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DR. WALLACE'S LECTURE ON EVOLUTION.

WHATEVER opinion may be entertained as to the truth or falsity of the theory of Evolution, every fair-minded person must entertain the greatest respect and admiration for the men who have spent their lives in acquiring vast stores of information, carefully sifting evidence, and subjecting the results of their labours to the very severest criticism before propounding their theories. There is perhaps no book extant upon a controverted subject that presents the objections to the author's views as fairly as does Darwin's work on the "Origin of Species." Many and serious, and vehemently urged as these have been, if it is desired to have them placed clearly and fairly and in their strongest light before one, recourse must be had to Darwin himself and not to his critics. With Haeckel and others of his school it is different, though one is forced to admire and respect the profundity of their knowledge. Indeed, when men have acquired the knowledge of Nature which these great naturalists have amassed and given to the world, they become themselves living and convincing proofs that there is a gap between man and the lower animals which cannot be bridged.

It is impossible, and would be presumptuous, to attempt to contest the views expressed by Evolutionists without possessing almost illimitable knowledge of Natural History. But, thanks to the popular manner in which they have presented their theories to the world, it is possible to deal with their reasoning based upon facts admitted and furnished by themselves.

It is to be regretted that Dr. Wallace did not, in his lecture on this subject delivered in University College, deal with some of the grave objections that have been raised to the theory. The lecture was confined to a statement of Darwin's hypothesis, accompanied by *prima facie* evidence of its possibility. Perhaps the gravest objection that has been urged against it is that geological time is too short for the development of species by the process of Evolution. The calculations of the age of the earliest known deposits range from 250,000,000 to 400,000,000 years. In these deposits fossil remains of species have been found, differing from each other as clearly and distinctly as do existing species. It is admitted, then, that if the theory be true, the earth must have swarmed with animal life for ages before the earliest known deposits. And, as the process of differentiation is said to have been slower amongst lower than amongst higher organisms, there must have been a period, during which the process of development was going on for the formation of the earliest known species, proportionately very much longer than that which has since elapsed—a period inconceivable to a finite mind. But it is asserted by scientific men that the earth, during that period, was not capable of sustaining life; that it is only within a comparatively recent period that it has become cool enough for the existence of plants and animals. With this objection we might well have expected Dr. Wallace to deal, inasmuch as he has made an independent calculation of the supposed age of the earliest deposits,

which he places at 28,000,000 years. The difference in the calculations may possibly to some extent dispose of the objection, but it does not completely answer it; because the species were co-existent with the formation of the rocks, whether the latter are young or old. It is said that the geological record is imperfect; but so, then, is the theory of Evolution until further evidence is adduced.

Other objections, such as the absence of transitional forms, the existence of sterile workers amongst insects, the peculiarities of electric fishes, of glow-worms, and carnivorous plants, were not touched upon, though remarks upon these subjects would have been most welcome.

The substance of the lecture itself, though elementary, was most clearly and ably placed before the audience. The theory was succinctly stated as Darwin has stated it, that of the numerous individuals which are brought to life, only those which are best fitted for the struggle for existence survive. The survivors transmit their qualities to their descendants, of whom those best fitted for the struggle survive, transmitting their qualities in turn to their descendants, and so on. That there is such a thing as variation in nature was a fact to be established. And the lecturer showed that by actual measurements of numerous individuals of a species, they varied extensively from each other. But in selecting an individual as a base, or mean specimen, and measuring the variations from him, there appears to be a fallacy. If the theory of Evolution be true, all species must (paradoxical as it may seem) be in a habitually transitional state. To assert the contrary is to assert the present stability of species. But if a species is now constant, the process of evolution must, for the time, be suspended. Therefore, any individual selected as a normal specimen must be a specimen of a transitional form. The proposition, as expressed in the term "descent with modification," always implies an ancestor whose descendants exhibit variations enabling them to survive, and who must himself have possessed variations which enabled him to survive in the struggle for existence. What then is the parent stock? What is a normal or mean specimen? In order to arrive at the mean of any species we must take the average of all its component parts. But that cannot be done unless the species be first ascertained and defined.

It is, however, a fact that the individuals of a species have been ascertained by actual measurement to vary extensively from each other. And if we take the sum of all the variations from a normal specimen, there is shown to be a possibility of variation to such a degree as to produce an entirely distinct species. But does Nature add up all the variations? Granted that the individuals vary in all directions, it must, however, necessarily be that a very large proportion of the variations cancel or annul each other. A bird with a long beak and short wings may pair with one having long wings and a short beak, and the offspring may revert to the normal type. So with the other individuals of a group. And the constant intercrossing of individuals must necessarily tend to nullify the effects of variations, and preserve the average. Proof of the truth of this conclusion seemed to be furnished by the lecturer in dealing with the question of the variation of domestic plants. For instance, it was said that when man made use of roots for eating, the roots of the plant varied most; when he used the fruit, the fruit varied most; when he used the seeds, the seeds varied most; while the leaves exhibited little or no variation. The reason for this, it was asserted, is not that the plants used by man have been specially created with the capacity for so varying, but that man by seizing on all the favourable variations in the roots, fruits, or seeds, and adding them together, produces a wide divergence in those parts from the original type, while the remainder of the plant, being disregarded by him and left to Nature, does not so vary. The logical deduction from this is that Nature does not add up all the favourable variations, but allows them to be set off against unfavourable variations, and so preserves the average constancy of the species.

With respect to man's place in nature but little was said; but it may be shortly summed up as follows: The evidence is overwhelming that man owes his physical structure to a lower organism. Why, it was asked, if Evolution produced step after step in animal life, should it have fallen short of man? So much with regard to his physical structure. But the possession of those faculties and attributes which distinguish him from the beasts must be otherwise accounted for, and must have been directly assigned to him.