On the Tendency of Species to form Varieties.

By Thomas Boyd, Esq.

I have read the papers on the variation of species in the 'Zoologist' (Zool. 6292—6308) with much interest; and yet they have left an unsatisfactory feeling in my mind: on asking myself, "What does all this prove?" the only answer I could make was, "A possibility." They seem, in common with very much of the argument and discussion on allied subjects in the present day, like a return to the old philosophy, "the anticipation of Nature," as Bacon calls it, and the only result attained, or likely to be attained by it, is that we lose ourselves in doubt, like the ancient philosophers,

"And find no end, in wandering mazes lost."

The argument, it seems to me, starts upon the smallest possible basis of facts, the known variation in species, and then goes on, without any additional fact, to the possibility or probability of an indefinite extension of this variation. Is this wise! Is it in accordance with the spirit of modern Science?

But the last of the three papers referred to goes much further than the others; it is much more definite in its aim, it claims something of the character of a proof, and it carries the argument into ground scarcely touched before. After ably sketching out the effects of external circumstances on the numbers and variation of animals, the author lays down two points,—*first*, "that the animal population of a country is generally stationary, being kept down by a periodical deficiency of food and other checks," and *secondly*, "that the comparative abundance or scarcity of the individuals of the several species is *entirely* due to their organization and resulting habits, which, rendering it more difficult to procure a regular supply of food and to provide for their personal safety in some cases than in others, can only be balanced by a difference in the population, which have to exist in a given area." This, it seems to me, is far more general and comprehensive than is warranted by the facts of the case; all that is proved is that the want of food and the inability of self-preservation do exercise an influence over the number of species, and that it is probable that these are two main causes of numerical variation; but to go beyond this is to ground conclusions upon our ignorance, for there may be many causes, of which we know nothing, which exercise powerful influence over these phenomena.

In the next paragraph allusion is made to the probability that some

varieties of a species might have a better chance of escaping or protecting themselves against certain adverse circumstances than the parent species; as, for instance, unusual length of limb might give an antelope greater facility to escape from the feline Carnivora; and it is argued that, after such a variety had become numerous, any subsequent circumstances which would throw an additional strain on the vitality of such species would result in the annihilation of the parent, leaving only this variety, which is assumed to be a *superior* variety.

Now have we any right to assume that an antelope with longer legs than its parent is superior to that parent? It seems evident that we cannot, in any way, do so, unless we are certain that it has every other power and faculty in the same perfection as its parent, and is exposed to no other disadvantage on account of this partial superiority, and I cannot think there is sufficient ground for such an assumption; the additional speed which would enable it to escape from some enemies might be accompanied with dulness of sight or hearing, which would leave it more exposed to the attacks of others, and in all probability it would be accompanied by a thinner coat, which would render it more susceptible to changes of temperature, and by a necessity for more food, which would throw an additional strain on its other powers, and these and other circumstances of a similar nature would counterbalance the partial superiority supposed; and even if not,—even if any variety thus specially characterized should, under certain circumstances, acquire a numerical superiority over the parent species,—is there any reason to suppose that a subsequent change of circumstances would throw an additional weight into the scale in favour of the variety? I think not. The perfection of any organized being consists in its unity as a whole—in its adaptation to all the phases of its being; and a special modification in one direction, to meet certain circumstances, so far from rendering it more suited for different circumstances, would in all probability produce an opposite result.

But it will probably be objected that this is all very inconclusive; and so it is, and so must all our opinions on this subject be till we are far wiser than we are now. The fact seems to be that there is, among organized beings, a tendency to vary; but a tendency is not a law of indefinite progress; a tendency to increase is not a law of indefinite increase, neither is a tendency to vary a law of indefinite variation. Tendencies can be seen in their true light only when viewed in connexion with other tendencies which modify and set limits to them; and if, as in the present case, we know something more of one tendency than of the opposing ones, we have not, on that

account, any right to assume that those of which we know so little are in reality as weak as our knowledge of them is small: the only circumstance that can give us a right to conclude this is the fact that they do exert that modifying effect which they would if they were in existence and in active exercise; and of this fact, in the present instance, we have no proof; indeed the facts of the case seem to me to point, with no unmeaning finger, in the opposite direction—the specific distinctness of species, closely allied and following each other immediately in the course of time, seems now considered almost a geological axiom; nor, so far as I am aware, is there in the whole range of natural science, a single instance of indefinite progress, except in the case of man himself; and here it seems closely connected with, if not entirely dependent upon, his power of abstract conception; that is, upon that power which forms the grand distinctive mark which separates man from all other organized beings.

What we want on this subject is the record and collation of facts, experiments and observations; and if this be done I feel assured that we shall find here, as Kepler did with the irregularities in the orbits of the planets, that the variations return into themselves in constantly recurring cycles.

With regard to the last paragraph, I am quite at a loss to know what meaning to attach to it. Mr. Wallace says, "This progression by minute steps in different directions, but always checked and balanced by the necessary conditions, subject to which alone existence can be preserved, may, it is believed, be followed out so as to agree with all the phenomena presented by organized beings, their extinction and succession in past ages, and all the extraordinary modifications of form, instinct and habits which they exhibit." Does he mean that by the tendency to vary we may explain all the differences that obtain between different varieties of the same species, or between different species of the same genus, or between different genera of the same order; or, further still, that we may trace back all organic life, as we see it now, to some unknown root in the far-off geologic ages, some sponge, or polype, or vitalized cell, from which everything has since sprung. The words I have quoted will bear this construction, and if the tendency to vary were a law of indefinite variation, it might carry out this idea; but, being what it is, simply a tendency, it seems to me that painting such an ideal picture on the subject is like Science sitting down at the feet of Imagination.

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