

This old question having been thus again started by its oldest advocate, a few words in reply to it may be permitted to one of its oldest opponents. Not that I was always an opponent. The doctrine of Messrs. Darwin and Wallace, as advocated by the late Prof. Huxley, was held by me from 1860 onwards for several years. There was no antecedent reason why it should be unwelcome to me, and, in fact, it was not at all so. It was whilst working at Lemuroids that doubts first suggested themselves, which afterwards became, for me, certainties.

It is one of those animals—the Potto—which has a specific character, the least likely of any that I know of to have been produced by “natural” or “sexual” selection—one which I cannot believe was ever occasioned by “utility,” though it may have been so by another now suggested cause. It appears to me to be an indisputable fact that in certain groups of animals there are, somehow, present, innate tendencies to development along certain lines; different degrees of the realisation of which tendencies are characteristic of different species; and this without affecting the preservation of life. Thus amongst the Lemuroids there appears to be a tendency to diminish the size of the index finger, and this tendency culminates in the Potto.

In a section of the *Marsupialia* there seems to be a similar tendency to diminish the size of two digits of the foot, though I cannot believe that life has been saved at either the initial or the extreme stages of this progressive degradation.

Our own species supplies another example similar in character. The penial bone of the lower apes is a considerable structure, but in the Anthropoids it becomes so rudimentary, that the chimpanzee was believed to have none till the late Mr. Crisp exhibited the rudimentary representative of that structure at a meeting of the Zoological Society, as I well remember. In man it has, at least normally, entirely disappeared, and yet it is impossible to suppose that its progressive disappearance has been progressively useful as regards any form of “natural selection.”

The existence of a latent tendency in a group of animals seems to us peculiarly well marked in the Birds of Paradise. The exceptional abnormalities of their plumage are so different in different species, that these could never have sprang from a common origin, but must have independently arisen in different modes in different species.¹

Dr. Wallace said: “Accessory plumes and other ornaments originate at points of great nervous and muscular excitation.” But the points of origin of abnormalities of plumage in these birds are so numerous and diverse, that such local excitations seem a very inadequate cause to account for them. Yet even if they were adequate, what would account for such varied localities of excitation in this particular group of birds alone?

But Dr. Wallace affirmed that such characters were utilised “for purposes of recognition,” . . . “each ornament being really a ‘recognition mark,’ and therefore essential to both the first production and subsequent well-being of every species.”

Let us suppose that a certain group of birds (A) have begun to vary in such a way that the males have acquired incipient secondary sexual markings or growths in their plumage, and that another group of birds (B) have begun to vary so that new tints, or plumage growths, appear equally in both sexes. The change must be small at first, and, indeed, Dr. Wallace said “the transition” is an “almost imperceptible process.” But what influence can, at the same time, induce the males of the group (A) to seek for females newly modified but different from themselves, and the males of the group (B) to seek for females newly modified but like themselves? Why should the slightly modified new varieties object to mate with members of the hardly different parent stock? Yet if they did not so object in a majority of cases the new variety would soon disappear. Dr. Wallace told us that such marks must have been specially needed during the earlier stages of differentiation, yet at such early stages the much-needed “recognition marks” must have been at their minimum. This innate spontaneous impulse to breed together, thus supposed to arise in members of every incipient new variety whence every new species has arisen, is surely a very mysterious impulse. No doubt Dr. Wallace has evidence that it does in fact exist; but if so, we must admit that somehow a quasi voluntary process—a psychical character—has been pre-caused (if we must not say pre-ordained), which is a *sine qua*

¹ I called attention to this fact in my “Genesis of Species” in 1870. Since then the discovery of new species with new abnormalities has intensified the force of the argument.

Are Specific Characters the Result of “Natural Selection”?

THE last meeting—on June 18—of the Linnean Society was one of very exceptional interest, because the survivor of the two illustrious naturalists who, on the same night—more than thirty-seven years ago—first enunciated in that Society’s rooms the doctrine of the origin of species by “natural selection,” read a highly interesting paper on that very subject.

The title of the paper, by Dr. Alfred R. Wallace, F.R.S., however, was “The Problem of Utility: Are specific characters always or generally useful?” But the author, in treating the question, expressly took for granted (as might surely have been expected of him) the doctrine common to him and the late Mr. Darwin. So the question was implicitly answered at once; for if species arise by “natural selection,” then those characters which constitute them species must be due to the same cause, *i.e.* to utility. Thus the question really raised by Dr. Wallace was the old one, “Do species arise through ‘natural selection’?”

non for the origin of new species, but the origin of which character is as mysterious as the origin of a species itself!

Dr. Wallace affirmed that "no other agency" than "natural selection" has been shown as a probable cause of specific characters—and therefore of species. Possibly not. But if an asserted cause (X) has been shown to be incapable of producing a certain effect, it is no use to say: "It must be (X) because you cannot bring forward any definite (not X) as efficient to produce that effect." Surely it is enough to reply: "The cause you assert is insufficient, and we must therefore still remain in an attitude of doubt and expectancy."

Dr. Wallace, however, in his recent paper did admit that the distinctive characters of some exceptional species might not have been due to "utility" or "natural selection"; but such an admission seems to me a fatal one, for if an unknown cause may have given origin to some species, why may not such cause have been the really efficient agent in the production of all species?

But Dr. Wallace years ago made (and he has never since repudiated his act) a truly important exception to the action of "natural selection."

A survey of the organic world cannot certainly be a scientific one if the highest of animals (man) be left out of the account, nor can man be said to be scientifically treated if his highest characteristics be altogether neglected.

Dr. Wallace cannot be accused of such neglect, and therefore with a survey of the organic world thus scientifically defective. Taking account of man's highest intellectual powers, he has declared that "natural selection" must have been incompetent to produce them, and agreed with me in the conviction that they require some further and higher explanation.

A recent number of NATURE has contained a review of Prof. Weismann's paper read at Leyden. Therein, that ardent Darwinian appears to have made several notable concessions which bear upon the question treated by Dr. Wallace. One of these is that "mimicry" cannot be accounted for by accidental, individual variation; he appears to say the same concerning certain co-adjustments of instinct and structure, and he fully concedes the truth asserted by Mr. Herbert Spencer and by myself—the truth, namely, that *panmixia* cannot explain the annihilation of rudimentary organs.

He, however, reaffirms his dictum that the idea of "teleological contrivances is inadmissible in science." But why? Who can deny to reason its right to investigate truth on all sides, and affirm that which appears to be evidently true with respect to any, including vital, processes? I adhere to the pronouncement of the world-renowned John Müller: "Physiology is no true science if not in intimate union with philosophy." Once more I must urge that man and his highest intellectual powers cannot be excluded from a scheme of nature which is truly scientific. Man has intelligence, and acts more or less frequently with intelligent purpose—"teleological contrivance"—and he exists in a universe which, as a whole, can never have been submitted to the action of "natural selection." The universe, therefore, even if eternal, cannot have unreason for its cause, or any power devoid of intelligence and purpose.

I believe the indisposition to accept such truths as a part of science is largely due to our common tendency to permit the intellect to be fettered by the imagination, thus giving rise to anthropomorphic mental images, the absurdity of which is assumed also to belong to those intellectual conceptions with which they have infinitely less to do than have the signs of the zodiac with the coherence of the solar system.

Saltburn-by-the-Sea, June 29. ST. GEORGE MIVART.