

THE LITERARY CHURCHMAN.

[JULY 16, 1882.]

DARWIN, ON NATURAL HISTORY.

ON THE VARIOUS CONTRIVANCES BY WHICH BRITISH AND FOREIGN ORCHIDS ARE FERTILISED BY INSECTS, AND ON THE GOOD EFFECTS OF INTERCROSSING. By CHARLES DARWIN, M.A., F.R.S., &c. With Illustrations. (London: John Murray, 1882. 8vo., pp. 305.)

THE subject of this work is not new. It was made known chiefly by C. Sprengel towards the end of the last century, in his valuable work *Das entdeckte Geheimnis der Natur* (the *Mystery of Nature revealed*), 4to., 1793; then alluded to with some hesitation by De Candolle, (*Physiologie Vég.*

II., p. 324); illustrated successively by A. Douglart, a celebrated French botanist, and by Richard Brown, one of the greatest men of his day in this branch of Natural History, though not altogether approved by Mr. Lindley (*Introduction to Botany*, 2nd edition, p. 341); and lastly, this subject is now set forth in a series of the most perfect, honest, and satisfactory experiments, both on British and Foreign Orchids, by the gifted naturalist whose valuable work is before us.

In a review of this kind we cannot of course enter into details. But, for the benefit of those of our readers who have not studied botany—and we trust they are few—we will just mention that in Orchids in general (there are a few exceptions), and also in other plants, the *Andropogon*, for instance, the anthers and pistils are so conformed and so situated in the same flower, as to make the fertilisation of

that flower by itself most difficult, if not impossible. This, however, as shown more especially by Mr. Darwin, is done by insects, chiefly moths and butterflies, which, drawn at night by the smell of some Orchids, in the day by the colour of others, visit these flowers, and while sucking the nectar they contain, or, at all events, while inserting their proboscis into the nectary, carry off to another flower of the same genus and species, the antheridia which, by reason of their viscosity, adhere generally to the trunk of butterflies, but sometimes also to other parts of their head. This, however, although not mentioned by Mr. Darwin, occurs in other flowers than Orchids, and by other means than insects. C. Sprengel is of opinion that the fertilisation of many flowers is effected by insects; as undoubtedly is the case with certain Composites in which all the florets do not open at the same time; while it is proved that humming-birds in South America, and even a species of tou-can, not only suck the nectar of certain flowers, but most likely contribute, like insects, to the fertilisation of these flowers.

But Mr. Darwin sets the matter at rest, in his experiments, by the clear, unaffected style in which he describes them, and by the excellent plates which accompany his descriptions. No botanist, even he who limits himself to the study of British plants only, can be without Mr. Darwin's treatise, in which the British Orchids are all described in detail first, and after them some of the most remarkable of the exotic species. For Mr. Darwin proves from his own persevering observations that Lepidoptera do carry the pollen of one Orchid to another; since he watched them and saw them laden with pollen, go to another spike; and in some instances he even saw grains of pollen adhering to the stigma of Orchids, after the visit of butterflies to them.

We thank Mr. Darwin for putting before us so clearly these wonderful details of the workings of Nature, and so far helping us to admire God in His works; in the marvellous combinations and appliances of instinct we find, even in the least of His creatures, and in the never ending beauty of outline and of colour, His beautiful and almighty hand has been broadcast all over the world. But we regret to find Mr. Darwin slow in ascribing to Him alone to whom praise is due, the wonders at which even he stands aghast; when he says, for instance (p. 351)—

"The more I study nature, the more I become impressed, with ever-increasing force, with the conviction that the contrivances and beautiful adaptations slowly acquired through each part occasionally varying in a slight degree, but in many ways, with the preservation or natural selection of those variations which are beneficial to the organism under the complex and ever-varying conditions of life, transcended in an incomparable degree the contrivances and adaptations which the most fertile imaginations of the most imaginative man could suggest with unlimited time at his disposal."

We do not quote this as a sample of Mr. Darwin's style, but only to show his very round-about way of saying: "O Lord, how manifold are thy works! in wisdom hast thou made them all; the earth is full of thy fishes."—Ps. civ. The heavens, orbids, or the beings that swim in a drop of water, looked at through this glass, appear quite different from what they do to him who sees only the creature and forgets Him who made it. So that in this we cannot help differing widely from Mr. Darwin, who we hope is not in earnest when he says, (p. 3) that his treatise—

"Affords an opportunity of attempting to show that the study of organic beings may be as interesting to an observer who is fully convinced that the structure of each is due to secondary laws, as to one who views every trifling of structure as the result of the direct interposition of the Creator."

We are among those. We, too, have studied the works of Nature, in more than one branch of them, and in diverse countries; but this study, breathing as it is, would be to us barren and comparatively idle, were it were merely to trace effects or to watch results without ascribing them all in their smallest details to Him whom we believe to be everywhere present, "without whose will not one sparrow falleth to the ground," and who clothes in the brightest colours the grass of the field, which to-day is and to-morrow is no more; for that in Him they and we all "live and move and have our being." We therefore know nothing of Mr. Darwin's

"secondary laws," if by these is meant that God takes no account of details; but that He, after having once given a general impulse, or after having created a type of a genus or of a race, leaves it to take care of itself, and, as it were, to develop itself in the particulars of its adaptation to the place it occupies in Creation. To hold this is not to believe that the "very hairs of our head are all numbered," or that some detail can be too trifling for Him who made everything, and by whose will, providence, and wisdom all things in Nature have their place, their use, and all sing in harmony to His praise. We believe, therefore, that the same wisdom which orders the type, presides over the further development of it in all its species, and that, for this reason, there is no confusion in Nature.

This is proved to demonstration by all Mr. Darwin's brilliant experiments on the fertilisation of Orchids. If so be this—

shall we call it anomaly—in the management of fertilisation through insects, were an accident in the economy of the work of the Vegetable kingdom, or if it were left to some "secondary law" to take care of itself,—how could it be that there are no hybrids among our Orchids?

Insects, Mr. Darwin tells us, are drawn by day to the Orchids more on account of its colour, and at night to the O. pyramidalis and others through their smell; the smell of small ones, which is we know keen in many insects, and is wonderfully delicate in those which, in the dark, and mistakes one flower for another; and so carry the pollen only to the right Orchid and to no other.

Were it not so, there would result amongst but confusion in the whole order of Orchids,—the distinct species would gradually diminish and the hybrids rapidly increase,—and at last there would not be one true species, nor a distinct genus left.

Whereas, on the contrary, we find that hybrids—some forty odd in the whole Vegetable Kingdom—are very rare accidents among Orchids, if indeed they occur at all. So that not only must we admire the wonderful wisdom of God in attracting to these beautiful flowers for purposes of reproduction the no less brilliant butterflies and moths that frequent them, but we must also admire the instinct these insects have, not to mate, but given them, which guides them alike at night by the smell and in the day by sight from flower to flower without confusion or mistake. Yes, and when we see in this, as in every other detail of nature, not the dumb working of machinery, the mechanism of which is unknown, but the faultless guidance of a pervading Spirit, of God who made, who loves, who keeps it all, and to whose influence and bidding all these yield and obey, the whole Universe from the worlds above to the very dust of the earth below, is at once fraught with a life, a purpose, an interest which the man who sees no God in it can never find. The same hand that poised the earth in space taught the bird to build its nest, and led the butterfly to the Orchid. There is here no secondary law: it is all one. One will, one skill, one wisdom, almighty and infinite, for which there is no detail too trifling, because for it no plan is too great. Now, not only to see but openly to acknowledge this is, or rather ought to be, the delight of the naturalist, who may thus do most good in his generation by raising his fellow-men from the Nature he studies to that Nature's God; and this, not by inference, but in so many clear and distinct terms.

For without Him seen in His works, those works are lifeless; since He alone gives life and being. But when He is seen in them, then all is order and harmony. True, our limited knowledge does not enable us always to follow the chain of creatures link by link; and we sometimes find our ideas of "homologies" abruptly disturbed. But as our knowledge of Nature increases, so also with it do our own views of these homologies, or rather, of this harmony of types, become broader and

rather. We learn to widen the genera, instead of cutting
us up into almost as many genera as there are species, after
the manner of some whose minds cannot grasp the broad
various instances of nature, but only the details thereof,
and who thus multiply the names of every genus and species
to the great confusion of the whole. Such men, instead of
helping the study of Natural History, hinder it. But those
like Mr. Darwin, are less intent on inventing new
names for old things than in making us better acquainted
with them, help us greatly, and deserve our gratitude. We
thank Mr. Darwin for his book, for the additional infor-
mation he has given us as the result of his own experience,
and for the wonderful details of Creation, at which he and
we all marvel.

"For the works of the Lord are great, sought out of all them
that take pleasure therein." Ps. ciii.