

The Origin and Evolution of Life

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THE problem of the origin and evolution of life has been and still is fascinating, and its solution is the scientist's highest ideal. Much has been written and said about this problem; theories were put forward, but nothing concrete has been proved. Some blamed the Church, others the materialism of men of science; in fact the problem has been the subject of much bitter controversy.

In such a short space it is only possible to outline broadly some of the theories put forward in favour of evolution, theories which are the outcome of research work by famous scientists. It is not necessary to admit them; we shall try to analyse them and to see what is to be admitted or rejected.

What is meant by the theory of evolution? Evolution supposes that life crept from the sea to the dry land; from fish to reptile, from reptile to bird, and from bird to mammal and so to monkeys and sub-men. This presents several weak points, and although there are many arguments that favour an evolution, there is no way to prove it scientifically. The majority of scientists admit the fact of evolution; the subject of controversy is the how and why it occurred. How was the first man born? Nobody knows. Discussing the resemblance between man and ape in their embryonic stage Sir. P. Chalmers Mitchell writes: "the faces and features, the domed forehead covering the capacious brain, the practical absence of hair, and every minute detail of the internal and external structure, agree with a fidelity that is almost shocking. Professor Metchnikoff was so impressed by such resemblances that he has suggested that the human race may have taken its origin from the precocious birth of an ape."

This is, of course, yet another theory. If we admit an evolution from the lowest animal up to the monkeys, why should we not admit the evolution of man? And if we do, how are we to reconcile ourselves with the first chapter of Genesis: "And God said, Let us make man to our image and likeness: and let him have dominion over the fishes of the sea, and the fowls of the air, and beasts, and the whole earth, and every creeping creature that moveth upon the earth; so God created man in his own image, in the image of God created He him; male and female created He them."

The studies which biologists used in trying to justify evolution are numerous. Georges Cuvier admitted the hypothesis of successive creations which d'Orbigny tried to prove admitting successive geological cataclysms which destroyed the pre-existing animals. But we know today that such cataclysms all the world over did not happen; the transformations of the earth are very slow as they happen in our times.

The study of heredity did not solve the problem although it cleared some points. The variations from one generation to another were shown to be so insignificant that biologists gave up hope of finding a solution by the application of this study.

Lamarck said that evolution was dictated by the use and disuse of organs. He explained his theory by giving puerile examples. He attributed, for instance, the length of the giraffe's neck to the necessity of the animal to eat the leaves of tall trees, and this effect was transmitted to its young. For the possibility of this phenomenon it is necessary to admit the transmission of acquired characters which experiments in heredity deny. Lamarck's theory says that the modifications in an animal produce at length a different kind

of animal, modifications which arise in each individual in the course of its life, by its activity in response to the stimuli it receives from its surroundings. This, of course, is not correct.

Charles Darwin, the prophet of evolution, attributed the cause of evolution to natural selection. The conclusions of the great naturalist are, however, subject to criticism because of the weak points they present. Paleontology, for example, has revealed instances in which a feature continued to evolve even when it ceased to be useful. Another weak point is the rareness of variations of effective magnitude.

Ernst Haeckel, the German biologist, using embryology as a basis for his arguments, formulated his famous law which says that "Ontogenesis repeats Phylogenesis," that is to say, that every individual in his embryonic stage (Ontogenesis) repeats in short the principal stages from which he has passed to be what he is today (Phylogenesis). An egg, for instance, transforms itself into an aquatic animal (tadpole), this loses its tail, and legs appear so that a terrestrial animal is formed (frog).

All these are, however, theories and one dare not admit them unless they are proved to be true. If it is so difficult to prove the passage from a simple form to myriads of complicated and higher beings, how can scientists hope to solve the problem of the origin of life?

A most convenient, but unacceptable, theory was put forward by the Swedish scientist Savante Arrhenius. He explains how life was brought from other planets by germs impelled by the pressure of light towards the earth. This solution is certainly not satisfactory because it is known that in the intersidereal spaces exist waves of such high frequency that any germ would be mercilessly killed. The distance of the planets from the earth is so great that it would have taken many years for the germs to migrate and

certainly they could not have resisted the intersidereal cold for such a long time. All that Arrhenius did was to transfer the problem from this earth to other planets, and in these planets how did life originate?

How can we then explain the origin of the first living matter? We are faced with two principal ideas:— The first admits of a creative act by a divine being. The second is that of the formation of organic matter from the inorganic. One is Faith, the other is Science.

Can the two go hand in hand? Certainly, if we admit the intervention of a Creator. If biochemists were to succeed in creating life artificially in the laboratories, the problem of the origin of life would no longer exist. No scientist can claim that great feat. No living protoplasm has ever been created by artificial means.

Great progress has, however, been made with the help of Chemistry and it has been possible to form artificially organic compounds from inorganic matter, a process which is after all continually going on during plant photosynthesis. The result at one time roused the hope of success. In 1911, Moore succeeded in a series of experiments in the formation of formaldehyde and substances interpreted as carbohydrates. In his experiments he subjected to the action of ultra-violet rays a colloidal solution of Uranium, Iron, and Aluminium through which Carbon dioxide was bubbled. Baly went a step further and obtained fructose and glucose. Later, by subjecting to the action of ultra-violet rays a solution of Potassium nitrate saturated with Carbon dioxide, he obtained Glyoxalin, Alkaloids, and Amino-acids. In ordinary language, Moore and Baly artificially produced the most simple nitrogenous substances which are indispensable for the formation of proteins; and proteins are very complex chemical bodies which go to build protoplasm. These are

in themselves very interesting results but leave the problem as obscure as ever.

The hope of success, however is not yet dead. In fact, the great physiologist Jacques Loeb once said that he could not find any reason to justify the pessimistic conviction that the results desired could not be achieved. He went on to say that it would be a great help to science if the hope of resolving the problem was encouraged in young biologists as the most elevated ideal in biology.

What we must reject is the materialistic doctrine which was formulated by Haeckel. According to this doctrine, life has originated from inorganic matter by spontaneous generation, the successive evolution directed by a blind determined law, without the intervention of the first cause, which by hypothesis does not exist. With regard to this Dr. Phillips says: "What philosophy can tell us, then, about evolution is first, that purely materialistic evolution of the type put forward by Haeckel is impossible; and, secondly, that any theory of evolution which sets out to give an account of the way in which the animate world has come to be in its present state, and aims at making such an account satisfactory from the philosophical point of view, i.e. as giving an ultimate explanation of the

whole matter, must take account both of teleology and purpose, and of the action of the first cause."

In other words, any theory of evolution must admit that everything was made for an end; there is no blind determined law here. Even if we admit that man's body is derived from other forms of life his soul is not so derived.

In conclusion we may quote the late William Bateson, the English biologist: "In dim outline evolution is evident enough. From the facts it is a conclusion which inevitably follows. But that particular and essential bit of the theory of evolution which is concerned with the origin and nature of species remains utterly mysterious."

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