

Eye Migration in Flat-fishes and Lamarckianism.

MR. R. H. LOCK, in his recent book on "Variation, Heredity, and Evolution" (reviewed in NATURE of April 27), has, in common with many other writers, adduced the phenomenon of eye transposition in flat-fishes as a cogent argument in favour of the transmission of acquired characters, remarking that "an alternative hypothesis is lacking." I venture to dispute this position, believing it to be decided evidence in support of the potency of natural selection to accumulate small mutations. I quote a part of the passage (p. 35) that my argument may be the better understood:—

"In the adult condition these fishes lie flat on one side; and during their development from the young condition that eye which, if it remained in its original position, would look directly downwards travels round the head until it comes to lie quite upon the upper surface. . . . The very young fish whilst still symmetrical, are known sometimes to fall upon one side, and when in this position to twist the lower eye forcibly upwards. Darwin himself therefore supposed that the origin of the adult structure is to be attributed to the inherited effect of efforts of this kind."

This misinterpretation of the phenomenon seems to me to arise from an inadequate appreciation of the nature of the actual variation, *i.e.* the capacity to twist the eye, which is exhibited by the young fish. The young of some other fish are known to exhibit the same muscular control over the orbit ("Origin of Species," p. 292), and we need only to suppose that the forerunner of the modern race of flat-fishes possessed it as a fortuitous variation to the extent of making vision just possible whilst in the recumbent position; and this would seem to be the case, for it is recorded in the "Origin of Species" that a young fish has been observed to "raise and depress the eye through an angular distance of about seventy degrees." In the transmission of the original variation to the offspring it is not the effect of the movement which is passed on, but the structural arrangements which enabled it to initiate the movement, the amplitude being increased in successive generations by the aid of natural selection.

This contention may be supported by citing a peculiar muscular capacity possessed by myself. I am able to raise and depress the right eyebrow independently of the left, but I have no such control over the other. To test whether this power may not be induced by practice, I have striven to raise the left whilst holding down the right, but find myself quite unable to accomplish it. Herein we see that the capacity to make the movement is of itself a distinct mutation; and assuming that in the case of the flat-fish mobility of the optic aperture was so far possible as to be of advantage to it, natural selection would operate in preserving those of the progeny which were able to retain the eye in the advantageous position with the least possible effort.

I have ventured to tender this explanation to the readers of NATURE because the phenomenon is very generally used as a good illustration of Lamarck's doctrine, and as being "inexplicable on the theory of natural selection."

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TWO WORKS ON INDIAN ETHNOGRAPHY.¹

MR. CROOKE'S book appears in a series edited by Mr. N. W. Thomas which, to quote the general preface, "is intended to supply in handy and readable form the needs of those who wish to learn something of the life of the uncivilised races of our Empire." To Mr. Crooke has been entrusted the task of describing the races of northern India, and we may at once state that he has achieved very considerable success. The area covered, extending from Afghanistan to the Chinese

¹ "The Native Races of the British Empire. Natives of Northern India." By W. Crooke. Pp. xiv+270. (London: A. Constable and Co., Ltd., 1907.) Price 6s. net.

"The Khasis." By Major P. R. T. Gurdon, I.A. With an Introduction by Sir Charles Lyall, K.C.S.I. Pp. xxvii+227. (Published under the Orders of the Government of Eastern Bengal and Assam. London: D. Nutt, 1907.) Price 7s. 6d. net.

frontier, is so great, and its aspects are so complicated, that not even such an authority as this distinguished scholar could venture into details within the limits of the two hundred and fifty odd pages at his disposal; but he has given a broad general view, sketching in with a few accurate and telling strokes the more prominent features of the landscape, so that the whole presents a satisfactory and attractive summary of the racial characteristics of an important section of the British Empire.

After a brief account of the country and of the influence of its environment upon the people, Mr. Crooke describes its three main physical race-types—the Mongoloid, the Dravidian, and the Indo-Aryan. The last-named leads him to the consideration of the castes of the great plains, to the Indian village and its industries, and to the home life, including the occupations of women, together with the games and amusements of the children. Turning to the religion of the people, we have first an account of the birth, marriage, and death rites, and then a general description of the popular religion, magic, and witchcraft. There are more than thirty admirable full-page illustrations, the value of which is somewhat impaired by the binder having placed them at approximately equal distances from each other throughout the book, without consideration of the context to which they refer, and which, in spite of a good index, it is not always easy to find. In other respects, too, the mechanical execution of the work leaves room for improvement. Proper names are not always spelt correctly. The well-known Norwegian philologist appears as Dr. "Steinkonow," and the proof-reader's ideas of the spelling of the name of a writer on Chota Nagpur oscillate between "Bartley-Birt" and "Bradley-Birt," the latter, of course, being the correct form. Worst of all, the numbering of the plates was evidently altered after the text had been printed off, so that not a single reference in the text to the plates is correct.

These are, however, but minor matters, which can easily be set right in the next edition, and for the work as a whole, although we may differ on a few controversial points, we have nothing but praise. Mr. Crooke, while following Mr. Risley in his conclusions as to the race-origins of the Indian people, shows a wise caution in accepting his opinion with regard to details, and, like other scholars, enters a protest against his undue extension of the name "Dravidian" (properly a linguistic term) to the entire mass of the population of northern India which is not Aryan or Mongolian. He himself, on the other hand, seems to have misunderstood the results of the latest philological researches when he states that it has been recently proved that the two great non-Aryan linguistic families of India, the Munda and the Dravidian, are mutually connected. He quotes Dr. Grierson's authority for this; but we are under the impression that, in his latest writings, that scholar has strongly maintained the distinct origin of these two groups of speeches, and the researches of Pater Schmidt, of Vienna, have shown that the Mundas are related, both ethnically and linguistically, to the Mon-Khmer tribes of Further India, and perhaps even to the inhabitants of Polynesia. As for the Dravidian languages, it seems not improbable, although positive proof is yet wanting, that they are connected with those of the aborigines of Australia. The fact that the speakers of Dravidian languages and the speakers of Munda languages have the same physical type has not yet been satisfactorily explained, but Dr. Sten Konow's theory that the common type is really Munda, and has been acquired by the Dravidian-speakers through intermarriage (just as the Indo-Aryan type of the Lower Ganges