NATURE CONSERVATION IN BRITAIN

ALMOST exactly five years have elapsed since the Nature Conservancy was constituted by Royal Charter "to provide scientific advice on the conservation and control of the natural flora and fauna of Great Britain; to establish, maintain and manage nature reserves in Great Britain, including the maintenance of physical features of scientific interest; and to organize and develop the scientific services related thereto". It is therefore a matter of some interest that the first two reports[1], one relating to the work of the Conservancy up to September 30, 1952, the second for the year ended September 30, 1953, have recently been published. It is to be hoped that the form of the second of these reports justifies the assumption that, as laid down in Section 24 of the National Parks and Access to the Countryside Act, 1949 (12, 13 and 14 Geo. 6, Ch. 97), the Nature Conservancy will "as soon as possible after the thirtieth day of September in each year, make to the Lord President of the Council a report on the discharge by them of their functions during the period of twelve months ending with that day".

Although to some extent the way has been paved for the Nature Conservancy by the pioneer work of the Royal Society for the Protection of Birds, the National Trust, the Society for the Promotion of Nature Reserves and a few other and more local societies, nevertheless the Nature Conservancy faces a formidable task, and one which seems likely to become more and more difficult of achievement as the impacts of new claims for land, and of modern techniques of land usage, reach their maximum demands. Many of the most interesting species of plants and animals of Britain have already become restricted, as a result of agricultural development and of urbanization, to marginal lands. Now these same retreats are the objects of competition among hill graziers, foresters, new industries and the Armed Forces. Moreover, the Nature Conservancy was constituted immediately following a succession of years during which dramatic changes were imposed upon many areas under the demands of war-time economy. War agricultural committees drained and ploughed much land which had never before been cultivated, huge acreages were disciplined into landing fields, industry was dispersed widely into former rural areas, and battle-practice schools took over many square miles of land as gunnery and bombing ranges or for manœuvres with armoured vehicles.

It is not surprising, in view of this, that, despite the preparatory work of the Nature Reserves Investigation Committee and, following that, of the Wild Life Conservation Special Committee, it has proved necessary to organize a complete survey of England and Wales in order to determine the conditions now existing, and so to provide, as it were, an up-to-date register of the status of the wild life of the country, and at the same time to determine what measures may now be necessary in order to conserve what we have left of it. It is satisfying to read that such a survey was very nearly complete by 1952, and by September 1953 more than one thousand sites had been listed in England alone as being of sufficient importance to merit notification to local planning authorities under Section 23 of the 1949 Act. The protection granted thereby is by no means complete, but it ensures that the Conservancy will be consulted before any new development is permitted which may modify the conditions within such a listed area.

In a country so small and densely populated as Britain, the establishment of Nature reserves is not lightly to be undertaken. Land is a scarce commodity, and its use must be fairly and wisely allocated among the many claimants for it. Moreover, the proper maintenance of a reserve for scientific study demands the goodwill and understanding of the public. Some reserves have been maintained for many years, notably under the ægis of the National Trust and by such bodies as the Royal Society for the Protection of Birds, the Society for the Promotion of Nature Reserves and the Norfolk Naturalists' Trust; readers of the present reports will note with satisfaction the mutual co-operation which the Conservancy has established with these bodies. The establishment of new national reserves is proceeding commendably slowly in view of the need for very careful selection. The view expressed in the second report by the Conservancy that this rate is disappointingly slow may be discounted. Eleven sites have been declared in England and Scotland, and another twelve acquired too recently for declaration to have been completed by the end of the Conservancy's year. By far the largest are the Beinn Eighe Reserve near Loch Maree and the Moor House property in Westmorland, both of which comprise some 10,000 acres. The remainder are smaller areas, many of them reserved for their special interest, such as the famous yews of Kingley Vale, the breck conditions of Cavenham Heath, the fens, broads and sand-dunes of various Norfolk and Suffolk sites, and the remarkable broken cliff conditions of the Dowlands landslip in east Devon. Some of these have already been in the care of a national or local society, which has now transferred the trusteeship to the Conservancy; others have been leased or purchased, while yet others, including the sites of both the Piltdown and the Swanscombe skulls, have been presented.

Section 21 of the 1949 Act empowers local authorities, in consultation with the Nature Conservancy, to create local Nature reserves. Little surprise will be expressed that to date very few authorities have taken such powers. One Scottish and two English county councils have, however, shown their practical interest, and it is not over-optimistic to expect that the number of such local reserves may increase steadily, if but slowly. No doubt the still existent framework of the old Nature Reserves Investigation Committee's county sub-committees can be of use here, in bringing to the attention of their local authorities habitats which require protection and for which the establishment of a local reserve may be feasible.

The wider functions of the Conservancy, namely, the provision of advice upon, and the promotion of research into, the conservation and control of natural populations, present a multitude of problems, not the least of which is our fundamental ignorance of the ecological factors which determine the status of even the commonest of our animals and plants. The science of ecology is still young, and the rate at which

its study yields comprehensive results must be slow, because of the nature of its material and of the intricacy of the complex of physical and biotic factors within which all living organisms exist. It seems, therefore, that the Nature Conservancy may for some years be at best a one-eyed adviser, except where problems relate to only the most simple factors. It is relevant to emphasize that in the case of each of the four examples quoted in the first report no adequate answer could be returned. In fact, the reply was virtually, "We do not know, but we will try to find out", and research has been initiated in an effort to discover the solution.

To biologists therefore, as indeed to all who are prepared to take an objective view of conservation, the most interesting and stimulating sections of these two reports are those announcing the establishment and organization of the Conservancy's own research stations, at Merlewood, with Moorhouse at its doorstep, at Anancaun in the Beinn Eighe Reserve, and at Furzebrook in Dorset. Coupled with this must be Appendixes V, VI and VII to the second report, in which are listed the grants awarded to universities and other organizations for the development of research into specific field-problems. One of the strongest deterrents to the initiation of fundamental ecological research, particularly in relation to animal populations, has been the breadth of the task which must be faced. Even the so-called autecological study of the bionomics of a single species must involve the investigator in an infinitude of problems in which the physical factors of climate and microclimate, geology and soil structure and physiography may be involved, while willy-nilly an extensive study of the lives and relationships of a greater or lesser number of other species must be examined in order to determine the nature of their influence upon the species in which the worker is primarily interested. He must therefore be equipped in some measure as meteorologist, pedologist, taxonomist and statistician, and in a host of other techniques. Few men and women are able to attain to this width of interests, and in practice aid is sought from other experts in the solution of the many problems which have to be examined.

Synecology—the study of whole habitats and of the total assemblages of plants and animals within them—presents a still greater complexity of pattern, and demands so high a degree of concentration, knowledge and labour that few investigations of this kind have been successfully concluded. Nevertheless, the autecology of any species cannot be elucidated without reference to the synecology of the habitat in which it lives. It follows, therefore, that the ultimate aim of ecological science must involve a detailed synecological picture of at least the major habitats of the world. Only then will it become possible to assess correctly the status of the individual species; and, from the point of view of human welfare, only then will it become possible to prophesy the consequences to be expected from any attempt to modify the status of a species, whether by encouragement, control or, in the final event, extermination.

It seems logical to expect that comprehensive ecological knowledge can only be attained through the work of teams of experts in groups of related fields, and it is therefore encouraging to observe the nucleus of one such team being created in the scientific staff of the Nature Conservancy. It is to be hoped that, once the organization has escaped its growing pains, its scientists will be freed from all but the necessary minimum of administrative and advisory duties, in order that they may concentrate on research. Concurrently, the programme of assistance to universities and to reputable naturalist organizations is warmly welcome. There is a wealth of talent among amateur naturalists, about which they themselves are frequently unduly humble. The exact observer who is prepared to devote his leisure to the ordered study of an area, or of a group of animals or plants, can, and does, make as important contributions to biological knowledge as do many professional scientists. Indeed, the increased load of administrative and teaching duties which besets the university teacher is usually now so heavy as virtually to preclude him from spending sufficient time, at the right times, in the field. As a result, much of his ecological work must be done by proxy. It is here that the training and research grants made by the Conservancy to university departments are so important. Thus, not only is a continual stream of apprentice recruits provided, but also the experienced ecologist is enabled to stimulate and direct work for which he himself no longer has time or freedom.

In conclusion, it is relevant to refer to the 1947 report of the Wild Life Conservation Special Committee[2]. This committee examined the problem which has been adumbrated in the foregoing paragraphs, and made a number of recommendations, of which the most stimulating was perhaps that mooting the idea of freedom of movement of members of staff between museums, the Nature Conservancy and university departments. The ecological worker would thereby gain a wide experience of different disciplines, techniques and methods of attack upon his problems. Such increased versatility is so patently desirable as to create the hope that the idea has not been pigeonholed and forgotten.

L. A. HARVEY

[1] The Nature Conservancy. Reports of The Nature Conservancy for the period up to 30th September 1952. Pp. iii+33. 1*s*. 3*d*. net. Report of The Nature Conservancy for the Year ended 30th September 1953. Pp. iii+31. 1*s*. 3*d*. net. (London: H.M. Stationery Office, 1953.)

[2] Conservation of Nature in England and Wales. Cmd. 7122. (London, 1947.)

RECENT ADVANCES IN ANIMAL MORPHOGENESIS

THE conference sponsored by the editorial board of the *Journal of Embryology and Experimental Morphology* and held in London during January 9–12 permitted a large number of biologists to hear and discuss accounts of recent work on many major aspects of animal morphogenesis. For this opportunity they were primarily indebted to their Continental colleagues, whose participation has provided an important stimulus to British interest in this field.

That rewarding work may still be found in the exploration of the classical problems of embryology was shown by Prof. J. Pasteels (Brussels), who described the first fruits of an investigation of embryonic stages of reptiles from the Belgian Congo. He has been able to show that the migration of the primordial germ cells to the gonadal ridges by a vascular route, long known in birds and *Sphenodon*, occurs also in lacertilians. A study of body form and brain morphology in species of different habits showed that relative functional importance in the adult can be anticipated by the embryo at a remarkably early stage. The brains of embryo