# POSTHUMOUS PAPER BY DARWIN.

Last night a very crowded meeting of the Linnæan Society was held at its rooms, Burlington-house, to hear and discuss a posthumous essay on "Instinct," by the late Charles Darwin. Among those present were Professor Huxley, F.R.S., Sir John Lubbock, M.P., F.R.S., Lord Arthur Russell, Mr. Justice Fry, Mr. Alfred R. Wallace, F.L.S., Professor Michael Foster, Dr. Crichton Brown, Professor Allman, past president of the Linnæan Society; Dr. Cleghorn, Mr. Francis Galton, F.R.S., Professor Busk, Captain Ramsay, Professor Mivart, F.R.S., Colonel Beddome, Mr. Henry Seebohm, Dr. Rae (from Canada), Mr. Bate, and Professor Ray Lankester, F.R.S.

Sir John Lubbock, having taken the chair, called on Mr. George John Romanes, M.A., LL.D., F.R.S., zoological secretary to the society, to read Mr. Darwin's essay, which was described as being the full text of a chapter penned some 30 years ago by the great naturalist for his epoch-making work, "The Origin of Species," but afterwards kept back, with the exception of certain select passages, for the sake of condensation. It is now understood that it will be found in print in the shape of an appendix to the forthcoming work of Mr. Romanes on the "Mental Evolution of Animals."

The following is an outline of the paper arranged under the several topics treated by the illustrious author:—

Under the head of migration the main points with which Darwin is concerned are—(1) that in different kinds of birds there is a perfect series, from those which occasionally or regularly shift their quarters within the same country to those which periodically pass to far distant countries; (2) the same species often migrates in one country and is stationary in another, or different individuals of the same species in the same country are migratory or stationary; (3) the migratory instinct is made up of two very distinct factors—viz., an impulse to travel periodically and a faculty of knowing the direction in which to travel; (4) savage man shows a sense of direction which may be analogous to that shown by migratory animals; (5) certain cases are on record of birds or domesticated animals having truly migratory instincts—a fact which is specially pronounced in the case of a breed of Spanish sheep. Such being the *data*, substantiated by a number of facts, Mr. Darwin proceeds to consider the problem 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, slowly to travel southwards, and that in time this compulsory travelling would become an instinctive passion, as in the case of the Spanish sheep. In the case of birds the wings would be used, and if in the course of many successive generations the land over which they flew in their annual journeys were to become slowly submerged, the line of flight would remain unaltered and thus we should have the state of things which we now perceive—viz., migratory birds flying over wide stretches of ocean. In regard to instinctive fear, an accumulation of facts are given to show that the fear of man has always first to be acquired in a state of nature, and that under domestication it is merely lost again. The feigning death of insects and spiders is shown to be merely an instinct of remaining motionless, and therefore inconspicuous, in the presence of danger, there being thus no idea of death or of its similation on the part of the animal.

A great array of facts is given to show that the instinct of nest-building is subject to variations, both on the part of individuals, and, in the course of time, on that of species. Hence it is argued, "if it be admitted that the nest of each bird, wherever placed and however constructed, be good for that species under its own conditions of life, and if the nesting instinct vary ever so little when a bird is placed under new conditions, and the varieties can be inherited, of which there can be little doubt—the 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." Applying a similar class of considerations to these as to the nests of birds, Mr. Darwin shows that variations of instinct have occurred in rats, which now uniformly inhabit roofs of houses instead of hollow trees, &c.; in the hyænas of South Africa having ceased to make burrows, and so on. He also shows how the lodge of the beaver might have been developed out of such a habitation as is made by the musk rat. After adducing several unusually striking instances of variation of instincts, Mr. Darwin observes:—"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 adducing several such cases, the essay goes on to consider cases of special difficulty presented by sundry instincts to the theory of natural selection. These are all treated with characteristic candour, and in presenting them the essay draws to its summary and conclusion.

PROFESSOR HUXLEY, being called upon to open the discussion, said it would be very presumptuous for any person having heard a mature work of their venerated friend Mr. Darwin under the circumstances in which they had been placed—namely, without an opportunity of considering it and thinking over the whole of its contents—to offer any observations about it. He could not but think, however, that this was not a matured work of Mr. Darwin's, but consisted simply of a series of notes made for his own use out of the immense stores of information which he had acquired, and which he intended to digest and bring into complete harmony with his great scheme as published in "The Origin of Species." Professor Huxley would not have been sorry had the paper been left in the unfinished, unpublished state in which Mr. Darwin left it. (Hear, hear.) It had added nothing to the ideas which already obtained on the nature of instinct, and the illustrations were not of so unknown, rare, and unheard-of a character as to help them to any further comprehension than they already possessed of the extraordinary phenomena which had been grouped together under the name of instinct. He knew of no subject more interesting than this, from its bearing upon the intellectual phenomena of the higher animals, man in particular. Any discussion of this subject from Mr. Darwin would have been profound and valuable, and would have thrown light on one of the greatest chapters of scientific inquiry; but the paper was simply a series of statements, many of which were familiar to most of them, and many cases were difficult to reconcile with the view of creation, or the world of life, which was a phrase he preferred, which proceeded upon the hypothesis of use, either individual or special. In regard to some of these it might be said that there was not a clearer illustration of the view that the world was not constructed upon any plan which did, upon any attentive consideration, produce amiable feelings in the breast of the philanthropist. The world was hard, full of struggle and pain; it was a world in which the weakest went to the wall; where there was a waste of life and of suffering absolutely incommensurable with the results obtained. Mr. Darwin would, no doubt, on careful consideration, have modified many of the views expressed in the paper, and he rather regretted that in this unfinished state it should have been given. (Cheers.)

PROFESSOR ALLMAN expressed the opinion that the great value of the paper lay in the fact that the different cases of instinct mentioned in it had been accepted by Mr. Darwin from observations of his own and others. They knew his judgment and skill in observation, and what a truthful record he made of his observations; they might, therefore, accept without hesitation both the instances noted in the paper which were the result of Mr. Darwin's observations and also of those which he had accepted from others. He referred especially to the cases given of the change, modification, or absolute disappearance of instinctive fear in animals as being exceedingly interesting, and gave the result of some recent observations made by the resident physician in the Seychelles Islands in which birds, coming from localities far from the sea, were found to be perfectly tame and without fear of man.

MR. A. R. WALLACE called attention to the fact that the paper was written some 30 years ago, and that since then considerable light had been thrown upon many of the phenomena noted. No doubt if Mr. Darwin had written recently he would have considerably modified his views upon many of them. There was, to his mind, a considerable amount of obscurity about what was really meant by instinct. It included a considerable number of phenomena, some of them mere results of muscular and nervous co-ordination, and in other cases simply the results of observations and experience. Referring to the supposed instinct guiding the migration of birds, he said the present state of facts tended to show that there was no such power at all, but rather led to the belief that this migration was one of the means of getting rid of the enormous surplus of bird population, as it had been proved, especially by the observations promoted by the British Association at lighthouses and Heligoland, that of the vast numbers of birds which sought to pass from one region to another only a small proportion survived. Many other points in the paper were criticised as pointing to imperfect observation.

PROFESSOR RAY LANKESTER wished to know whether Mr. Wallace abandoned the supposition of instinct altogether. He thought there were many instances which might be adduced which could not be accounted for on the theory of observation or of having learnt from others, and referred especially to certain habits of the caddis fly in support of his contention. He asked, also, why birds, for example, should go to the west and not to the east in their migration.

These things required further investigation, and they must not draw any conclusion from what had been brought before them, as that the phenomena referred to were, if necessary, to be explained by instinct or the reverse.

PROFESSOR MIVART, Dr. MICHAEL FOSTER, and other speakers followed.