvious that their relationship comes ultimately to be that of a pure or modified Materialism to Hylozoism or Pantheism. They are both, moreover, possessed of nearly similar scientific claims, being indefinite and imperfect deductions from certain apparent facts. In the one case we have, as a first and foundation principle, an essence or protoplasmic substance eternally separate, but acting in matter as such, or eternally inherent in it; in the other case we have a *natura naturans*, or potentiality of matter to come in a process of development the *natura naturata*—all the forms and conditions of life, with man as the final effort. We need not say that both of these theories may be matters of belief or not, and even legitimate subjects of philosophical discussion; but they are inadmissible in any scientific discourse, exposition, or hypothesis. We may therefore dismiss them without farther comment.

The Darwinian Hypothesis comes forward with peculiar and definite claims. The author has been perhaps the most laborious, and probably is the most philosophic naturalist of the day, or of perhaps any age. He has discovered a law by which forms become modified and differentiated; and this law does not rest on any vague creed or philosophic

\* The writer has long held the belief that the author of *The Vestiges of Creation* was the late talented Professor of Astronomy in the University of Glasgow, and not Dr. Chambers of the firm of W. and R. Chambers. The style is neither that of Combe nor Chambers, but is eminently that of Dr. Nichol. Of course, this subject cannot be discussed here.

hypothesis, but is a veritable scientific fact. We shall have occasion to question, and shall endeavour to refute his *ultimate applications* of the law of natural selection, as it is named; but that such exists, causing variation and departure from types, cannot be denied. It will be therefore allowed, if this is the case, that in Darwin's Hypothesis we have the first indications of a proper scientific method constructed on a true scientific basis. The previous theories of evolution might very well be considered so many religious systems.

Darwin's reasoning is, moreover, *a posteriori*, not of the nature of *a priori* arguments, as in former hypothesis, and is, therefore, inductive. From considering the law of variation and modification, to which we have referred in its manifest effects, in the hands of man, and even in nature untended by man, he infers that species and even genera have been created through the course of ages by it. Here, however, we must have his own words: \*— "From a remote period, in all parts of the world man has subjected many animals and plants to domestication and culture. Man has no power of altering the absolute conditions of life; he cannot change the climate of any country; he adds no new element to the soil; but he can remove an animal or plant from one soil to another, and give it food on which it did not subsist in its natural state. It is an error to speak of man tampering with nature, and causing variability. If organic beings had not possessed an inherent tendency to vary, man could have done nothing. . . . Scarcely a plant can be named, though cultivated in the rudest manner, which has not given birth to several varieties. It can hardly be maintained that during the many changes which this earth has undergone, during the natural migrations of plants from one land to another tenanted by different species, that such plants will not often have been subjected to changes in their conditions analogous to those which almost inevitably cause cultivated plants to vary. . . . Although man does not cause variability, and cannot prevent it, he can select, preserve, and accumulate the variations given to him by the hand of nature in any way he chooses; and thus he certainly can produce a great result. Man may select and preserve each successive variation with the distinct intention of improving and altering a breed in accordance with a preconceived idea; and by thus adding up variations, often so slight as to be imperceptible by an educated eye, he has effected wonderful changes and improvements. . . . We shall therein

see that all organic beings, without exception, tend to increase at so high a ratio that no district, no station, not even the whole surface of the land, or the whole ocean, would hold the progeny of a single pair after a certain number of generations. The inevitable result is the ever-recurrent struggle for existence. It has been truly said that all nature is at war; the strongest ultimately prevail, the weakest fail; and we well know that myriads of forms have disappeared from the face of the earth. . . . This preservation, during the battle for life of varieties which possess any advantage in structure, constitution, or instinct, I have called natural selection; and Mr. Herbert Spencer has well expressed the same idea by the survival of the fittest. . . . *On the principles here briefly sketched out there is no innate or necessary tendency in each being to its own advancement in the scale of organization.*"

In the last sentence quoted he distinctly denies that his hypothesis is a scheme of organic development; it is an hypothesis of modification and differentiation, and not of evolution and development. No one who examines his views, as enunciated in the extracts we have given, could charge him with holding similar opinions to previous development speculators. They involve a belief in no special philosophic or religious creed. He does not believe in the doctrine of heterogeny or spontaneous generation; indeed, one of his ablest speculations, communicated to the Linnean Society of London, is in refutation of that doctrine. The law of natural selection he considers merely an efficient, or perhaps rather an instrumental, cause in the hands of an All-wise Creator.

If, therefore, it be an adequate and legitimate hypothesis, it can bear on its face no threatenings to the revealed religion, and therefore deserves not the rancour and condemnation of orthodoxy which it has experienced. We shall have occasion in our next communication to find exception to its legitimacy and adequacy, and we shall even attempt, from arguments and data drawn from physical science, to proclaim the impossibility of its ultimate findings. But every sentiment of fair play demands that no fulminations of doctrinal and scholastic conservatism should be directed against his hypothesis in the indefinite belief that it involves a Pantheistic or Materialistic creed for the purpose of alarming untutored and unsophisticated multitudes, and seducing thereby the confidence and sympathy of the generality of mankind from the teaching of nature.