than by other interests, whether scientific, agricultural or amenity—that Great Britain is a small island, and land is a precious commodity, second only to man-power in its scarcity, and demanding equally the utmost judgment and economy in its use.

It is probably still too early to assess how great and irreparable is the damage already caused to flora and fauna, apart from amenities, in those 750,000 acres which the Services are preparing to release. That some of the damage was avoidable and some even wanton is undeniable. Too much has been lost already for the danger to some of our first potential nature reserves—breeding places of rare birds, migrants and insects—involved in some of the latest proposals to be disregarded lightly, and on that ground alone scientific men should seek every opportunity of making their protest heard in company with those made on other grounds. It is, however, on the ground of spiritual values, on which the present Master of Trinity based his appeal for national parks, that the final objection must rest. If, as Dr. Trevelyan said, natural beauty stands by the side of religion, of science, of poetry and art, not as a rival but as the common inspirer and nourisher of them all, and with a secret of her own, a nation which fails fairly to take account of such values in determining its national policy will assuredly find that neither guns nor butter can repair the atrophy of the spiritual power of the people.

GALL MIDGES AND AGRICULTURE

Gall Midges of Economic Importance

By Dr. H. F. Barnes. (Agricultural and Horticultural Handbooks.) Vol. 1: Gall Midges of Root and Vegetable Crops. Pp. 104+10 plates. 12*s*. 6*d*. net. Vol. 2: Gall Midges of Fodder Crops. Pp. 160+4 plates. 15*s*. net. (London: Crosby Lockwood and Son, Ltd., 1946.)

THE gall midges or Cecidomyidæ are a family of rather primitive, structurally degenerate Diptera, of very small or minute size. They derive their name from the fact that the majority of species during their larval stages are plant-feeders which induce in their hosts the malformations termed galls or cecidia. But the family contains many more generalized species which live on fungi or in decaying plant material; and a few are carnivorous, preying upon scale insects, mites, white-flies, other gall midges and the like, letting the blood of their victims so neatly that an aphid may be bled to death without perceiving the attack.

Among the gall midges are many that attack cultivated crops, often causing serious losses. Perhaps the best known of these is the Hessian fly which, according to tradition, was introduced into America in straw bedding used by the Hessian troops during the Revolutionary War. Though not a common cause of serious trouble in Great Britain, the Hessian fly is often responsible for much damage to wheat crops in the United States and elsewhere, and attempts are being made to produce varieties of wheat that are resistant to it. In the British Isles perhaps the swede midge, the pear midge, the clover seed midge and the chrysanthemum midge are the most harmful representatives.

In spite of their biological interest and economic importance, the gall midges as a group have scarcely received from entomologists the attention they deserve—although a few of the injurious species have been intensively studied. Much of the literature about them is difficult of access, and although there are monographs describing and classifying the species of gall midges, a reference book containing the biological and economic information available about them has been lacking.

Dr. H. F. Barnes has set himself the task of writing a comprehensive account of all those species of gall midges, throughout the world, that are of economic interest either as pests of crops or as beneficial insects. He is well qualified for this task; for not only is he a taxonomist of international repute on this group of insects, but also his researches during the past twenty years have added greatly to our knowledge of their biology, their economic importance and the factors which determine the fluctuations in their numbers, the host-plant range of phytophagous species, the choice of prey among the predators—all problems of general biological interest.

The entire work will comprise an unspecified number of volumes, each complete in itself, dealing in turn with the gall midges of the various groups of crops. The first two volumes, dealing respectively with the midges of root and vegetable crops and the midges of fodder crops, clovers and grasses, have now been published. The midges are dealt with under the plants they attack, arranged alphabetically. The author is acutely aware of the pitfalls and difficulties that beset the path of the taxonomist of this group of little flies. He deprecates any attempt by the amateur to identify the species independently of their host plant and of the type of damage they produce, for "experience has shown that it is frequently more or less useless, and usually most unwise, to attempt to identify a species from keys unless biological data are available in addition". To emphasize this, the briefest possible description of each species is given, though reference to the original description is always included. Throughout the work it is the bionomics of the insect that is stressed; the information on the biology and habits of the species of economic importance should enable entomologists to identify them.

The injurious species of gall midges present particularly difficult problems to the economic entomologist, for direct methods of control are seldom practicable, and cultural methods of prevention have to be found. Detailed knowledge of its biology and life-history is a prime need in seeking means of control for any insect pest; but this applies with special force to pests that must be dealt with by cultural methods. To devise modifications in farming or gardening practice that will enable the crop to resist attack demands an intimate understanding of the relation between the insect and its plant host.

The author has brought together in a compact form all that is at present known along these lines about the gall midges that are pests in all parts of the world, and has directed attention to the many gaps that still exist in our knowledge. His books make no pretence to literary form: they are concentrated, fully documented accounts of known facts. But they are welcome both in providing entomologists with a ready means of reference to the information already acquired and as a stimulus to the further study of an important but somewhat neglected group of insects.

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