

Perspectives in Evolution*

A CORRECT understanding of the implications of the rapid discoveries being made in Zoology since the beginning of this century can only be had by an examination of these discoveries with reference to the long range view of the existence of life on this earth and this is the thesis examined by Prof. Ritchie in his address to the Zoology Section. The first of these long range views concerns the origin and nature of life. The author examines the mechanistic and vitalistic conceptions of life, the vortex theory, the equilibrium theory and also the bearing of enzyme actions on the understanding of life's processes but concludes that none of these ever offers a complete understanding of its mystery and secret. The characteristics of life are very different from the characteristics of lifeless things and in fact the processes governing the actions of the two are different and are probably completely opposite. The power exhibited by living organisms to abstract from the atmosphere, their medium and generally from their environment, materials that are found in very small quantities, is one which has no parallel in nonliving things, for physical laws tend towards a maximum dispersal of their particles instead of their segregation. But yet the actual mode of the origin of life on earth eludes us. It may be said that life originated as a result of a concourse of atoms but this is more a possibility than a probability. It is impossible too, to say what the first living thing looked like, whether it was a virus, a bacillus or just an undifferentiated mass of protoplasm capable of reacting to its environment. It therefore becomes necessary to take the origin of life as an axiom and once this is done, all

the different biological phenomena become explicable.

There is still another concept of life which is as breath-taking as it is baffling. It is now estimated that life has existed on the earth for perhaps 1,200 million years and that the earth itself is about 2,000 million years old. Against this stupendous background of time has Evolution been progressing, slowly and with limitless patience. Against this background man appears but an insignificant thing, his part in evolution a microscopic one, his activities but a tenuous struggle. He appeared on the earth from 25,000 to 40,000 years ago but only very little of this period—in fact only the last 300 years—has witnessed any of his great transformations. As Prof. Ritchie picturesquely puts it, man's achievements have been crowded into less than one-tenths of a second of a twelve-hour past life of the earth.

There is yet a final question which Prof. Ritchie asks,—what of the future of Man? If we assume that life will continue on earth for as long as it has existed already, it must be admitted that evolution will continue. What will the human being at the end of earth's life look like? Nobody can tell. Science is unable to forecast the long future of evolution. It has often been said that man is the culmination of evolution and the future of evolution must only consist in a development of individuality of mental and intellectual ability and in the perfection of a great social order. But when the huge past of over a 1,000 million years has produced such a wealth of evolution, is the huge future of about the same period likely to produce nothing more or better than just a better man? It is on the other hand more probable that man is but a stage in life's progress, just as the dinosaurs were in the Triassic period. And what the future lines of this progress are, nobody can foretell, nor even imagine.

* Summary of the Presidential Address by Prof. J. Ritchie. Zoology Section—British Association for the Advancement of Science, Dundee, 1939.

The Assessment of Physical Fitness*

EVERY one talks glibly of Physical Fitness. Many are unaware of its implications. Diverse definitions are given and though we are generally aware of the many qualities that a fit person should possess, we are unable to test those qualities in the light of what is expected of them. Is it a good configuration of the body, is it physiological efficiency or is it the possession of a superior mental equipment that is the criterion of physical fitness? This question is examined by Prof. David Burns in his address to the Physiology Section. It must be admitted that data regarding the form and stature of the body are valueless in testing physical fitness and an undue emphasis on somatometric assessment alone is liable to mislead us. It is true certain initial advantages or disadvantages are conferred on subjects who are endowed with positive or negative qualities regarding form

and stature of body but only when they are associated with other functional qualities are they of any value in assessing physical fitness. Physical fitness is primarily physiological. Of the different kinds of measures of physiological fitness indicated, the most important are the efficiency of the functioning of the cardio-respiratory mechanism, the rate of heat loss under different conditions and the value of muscle tone. On the other hand, the quality and state of mind are also of great importance in assessing physical fitness and there is really a close correlation between the state of one's mind and the amount as well as quality of functional activity one is able to put in. It may be true that man was asked to earn his bread by the sweat of his brow, but there was really no intention of precluding him from taking a joy in his work. In fact, in this the secret of efficiency lies. "Our natural strength lies in our men and women and not in the machines that they tend or the battleships that they man. To be really great a State must have citizens fit in body as well as in mind."

* Summary of the Presidential Address by Prof. David Burns. Physiology Section—British Association for the Advancement of Science, Dundee, 1939.