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CHAPTER IV.

Since we have heard the verdict of zoologists and botanists concerning Darwinism, it is but right that we should now listen to a palaeontologist, a representative of the science, which investigates the petrified records of the earth's surface, and strives to collect information regarding the world of life during remote, by-gone ages of the earth. It is evident to every one that the verdict of this science must be of very special importance in passing on the question of the development of living organisms. Darwin himself recognized this at the outset. He and his followers, however, soon perceived that, while the revelations of palaeontology were on the whole favorable to the doctrine of Descent, in so far as they proved the gradual change of organization, in consecutive strata, from the simple to more complex forms, palaeontology revealed nothing that would sustain the Darwinian theory as to the method of that development. As soon as the Darwinians, and first of all Darwin himself, perceived this, they at once brought forward a very cheap subterfuge. Since Darwinism postulates a very gradual, uninterrupted development of living organisms, there must have been an immense number of transition-forms between any two animal or plant species which to-day, although otherwise related, are separated by

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characteristic features. Consequently, on the Darwinian hypothesis, all of these transition-forms must have perished for the singular reason that other better organized forms overcame them in the struggle for existence. If therefore the millions of transition-forms were still missing, and the known petrified forms of older strata of the earth did not reveal them, the Darwinians were able to console themselves until from 20 to 40 years ago, with the assertion that our knowledge was still too deficient, that a more thorough investigation of the earth's surface and especially of out-of-the-way parts would eventually bring to light the supposed transition forms. Such assertion affords very poor consolation, and is anything but scientific. The method of natural science consists in establishing general principles on the basis of the materials actually furnished by experiments and observation and not in excogitating general laws and then consoling oneself with the thought that while our knowledge of nature is as yet extremely imperfect, time will furnish the actual material necessary to substantiate our guesses. But since then many a year has come and gone and Darwinism has caused, and for that alone it deserves credit, a diligent research in every field of natural science, and has promoted among palaeontologists a search for the missing transition-forms. The materials of investigation from the field of palaeontology have also wonderfully increased during these decades. Hence it is worth while now at the dawn of the new century to examine this material with a view to its availableness for the theory of Descent and especially for Darwinism.

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Professor Steinmann has recently done so in Freiburg in Breisgau, on the occasion of an address as Rector of the University. What conclusions did he reach?

Steinmann declares it to be the primary task of post-Darwinian palaeontology "to arrange the fossil animal and plant-remains in the order of descent and thus to build up a truly natural, because historically demonstrable, classification of the animal and plant-world." At the outset it is to be noted that for various reasons palaeontology is unable to execute this momentous task in its full extent. The evidence of palaeontology is deficient, if for no other reason than that many animal organisms could not be preserved at all on account of their soft bodies; many animal groups have, nevertheless, received an unusual increase (mollusks, radiata, fish, saurians, vertebrates, and dendroid plants).

As regards the attempt made in the sixties to draw up lines of descent, Steinmann repudiates, without, of course, mentioning names, the family tree constructed by Haeckel and his associates as wholly hypothetical and hence unjustified; he rightly remarks that their method smacks of the closet. He finds fault with them chiefly because they predicated actuality of this imaginary family-tree and fancied that the historical research of the future would have but isolated facts to establish.

In speaking of the palaeontological research of the last few decades, Steinmann says: "In the light of recent research, fossil discoveries have frequently appeared less intelligible and more ambiguous than before, and in those

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cases in which an attempt has been made to bring the descent-system into agreement with the actual facts, the incongruity between the two has become obvious." Thus, for instance, the well-known archaeopteryx is not, as was maintained, a connecting link between reptile and bird, but a member of a blindly ending side branch. In fact palaeontological research has proven incapable of finding the transitions between different species, clearly determined by the theory. But the overwhelming abundance of matter called for new endeavors to master it. It was then further discovered—Steinmann finds an illustration of this fact in the echinodermata—that the well-known "fundamental law of biogenesis" of Haeckel can be accepted only in a very restricted sense and may even lead to conclusions absolutely false. We desire to remark here that a "fundamental principle" should never mislead; if it does so, it is not a fundamental principle.

It is of importance to know that according to palaeontological investigation, empiric systematizing and phylogenetic classification do not always coincide, as, for instance, in the case of the ammonites. According to palaeontological investigation the great systematic categories are only grades of organization. Hence present day systematizing is being more and more discarded, and the said categories—as indeed also the lesser groups of forms—must be of polyphyletic origin, that is, they must have descended from different primitive stocks. It may be asked: What bearing has this principle of multiple origins? For a long time reptiles were the predominating vertebrates; when mammals

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and birds appeared, numerous, varied and strange saurians inhabited land and sea; but "with the end of the chalk-period most saurians seem to have vanished suddenly from the scene, and soon we behold the mainlands and oceans inhabited by mammals of most diverse kinds." The saurians have become almost extinct and the mammal-tribe suddenly shows a most extraordinary variability and power of development. How is either phenomenon to be explained?

"The disappearance of a group or organisms has been preferably explained since the time of Darwin, by defeat in the struggle with superior competitors. If ever an explanation lacked pertinency, it does so in this case, in which the succumbing group is represented by gigantic and well preserved animal forms, widely distributed and accustomed to the most varied methods of nutrition, whereas the competitor appears in the form of small, harmless marsupials. It would be equivalent to a struggle between the elephant and the mouse."

We acknowledge with pleasure this clear rejection of Darwinism on the part of Steinmann.

Steinmann also rejects the natural extinction of those forms, perhaps from the weakness of old age; whether he is wholly warranted in doing so, seems somewhat doubtful. He tries to explain the phenomenon on the basis of the multiple origin of the mammals; and in fact there is already speculation regarding triple origin, viz: tumbreets, marsupials, and the other mammals. Now if the latter also

possessed a multiple origin, the problem of the extinction of the saurians would, according to Steinmann solve itself. One would not need to consider the number of extinct forms as large as is now done. However, he does not enter upon any closer consideration of this question. But he points out, for instance, that to-day the shells of mollusks (snails and conchylia) are regarded as structures that were acquired only in the course of time for the sake of protection, the disappearance of which, therefore, implied a disadvantage for the respective organisms. This transition would be something extraordinary—"but if on the contrary, one regards the shells as the necessary products of a special kind of assimilation and of the immoveableness of certain parts of the body, the gradual disappearance might well be considered a process which may take place in various animal-groups with a certain regularity in the course of the phyletic development." The snails devoid of shells, for instance, may be derived with certainty from those possessed of shells; this process has very probably also taken place in different genetic lines.

This view is well worth consideration; it stands in sharp opposition, in fundamental principles, to the Darwinian explanation. This calls for special emphasis here. How should one explain the origin of uncrusted mollusks from crusted ones through the struggle for existence, since in such a contest the latter must have had far greater prospect of survival than the former?

This view together with the principle of multiple origin opens up, according to Steinmann, "the prospect of

an altered conception of the process of formation of the organic world." According to the new conception, the many extinct forms of antiquity are not, as Darwin supposed, "unsuccessful attempts and continued aberrations of nature"—how this reminds one of that old, naive, much-ridiculed idea that fossils were models that God had discarded as unserviceable—but would gain new life and assume hitherto unsuspected relationship to the present organic creation.

"Science, which seeks after operative causes, at the beginning of the century regarded creation as a multiplicity of phenomena without any causal connection as to their origin. Darwin taught as a fundamental principle the unity and the causal inter-relation of creation, but was not entirely able to save this hypothesis from a violent and sudden death. In the future sketch creation will appear as wholly restricted in itself and lasting, the causes of its limitation lie, up to the time of the intervention of men, solely in the balanced motion of the planet which it peoples."

At the close of his address Steinmann points out that behind the problem of the manner of development, there stands "the unsolved question regarding its operative causes." "Regarding this point," he continues, "opinions have perhaps never been so divergent as they are to-day. The times have passed when the Darwinian explanations were regarded with naive confidence as the alpha and omega of the doctrine of Descent. Not only are the adherents of Darwinian ideas divided among themselves, but

the theory of Lamarck, somewhat altered, favored by the results of historical investigation, appears more striking and now seems more in harmony with facts than formerly. What is considered by one as the ruling factor in the evolution of organisms is regarded by another as a "quantite negligeeable" or even as the greatest mistake of the century. In this discord of opinions the principle of Descent alone forms the stable pole."

Thus Steinmann, and we can but applaud his conclusions with undisguised pleasure, for they tend throughout in the direction of our anti-Darwinian view, and deal Darwinism another fatal blow. It is also worthy of special note that this time the blow is dealt from the side of palaeontology; for, even if now and again we dissent from Steinmann, in this we fully agree with him that the historical method of considering the evidences of bygone periods of creation is at the very least quite as important for passing correct judgment regarding descent, as is the investigation of contemporary living organisms. Indeed, family-trees were constructed without regard for palaeontology, almost exclusively from an examination of present conditions, and sometimes the author did not even shrink from falsification. This procedure has been bitterly revenged and will take further revenge unless at length a definite end be put to the family-tree nuisance and the respective books instead of being published anew, be relegated to the lumber-room of science, there to turn yellow amid dust and cobwebs—the curious evidence of gross folly. But only have patience, even that time will come.

The conclusions of Steinmann, that are most important for us, may be summarized as follows:

1. The family and transition forms demanded from palaeontology by Darwinism for its family-trees, constructed not empirically but *a priori*, are nowhere to be found among the abundant materials which palaeontological investigation has already produced.

2. The results of the investigation do not correspond with the family groups drawn up according to the so-called "biogenetic principle," which principle has in fact led men of science into false paths.

3. At best, the biogenetic principle has a limited validity, (we add that later it will undoubtedly follow Darwinism and its family trees into the lumber-room).

4. The results of palaeontology, in so far, for instance, as they testify to the sudden disappearance of the saurians and the advent of mammals, everywhere contradict the Darwinian principle of the survival of the fittest in the struggle for existence.

5. "The time has long passed when the Darwinian explanations were regarded with naive confidence as the alpha and omega of the doctrine of Descent."

6. Only the principle of Descent is universally recognized; the "how" of it, its causes, are to-day entirely a matter of dispute.