

REVIEWS OF BOOKS.

MR. DARWIN ON PANGLOSSISM.*

(SECOND NUMBER.)

In the second volume of his work Mr. Darwin deals with the two great problems on which his theory rests—variation and inheritance—and adduces a multitude of facts to support his case. As in the earlier portion of his argument, he bases his views upon the thoughtful student by the very weight and mass of the testimony he lays before him. Nevertheless, this part of his treatise, though more interesting than the earlier one, is really not so satisfactory to the general reader, because the successive minor steps in the controversy are indistinctly formulated. And we cannot help regretting that this is so. For, after all, it is to the educated public rather than the scientific world that the author is addressing himself; and we fear that ordinary persons, though they will find their production enlivened by the host of wonderful facts which Mr. Darwin brings forward, will lay down his book with an admission of the probability of the natural selection theory, but with a very confused notion of the processes of reasoning by which they have arrived at that conclusion.

Besides the two points on which the author dwells in the first portion of his second volume, and to which we have alluded, there is another branch of his subject on which, for the first time, he expresses his opinion, and it is in this that we think the highest interest attaches. The theory of Panglossism is really the keystone to the philosophic work which Mr. Darwin has completed, and it merits more than a passing notice. But as the questions of inheritance and variation precede it, let us leave what the author has to say on these. We wish we could afford our readers some of the evidence, but to give a portion would be of little service, and to deal fairly with it would take up more space than we can spare. It is out of our power to do more than state a few of the propositions which it seems to us are sufficiently proved. Even among Mr. Darwin's disciples there is some difference of opinion as to the relative influence of hereditary power and external influence in the production of variation. Some, indeed, contend that outer circumstances are alone responsible for the departure which an animal shows from its parent type; others hold that all tendency to variation is inherent. Mr. Darwin's view is, to a certain extent, intermediate between, but so far as we can perceive he looks upon all variation as primarily due to external influences, and not as resulting from a latent tendency in vital genes. Concerning the variation which is seen in the offspring of mutilated animals, his opinion is by no means clearly stated, but he evidently admits the possibility of such accidents producing an effect upon the progeny. In favour of such an influence he says:—

"Dr. Procyer Lucas has given, on good authorities, such a long list of inherited injuries, that it is difficult not to believe in them. Thus a cow that had lost a horn from an accident, with subsequent generations, produced three calves which were hornless on the same side of the head. With the horns there seems hardly a doubt that long crookedness in the legs, caused by too much travelling on hard roads, was inherited. Bismarck's records the case of a man who had his little finger on the right hand almost cut off, and which in consequence grew crooked, and his son had the same finger on the same hand similarly crooked. A soldier threw a javelin before his marriage had his eye from previous operations, and his two sons were misshapen on the same side. . . . But perhaps the most remarkable and trustworthy fact is that given by Dr. Brown-Séquard, namely, that many young guinea pigs inherited an epileptic tendency from parents which had been subjected to a particular operation including in the course of a few weeks a considerable disease of the epilepsy, and it should be especially noticed that this eminent physiologist had reared a large number of guinea pigs from animals which had not been operated on, and not one of these manifested the epileptic tendency."

While he admits that variations are caused by external agencies, he shows that these agencies may be ranged under several distinct categories. Thus, we may have a direct effect produced, as in the cases above cited, resulting from mutilations, or the effect may be indirect, like the properties of a seed, said in some future generation a new equilibrium may bring it out; or, again, it may be due to intercrossing. The more distinctly established laws are five in number, and may be thus laid down:—

* Firstly, a tendency in every character, new and old, to be transmitted by natural and bred generation, though often counteracted by various causes and outward means. Secondly, reversion or atavism, which depends on transmission and development being distinct powers; it acts in several degrees and manners, though confined to a fixed generation. Thirdly, propensity of transmission, which may be

confined to one sex, or be common to both sexes of the present form. Fourthly, transmission limited by sex, generally in the same sex in which the inherited character first appeared. Fifthly, inheritance on corresponding periods of life, with some tendency to the earlier development of the inherited character."

We have stated that the author regards external conditions as mediately or immediately the cause of variation; but our readers must understand that Mr. Darwin looks rather to the circumstances which have surrounded remote ancestors than to those of recent date for the explanation of divergence of structure. The following passage (p. 291) contains a definitive expression of his belief in this matter:—

"When we reflect on the willows of India which many trees have produced before some one had been varied, we are led to wonder what the precise cause of such variation can be. Let us recall the case given by Andrew Knight, of the forty-year-old tree of the yellow magnolia known since, an old variety which has been propagated by grafts on various stocks for a very long period, throughout Europe and North America, and on which a single but distinctly profused red magnolia bloom. We should also bear in mind that distinct varieties, and even distinct species—as in the case of peaches, nectarines, and apricots—although separated by a vast number of generations from any progenitor in common, and although cultivated under dissimilar conditions, have yielded by bred variation closely analogous varieties. When we reflect on these facts we become deeply impressed with the conviction that in all cases the nature of the variation depends not so much on the conditions in which the plant has been reared, but not in any special manner in its individual character, but much more in the general nature or constitution inherited from some remote progenitor of the whole group of allied beings to which the plant belongs. We are thus driven to conclude that in most cases the conditions of life play a subordinate part in causing any particular modification; like that which a spark plays when a mass of combustible has been heated, the nature of the flame depending on the combustible itself, and not on the spark."

We must confess that we do not quite share the author's mode of viewing this question. Whether the influence be one which has lain latent or not, it is, of course, extremely difficult to determine. Indeed, the fact that in many cases the variation is a reversion to some ancient ancestor is suggestive of such latency; but there it might be assumed on the other side, that there is no proof of this dormant power, and it might be argued with no less propriety that a special set of conditions are associated with the manifestation of new structure. In any case, it is only in accordance with all physical teaching that the tendency, whether dormant or otherwise, should be the result of external operations. The fact of variation from injury in the tissues shows this. Moreover, the admission which Mr. Darwin makes further on, that one of these of organs leads to inheritance of corresponding modifications, seems to us to be an equally strong argument in favour of this view. The latency may, and doubtless does, occur; but Mr. Darwin will not, we should think, contend that the absence of associated external circumstances is a cause of variation a fact of an absolute order.

It will have occurred to the thoughtful reader, that in order to explain the foregoing laws and the phenomena to which they relate, some further hypothesis is necessary. Few who are accustomed to treat facts by a rigid system of scientific analysis would be content to accept as bald and metaphysical a solution of hereditary variation as that which is given in the term "latent tendency." However congenial such a method of sifting our reason may be to the old school of thinkers, who were content with theories of catalysis and phlogiston, it would find little favour from our modern biologists. Mr. Darwin has felt this, and he has advanced an hypothesis—that of Panglossism—which, if it is not capable of mathematical demonstration, is at least fascinating from its simplicity, comprehensiveness in its grasp of facts, and without singularity in accordance with the doctrines of recent physiology. Whewell says that, "Hypotheses may often be of service to science when they involve a certain amount of incompleteness and even of error," and the history of scientific progress in some measure bears this out. But Mr. Darwin's hypothesis is, we are disposed to think, one which will grow into a theory of universal application. We said Mr. Darwin's hypothesis—but we must observe that the theory is in great measure due to that wonderful insight into nature which Mr. Darwin has given evidence of in all his writings. Mr. Darwin, in acknowledging that the theory of Panglossism is an old doctrine in a new dress, in part attributes the merit of its conception to Huxley. We think this is a mistake, and, as we have said, it is to Huxley we the debt is due. It would be doing Mr. Darwin a slight injustice to say that his hypothesis is identical with Huxley's; but we will briefly lay the two doctrines before our readers, and let them judge for themselves. Panglossism holds that the sperm and germ cells, which are converted into the future being, contain molecules

* The Varieties of Animals and Plants under Domestication. By Charles Darwin, M.A., F.R.S. New York. London. John Murray.

corresponding to every organ which the future animal will possess. In the course of their existence, the tissues of the parent—whether male or female—are perpetually throwing off minute particles, and these particles—organic atoms, we might term them—accumulate to form the ova and spermata, which nature sets into Quatrefages calls the travelling vital cells a-going.

Ménière's view, expressed in his "*Mémoires pour servir à l'Histoire des Insectes*," is thus explained in a recent work:—

"There is no such thing as real production; development is merely phenomenon to be recognised. Plants and animals which in appearance it is easy to find have always existed, but appear only when circumstances which of their growth continually tends to be recognised by our senses. According to this doctrine, the history which has been hitherto followed has lived since the creation of the world, and has possessed all its wings, proboscis, feet, scales, &c."

Such is the hypothesis of Ménière. In many respects it is identical with Mr. Darwin's; but it differs in—that no doubt so far as natural selection is concerned is a feature of importance that it holds to an eternal finalness of character, which Mr. Darwin's theory would deny. For Ménière the butterfly must ever be a butterfly, but for Mr. Darwin it may, in course of time, become anything within the range of the possibility of variation.

The theory of Progression, while it regards the ova, or spermata, as made up of a number of molecules which have been, as it were, swept from the tissues by the violence of the blood currents, supposes that some of these may consist of organised atoms, and others may be the molecules of altered portions of the existing organism. We cannot touch on the beautiful relationship which this theory establishes between the otherwise heterogeneous facts which Mr. Darwin brings before us, but we would urge our readers to take up this portion of his book and examine it for themselves. We can only quote one remarkable illustration of Progression, and it is in itself a treat:—

"It was shown in the fifth chapter that certain characters are inseparable in each other, or do not readily blend together; hence when two animals with antagonistic characters are crossed, it might well be expected that a sufficient quantity of gametes in the male alone for the reproduction of the particular characters, would not be present; and in this case dominant gametes derived from some remote progenitor might easily gain the ascendancy, and cause the reappearance of long lost characters. For instance, when black and white pigeons, or black and white birds are crossed—colours which do not usually blend—blue-plumage in the one case, evidently derived from the rock-pigeon, and red plumage in the other case, derived from the wild single rock, occasionally reappear."

We have extended our notice further than we had intended, and yet we have only touched, and in outline, upon the remarkable doctrine which Mr. Darwin seeks to establish. As we have said before, we by no means desire to stir over the weaker points in the author's case, and we are far from admitting that he has rightly demonstrated his theory of the origin of species; but we should deal fairly with both Mr. Darwin and our readers if we failed to express our opinion that the theory of natural selection is, of all scientific hypotheses, one which explains most of the facts with which it deals, which has required the largest amount of support from naturalists of experience, and which involves the smallest degree of *prima-facie* improbability. Finally, that it is the theory which is most thoroughly corroborated by such newly stated facts, and without which we are left in absolute mystery as to the source of the legends of organic forms which now people our globe.

THE "ALABAMA" CLAIMS AND ARBITRATION.

THIS is a very valuable contribution to the controversy which has grown out of the *Alabama* claims. Whatever may be thought of Mr. Bowen's views, no one can deny that they are supported with great ability and competent learning, and that his arguments are well worthy of consideration at the present time. It is clear that the United States will not allow these claims to die out. They may not be pressed for a time, but this is no cause for satisfaction on our part, since they are certain to be revived when it is least convenient to us to entertain them. So long as they exist they are a permanent and serious source of danger, and it should, therefore, be one of the first objects of our Government to bring them to an immediate settlement by any means not inconsistent with

our national honour and dignity. Of course it is not pleasant to have to make concessions. Nothing but a strong case that we have done wrong, or, at any rate, that we have failed to do right, will induce Englishmen to do so, and Mr. Bowen, therefore, very properly commences his pamphlet by shortly stating the facts connected with the escape of the *Alabama* from Liverpool. Looking at these facts now, few persons will, we imagine, be disposed to deny that the Government of that day were culpably negligent in the tardy and perfunctory measures which they took with respect to this ship. It is clear from the depositions and affidavits which Mr. Bowen repeats, that at least ten days before she sailed on that "trial trip" from which she never returned, the authorities had the strong evidence before them that she was a man-of-war and not a merchant ship, that she was under the command of a well-known Confederate naval officer, and that, according to the general understanding amongst those on board her, she was to be employed in paying upon the commerce of the United States. And yet we not only refused her to go to sea, but we did not, as we might have done, send a British man-of-war to pursue and, if possible, seize her; we did not deny her entrance into our ports, we did not even try the *Mercer* Laird for the palpable violation of the Foreign Enlistment Act of which they had been guilty; in fact, we did not take a single step to vindicate our outraged neutrality. From whatever cause this inaction on our part sprang (and we do not mean to say that the conduct of Lord Palmerston's Government admits of no palliation), there can, we think, be no reasonable ground for doubt that it furnished the United States with a strong ground of complaint against us, unless indeed we hold, with "Historians," that a neutral nation is bound by an international rule to enforce law even unasked; that her duty to do so is only a duty which, according to the practice of the civilized world, she may with impunity neglect. That, however, is a position which Mr. Bowen disputes most strenuously and with the most complete success. He not only shows that, according to international law—as according to common sense and common justice—the neutral is bound to moderate its own neutrality, as the only means of preserving the impartiality which it is bound to display towards the belligerents; but he quotes "Historians" of greatly unimpeachable and unimpeachable authorities on which he professes to rely. What ought we, then, to do under the circumstances in which we find ourselves placed? Notwithstanding that he shares the general, and we think the sound, opinion that we acted "strictly within our right in asserting belligerent rights to the Southern States, Mr. Bowen does not hesitate to advocate our acceptance of arbitration on the terms proposed by Mr. Howard. He points out that it is an utter mistake to suppose that the American Foreign Secretary pretends a claim to neutrality on the ground of the Queen's proclamation of neutrality. His claims are solely on account of the damage done to the commerce of the United States by the *Alabama*. All that he desires is to see the proclamation as a topic showing our animus, and tending to induce the arbitrator to come to the conclusion that we did not do our best to prevent the escape of the ship from our ports. As Mr. Bowen well puts the case—and the view, we may add, is, so far as we know, a novel one:—

"Assuming that the recognition of the South as belligerents was a political measure which we were actually entitled to adopt—the only point, by the way, which the then law officers of the Crown could be called on to determine—it is no wonder to say that the principle which we displayed in the recognition will have a bearing on the issue whether England's subsequent behaviour towards the *Alabama* was so impartial and right as it should have been. For the reasons stated above, the writer does not believe Mr. Howard's letters can be fairly construed as a demand of damages for the recognition itself. His only claim can be losses sustained by the escape of the *Alabama* and her followers. In discussing these claims and losses, the United States desire to remove all theory of neutrality and arbitrator's law and disposition from the first. They may even grant that in proceeding our neutrality was wrong within our rights. Still, they may wish to sign that it was an unasked and unnecessary step. For the world's confidence in arbitrators of our behaviour from the summer of 1861 downwards be plainly immaterial to the question whether, in the summer of 1862, we dealt with the *Alabama* in a temper of unasked neutrality. The animus displayed in one year might illustrate or support the argument of negligence in the next."

On the double ground that the success of a claim is no reason for refusing to refer it, and also because Mr. Howard's position is not wholly untenable, it is submitted that our true policy would be to accept arbitration on Mr. Howard's conditions. A variety of other considerations tend in the same direction. It is desirable that England should as soon as possible escape from the false position which she occupies at

* The *Alabama* Claims and Arbitration, considered from a Legal Point of View. By Charles S. O. Bowen, Esq. Fellow of Balliol College, Oxford, and Barrister-at-Law of the Western Circuit. London: Longmans.