

Recent Caterpillar Plagues in Great Britain

THE epidemic occurrence of the caterpillars of the Antler moth (*Charæas graminis* L.) in the north of England and Scotland, and of the Willow 'Small Ermine' moth (*Hyponomeuta rorella* Hb.) in Suffolk, have been the subject of considerable comment, not to say confusion, in the daily Press, and since the two outbreaks are of a very different type a brief account of their essential features may be of interest.

The species first mentioned is widely distributed throughout Great Britain, haunting chiefly moor or downland, and the poorer types of pasture, where the larvæ feed on *Festuca ovina*, *Nardus stricta*, and grasses of a similar type. In lowland regions, the Antler moth appears never to increase to such numbers as to do appreciable harm; but in hill districts from South Wales and Derbyshire northwards, moorland pastures, usually at a considerable elevation, may suffer very severely, the grasses being largely destroyed and only a brown 'mat' of dead grass left. The caterpillars then occur in such numbers as to be driven by starvation to migrate in vast hordes, blocking streams and water courses, or collecting in heaps at the base of walls or other obstacles. This migratory stage, if that term be applicable, is reached when the caterpillars have nearly completed their feeding, and although a certain proportion crawl downhill towards the lowland meadows, the latter never seem to be damaged. Antler moth outbreaks occur relatively infrequently, as the following records show, although there may have been others on a smaller scale of which records have been overlooked, notably between 1827 and 1881:

- 1827 Skiddaw¹.
- 1881 Lancashire (Clitheroe)², Derbyshire⁶.
- 1884 Glamorgan³.
- 1885 Selkirk⁴.
- 1894-95 Selkirk and south-west Scotland⁵.
- 1910 Glamorgan⁶.
- 1917 Derbyshire⁶.
- 1935 Wales (Brecon).
- 1936 Brecon Beacons and Cader Idris, north-west England.
- 1937 Cader Idris (slight compared with 1936), north-west England, Scotland.

It is evident, therefore, that outbreaks seldom occur for more than two years in succession in the same area, and often they are confined to single years with long intervals in between. The factors

that lead to these enormous increases in numbers are at present unknown. The outbreak in Derbyshire in 1917 was investigated by Imms and Cole⁶, and they suggested that these factors were possibly climatic, and the fact that the hills were snow-covered in 1916-17 might have given the species greater protection during that winter. Since, however, the insect spends this season in the egg stage (a fact not then known) this explanation is not very likely to be correct. An alternative suggestion discussed by Imms and Cole was that the failure to burn hill pastures during the Great War had favoured the outbreak, but again this explanation can scarcely apply generally, and it is more probable that the causes of an outbreak are complex and due to the interaction of both climatic factors and the varying incidence of the natural enemies of the moth.

The matter clearly needs investigation; but owing to the considerable period of years that may elapse between outbreaks and the necessity for intensive field and laboratory work every year, regardless of outbreaks, the problem would seem to be more appropriate to a university department with a succession of students than to a research worker in economic entomology, who would not be able to give annually so large an amount of time required to a problem that, taken over an average of years, is not of great economic importance. So far as direct control measures are concerned, nothing of a practical nature is yet known, since the value per acre of moorland grazing is so small that it will not carry any appreciable expenditure on caterpillar control.

The Antler moth outbreaks are thus typical of a resident species that normally occurs in small numbers, but is occasionally released from the factors that exercise a natural control.

The outbreak of the other species attracting attention, the Willow Small Ermine moth (*Hyponomeuta rorella*) is of a different character. This moth, until 1936, was regarded as a very rare species in Great Britain, having been noted only in Sussex and Dorset, and even in these counties there seems to be no record of any permanent colony. In 1936, however, the marshland willow trees in the neighbourhood of Beccles in Suffolk were found to be heavily infested by the larvæ, and specimens were also received from Barnby, farther down the Waveney valley, while a single specimen was taken at Rockland Broad in the valley of the Yare in Norfolk, some twelve miles from Beccles⁷.

According to Goldsmith, who first recorded the Suffolk outbreak⁸, larvæ had been noted at Beccles some five years before his attention was directed to them. It is thus possible that there may have been a small nuclear colony of the species in Suffolk for many years. This, however, is not very likely, since the Beccles neighbourhood has been fairly well worked in respect of the Lepidoptera, and the 'nests' of the larvæ are so conspicuous that they could scarcely be overlooked. On the whole, it is more probable that the species is a recent arrival in Suffolk, having either flown or been carried by boat from the Continent.

If this suggestion is correct, the conditions favouring an epidemic increase might easily have been fulfilled, since the moth would arrive without its natural parasites, and feeding upon willows in a marshland district, where other members of the genus are not abundant, it would gain some years' start before being found by any indigenous parasites. In 1936, the rate of parasitism was certainly very low. Mr. Stringer, of the British Museum (Natural History), reared from Beccles larvæ the species *Herpestomus brunneicornis* Grav., an ichneumonid that frequently attacks the allied *Hyponomeuta padella*; but the writer obtained no parasites whatever either from Beccles or from Barnby material.

Provisionally, then, *H. rorella* may be regarded as an invader (in contradistinction to the indigenous *C. graminis*), and although it is very unsafe to prophesy, it is at least possible that it will be increasingly parasitized, and even perhaps brought completely under control as soon as it is discovered

by the parasites of our native species of *Hyponomeuta*—a process that might be hastened artificially if it were considered worth while.

As to the economic importance of the insect, it is not possible as yet to give any definite opinion. If cricket bat willow or basket willow were attacked, the species might prove a serious menace, notably to the former, since the spraying of large trees is seldom commercially worth while. Fortunately, there is some hope that neither will be affected. In Suffolk, the trees that are suffering appear to be *Salix alba* (although the writer claims no expert knowledge in this respect). However this may be, larvæ of the *rorella* brought from Beccles, and also others reared in captivity from the egg, have been given the foliage of the true cricket bat willow, but neither in 1936 nor 1937 were they able to survive on it. Similarly, they refused to feed on *Salix caprea* or other 'sallows', or on one of the basket willows that was given them. The experiments were not sufficiently extensive to justify any final conclusion in respect of the cricket bat willow, but they are at least suggestive and show that *H. rorella* is very specific in its tastes.

A note on the outbreak in 1936 was published in the *Entomologist*⁷, to which readers may be referred for a description of the larvæ and the damage they do. J. C. F. F.

¹ Curtis, "Farm Insects", 507 (1883).

² Ormerod, "Report on Injurious Insects", 21 (1881).

³ *ibid.*, 16 (1884).

⁴ *ibid.*, 12 (1885).

⁵ *ibid.*, 12, (1894); 18 (1895).

⁶ Imms and Cole, *J. Board Agric.*, 24, 516 (1917-18).

⁷ Fryer, *Entomologist*, 69, 269 (1936).

⁸ Goldsmith, *Entomologist*, 69, 217 (1936).

Nottingham Meeting of the British Association

AS has already been announced, the annual meeting of the British Association will this year be held in Nottingham on September 1-8, under the presidency of Sir Edward Poulton. Twice previously the Association has held its annual meeting in Nottingham. In 1866, before the foundation of University College, Nottingham, Mr. Justice Grove, Q.C., the inventor of the Grove cell, was president. It was at this meeting that Wheatstone was president of Section A (Mathematics and Physics), before which Joule read a short paper on the heating effect of an electric current in a wire, and one wonders if this paper was an abridged version of that which Wheatstone is reputed to have rejected in his capacity as a referee for Royal Society publications. At the same meeting, Sir William Huggins gave an evening

discourse on the applications of spectroscopy to the problems of stellar constitution. Among the more distinguished members present in 1866 were Frank Buckland, T. H. Huxley, A. R. Wallace, W. Crookes and H. E. Roscoe, while Dean Farrar contributed to discussions on the teaching of science in public schools, and C. F. Varley reported on the Atlantic cable successfully completed a month before the meeting. Among the visits paid to local industrial undertakings was one to Messrs. Taylor's bell foundry in Loughborough, and it is pleasant to think that members will again have an opportunity of visiting the works this September.

In 1881 the University College, Nottingham, buildings in Shakespeare Street, near the centre of the city, were opened, and these were the headquarters of the Association at its annual meeting