

### Selection and Segregation.

IN view of recent discussions in the columns of NATURE, the following remarks may be of interest.

Charles Darwin did not explore for himself the vast resources of the new territory which he discovered, nor did he traverse all the passages leading to it. He "allured to brighter worlds and led the way." In doing so it is possible that he did not arrive at the point of disentangling the qualitative from the quantitative implications of selection. It will be remembered that his theory was followed by long discussions on "What is a species?"

Natural selection is mainly qualitative, while specific differences are essentially quantitative. If Darwin can be said to have missed this distinction it was because he could not anticipate all the objections that might be brought to bear upon his marvellously fruitful concept. Moreover, quality and character often appear without any obvious separation, and in all cases the mind has to be addressed to the task of discrimination.

It is the province of Mendelism or genetics to deal with the analysis of unit characters and to exploit favoured individuals. Natural selection is concerned with the combination of characters, internal as well as external, and with the preservation of favoured races. Combination of characters gives quality to a genus; segregation of characters imparts novelty to a species. Mendelism and Darwinism clearly belong to different categories; though of course they meet on the common stamping-ground of heredity.

Natural selection is the directive force which controls the motive impulse of evolution and holds it within bounds. It thus becomes to our view the guardian of mutations, the custodian of change; that is to say, it provides an automatic control over the fitful mutations of the organism. The four pillars of organic evolution—struggle, survival, mutation, and adaptation—are properly orientated by natural selection. This operates in certain directions under certain conditions of climate and contact; it is the chain of events which assigns an organism to its place in Nature. Nevertheless, the simple thesis had not been excogitated before it was expounded by Darwin. It was a permanent gain to knowledge which can never be repeated, like the discovery of the circulation of the blood by Harvey and the biogenesis of reproduction by Redi.

Darwin gave us a theory of qualitative evolution by the natural selection of spontaneous variations in the open. Survival for an hour or for an æon implies unconscious selection for the time being. On the other hand, Mendel gave us a quantitative law of alternate inheritance of contrasting characters under culture. A single example, expressive of many, may serve to bring the distinction between intrinsic qualities and gross realities into crude relief.

Leaf-mimicry is one manifestation of interrelation of plants and animals, of which floral imitation and stick and twig shapes are others. It is a quality so intangible that it may be called into question even when most obtrusive. Individual observations are therefore of little moment until confirmed. The leaf butterfly (*Kallima*) and the leaf insect (*Phyllium*) resemble a leaf in different senses—the former vertically, the latter horizontally—the recognition of the resemblance in these classic examples being old-established. Some years ago ("*Spolia Zeylanica*," II, 1904) it was my privilege to bring to scientific notice for the first time the behaviour of a leaf fish (*Platax*) in Ceylon. Similar observations on a species of *Platax* in the Philippines have since been recorded by Dr. Th. Mortensen of Copenhagen. (*Vidensk.*

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Admitting the existence of leaf-mimicry in diverse planes and orders, we can only begin to explain it on the basis of natural selection, the leaf shape being desirable and attainable when other contributory factors are equal.

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### Distribution of Megalithic Monuments.

IN NATURE of March 31, p. 442, reference is made to Mr. W. J. Perry's speculations upon the builders of megalithic monuments. Perhaps you will be good enough to find room for some criticisms. There is a real danger that the scientific study of archæology may be overwhelmed by the tide of theorising which is now flowing so strongly in this country.

Mr. Perry believes that the builders of megalithic monuments chose to settle in those regions which furnished natural supplies of what the note in NATURE terms "precious metals and other valuables." If so, then why did so many of them settle in the Cotswolds, where natural flint is almost non-existent, and where no metals occur? In this region—in the counties of Gloucestershire and Oxfordshire—there are fifty-six Long Barrows, which Mr. Perry rightly includes within the class of megalithic monuments. Why are there more than twice as many Long Barrows in Gloucestershire alone as in all the other flint-producing counties of East and South-east England?—The East Riding of Yorks, Lincolnshire (none), Norfolk (none), Cambridgeshire (none), Essex (none), Herts. (one), Bucks. (none), Beds. (two), Oxfordshire (none in Chilterns), Surrey (none), Sussex and Kent (perhaps a dozen at most between the two). If it was flint that determined their settlement-areas, there is more to be found in any single *parish* of any one of these counties than occurs naturally in the whole of Gloucestershire! Why, further, is it that there is not a single Long Barrow within forty miles of Grimes Graves, the great Neolithic flint-mining district of East Anglia, and no megalithic monuments within a hundred miles?

But the greatest difficulty is in Mr. Perry's suggestion that the builders of megaliths travelled in search of metals. There is no evidence that the builders of British megaliths knew of or made any use of metals. Not a single fragment of metal has ever been found in a megalithic burial chamber in England, Wales, or Scotland. Accordingly, the opinion of archæologists for half a century has been that all megalithic burial-chambers (including those in Long Barrows) are neolithic; and there is no evidence of any sort to suggest that this opinion is erroneous, much less to prove it wrong.

Some controlling factors in the distribution of Long Barrows over a part of England and Wales were suggested in Ordnance Survey Professional Paper No. 6. The facts upon which my conclusions were based were presented fully, both in tabular form and upon a map (O.S. quarter-inch, Sheet 8). For this region the facts—about a quarter of them new to science—are not available elsewhere. When the survey of England and Wales is complete, it will be time to draw conclusions about the country as a whole. Until then, those interested would be serving science better by assisting in the collection of facts than by indulging in premature speculation.

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