
TROPICAL NATURE

Tropical Nature and other Essays. By Alfred R. Wallace. (London: Macmillan and Co., 1878.)

MR. WALLACE tells us that the luxuriance and beauty of tropical nature is a well-worn theme and that there is little new to say about it, and yet he thinks that none have as yet attempted to give a general view of the phenomena which are *essentially* tropical or to determine the causes and conditions of those phenomena. Indeed many very erroneous ideas are commonly entertained about the charms of the tropics and about the brilliant tints of its flowers, and birds, and insects.

In the first three chapters of this most interesting volume Mr. Wallace treats of the climate of the tropics, of its vegetation, and of its animal life. A fourth treats of the humming-birds as illustrating the luxuriance of tropical nature. The next two enter on the discussion of the nature and origin of the bright colours of animals and plants, showing how far and in what way these are dependent on the climate and physical conditions of the tropics. A seventh chapter contains an account of certain curious relations of colour to locality, which are almost exclusively manifested within the tropical zones, while the next and last chapter tries to explain the probable origin of many of the forms of life now characteristic of tropical regions.

Despite its being a well-worn theme and its want of novelty, Mr. Wallace has succeeded in writing a most interesting volume on the peculiarities of tropical life, and this chiefly from the results of his own long experience of nature in the eastern and western tropics of the equatorial zone, while his theory to account for the diverse colours, the special adornments, and the brilliant hues which distinguish certain male birds and insects—a theory quite opposed to that of Mr. Darwin's—cannot fail to attract the attention of all interested in this subject.

Mr. Wallace's account of his theory is perhaps the most important portion of his book; he finds, on close examination, that neither the general influence of solar light and heat, nor the special action of variously-tinted rays, are at all adequate causes for the many wondrous complexities of colours with which we are acquainted. He would therefore take another view, dividing the colours into groups, as they are protective to the creature, act as warning colours, or sexual colours, or typical colours, or simply as in floras, attractive colours.

Mr. Darwin's theory on this subject of colours was that all, or almost all, the colours of the higher forms of animal life were due to voluntary or conscious sexual selection, and that diversity of colour in the sexes is due at least, first of all, to the transmission of colour variations either to one sex only or to both sexes, the difference depending on some unknown law and not being due to

simply natural selection; but Mr. Wallace regards this view as erroneous, and to him the very frequent superiority of the male bird or insect in brightness of colour, even when the general coloration is the same in both sexes, seems to be due primarily to the greater vigour and activity and the higher vitality of the male. He reminds us that the colours of an animal usually fade during disease or weakness, while robust vigour and health add to their intensity. This intensity is most developed in the male during the breeding season. It is also very general in those cases in which the male is smaller than the female. This greater intensity of coloration in the male would be further developed by the combats of the males for the possession of the females. Increased vigour, acting thus on the epidermal system, would soon produce further distribution of colour, and even new tints and markings. Nay, even the remarkable display by so many male birds of their peculiar beauties of colour and plumage may be thus accounted for; for at the pairing season these birds are in a state of the greatest energy. Even unornamental birds, at such a season, flutter and spread out their wings and erect their head-crests or their tail-feathers; and there would be a progressive development of these ornaments in all dominant races, and if those portions of the plumage which were originally erected under the influence of anger or fear became largely-developed and brightly-coloured, the actual display under the influence of jealousy or sexual excitement would be quite intelligible; the males would soon find what plumes were most effective, and would endeavour to excel their rivals.

It will thus be seen that Mr. Wallace's theory of colour might almost be called a molecular one. The causes of colour are due to molecular or chemical changes of certain substances, and on the action on these of light, heat, and moisture. They can be produced or intensified by processes of development, and this as the surface bearing these colours is extended or diminished and as there is a surplus of vital energy; or they may be, as in plants, acted on by some, as yet, unknown local action dependent on the soil or on vegetation.

Doubtless this theory will give rise to much controversy; and in the course of this, no doubt, many important facts will be elucidated. Thus, Mr. Wallace reminds us that, in the case of those female birds with brighter plumage than the males, the females are larger, more pugnacious, and show more of vital energy.

One portion of tropical nature Mr. Wallace has overlooked in the volume—that which spreads its brilliant colouring over the white rocks that lie under the sea. Crowds of lovely forms are here; and they are worthy of a chronicle.

E. PERCEVAL WRIGHT