DARWIN'S ESSAY ON INSTINCT.

This so-called "posthumous" essay of the late Charles Darwin, which was written thirty years ago, was read at a recent meeting of the Linnæan Society by Mr. G. J. Romanes, to whose forthcoming work on the "Mental Evolution of Animals" it will be added as an appendix. The following is an outline of the paper:—Under the head of *migration* the main points with which Darwin is concerned are—(1) that in different kinds of birds we can trace a perfect gradation from those which, with more or less regularity, change their quarters within the same country, to those which at regular intervals migrate to another country; (2) the same species is found in one country to migrate, and in another not to do so, or migratory and stationary individuals of one species may be found in the same country; (3) the migratory instinct may be resolved into two distinct factors—a periodical *impulse* to travel, and a *sense of the direction* in which to travel; (4) men in a savage state are known to exhibit a sense of direction, lost in more civilised individuals, which may be analogous to that shown by animals; (5) certain birds and animals have truly migratory instincts. On these admitted data Mr. Darwin proceeds to found his theory of the origin of the migratory instinct. This theory is, that the ancestors of migratory animals were annually driven, by cold or want of food, to travel slowly southwards, and that in time this compulsory travelling would become an instinctive passion, as in the case of certain Spanish sheep. In the case of birds, the wings would be used, and if in the course of many generations the land over which they were in the habit of flying in their annual journey were to be slowly submerged, the line of flight would tend to remain unaltered, and we should thus arrive at the state of things which we know now to exist, viz., migratory birds flying over great stretches of ocean.

In regard to another kind of instinct, we are in possession of abundant facts to show that, in the case of man, instinctive *fear* does not exist in a state of nature; it has first to be acquired, and is then lost again under domestication. The feigning of death by insects and spiders is shown to be merely an instinct of remaining motionless, and therefore inconspicuous in the presence of danger, there being no idea of *death*, or the simulation thereof, on the part of the animal.

In respect of a third instinct, that of *nest-building*, many facts show that it is subject to great variation, both in an individual and, in course of time, in a species. Hence Darwin argues—"If it be admitted that the nests of each bird, wherever placed, and however constructed, be good for that species under its own conditions of life, and if the nesting instinct varies ever so little when a bird is placed under new conditions, and if these variations can be inherited, of which there can be little doubt, then natural selection in the course

of ages might modify and perfect almost to any degree the nest of a bird in comparison with that of its progenitors." Mr. Darwin shows likewise that variations of instinct have occurred in animals, as, *e.g.*, the hyæna of South Africa has ceased to make burrows, and so on; and similarly the lodge of the beaver might have been developed out of such a habitation as is made by the musk rat. The author continues—"As there is often much difficulty in imagining how an instinct could first have arisen, it may be worth while to give a few, out of many, cases of occasional and curious habits, which cannot be considered as regular instincts, but which might, according to our views, give rise to such." After doing this, Mr. Darwin proceeds to consider some of the special difficulties of the subject from the point of view of natural selection, and finally sums up the argument in his usual way. His concluding words are—"It may not be logical, but to my mind it is far more satisfactory, to look at the young cuckoo ejecting its foster-brothers, ants making slaves, the larvæ of the Ichneumonidæ feeding within the live bodies of their prey, cats playing with mice, otters and cormorants with living fish, not as instincts specially given by the Creator, but as very small parts of one general law leading to the advancement of all organic bodies—Multiply, Vary, let the Strongest Live and the Weakest Die."

Though this doctrine may not be in accord with our usual lines of thought, there can be no doubt that it is at once more logical (in spite of Darwin's hesitation to make the claim in the sentence just quoted), and more reverent to the Creator, to suppose these things to be but minute details of one general plan, gradually working itself out in the course in which He has set it, than to picture each detail as independently fixed and considered, where, as often happens, the instinct only leads to its possessor's misery or death. It may be added that, as may be gathered from what was said at first, this essay must not be regarded entirely as giving the views of its author as he would have set them forth, had he elaborated the subject with all the wealth of his later knowledge.—W. B. G.

In another paragraph we have referred to the retirement of Professor Owen from his active duties. Still another veteran has signified that he is probably approaching the end of his long scientific labours. In the last number of the "Annals and Magazine of Natural History" the Rev. M. J. Berkeley, in a concluding note to his contribution to "British Fungi," says that he is "glad to be able to make" a certain correction, "as this is in all probability the last of a long series of contributions." How long they have been our readers may form some idea, if we state that they commenced in 1837, in the "Magazine of Zoology and Botany," and that Mr. Berkeley has enumerated in them over 2,000 species of Fungi new to our British Flora.