

Insect Pests in England and Wales*

A RECENT official report on crop pests in England and Wales covers the years 1928-31 and forms *Bulletin* 66 (1933) of the Ministry of Agriculture and Fisheries. In this publication, Mr. J. C. F. Fryer, director of the Ministry's Plant Pathology Laboratory at Harpenden, reviews the general position over the period mentioned.

In methods of pest control, definite progress is evident with regard to enemies of fruit and other horticultural crops. The English grower to-day, provided he can achieve the desired result, adopts insecticidal measures on a scale as thorough as those employed in the Dominions and the United States. The progressive man realises that, to produce good sound marketable fruit, spraying is not merely an advantage, but is also an absolutely essential part of cultural routine.

In the use of dry sprays or dusts Great Britain is, however, a long way behind. It is nevertheless becoming recognised that they have definite advantages in point of ease and speed of application and reduced costs. Their adoption does not seem likely to come into practice until certain initial difficulties have been overcome. Many of the improvements in control measures have resulted from investigations carried out by members of the Research and Advisory Services of the Ministry of Agriculture. New winter spray fluids have emanated from the Long Ashton Research Station.

Much work has been done in connexion with pyrethrum. It has been shown that this plant can be grown satisfactorily in many parts of England. The problem as to whether the growing of the crops is an economic proposition is now being tried out. At Rothamsted, progress has been made in methods of evaluating the toxic principles found in the pyrethrum flowers. Also, experiments have been conducted with pyrethrum sprays in connexion with horticulture, which show promise, and there is little doubt that considerable developments in this direction are probable.

The entry of foreign pests through the agency of

commerce, or other means, forms the second part of this *Bulletin*. During the period under review the apple fruit fly (*Rhagoletis pomonella*) was detected in consignments of low grade apples from the United States. Since it is a serious pest, likely to thrive under English conditions, the Ministry issued the Importation of Apples Order 1930 entirely prohibiting the entry of certain grades of apples from the United States within a specified period each year. Among other immigrant pests the cherry fruit fly, chrysanthemum midge and cottony cushion scale are briefly noticed. Reference is also made to an introduced insect of a beneficial character, namely, the chalcid wasp *Aphelinus mali*. This insect has proved itself at times to be capable of controlling the woolly aphis under English conditions. Whether it is capable of persisting from year to year is very uncertain, and it appears to have failed in many cases owing to unfavourable climatic conditions. It is therefore still doubtful whether this useful parasite can be permanently acclimatised or whether it will need to be reintroduced every few years from colonies grown under protected conditions.

The major part of the *Bulletin* is devoted to a review of the prevalence of each specific crop pest during the four years under consideration. The attacks of cereal and grassland insects, for example, were, on the whole, below the average. Vegetable enemies, especially root flies, caused a good deal of destruction in various parts of the country but the most serious pests were those affecting orchards. Especially injurious were the apple capsid and the apple sawfly. Among strawberry pests the 'red spider' (*Tetranychus telarius*) was very destructive in 1929, when it appeared for the first time in epidemic form: in subsequent years it showed a marked decline. Mention needs also to be made of the great prevalence of the aphid, *Myzus cerasi*, on cherries in Kent which was a feature in 1928: severe infestations also occurred in the south-west of England during 1931.

The *Bulletin* concludes with a useful list of papers published during 1928-31 in various journals and bearing upon subjects dealt with in its pages.

A. D. I.

* Ministry of Agriculture and Fisheries. *Bulletin* No. 66: Report on Insect Pests of Crops in England and Wales, 1928-1931. Pp. vi+50. (London: H.M. Stationery Office, 1933.) 1s. net.

Petrogenesis of the Newry Igneous Complex

IN her paper on "The Eastern End of the Newry Igneous Complex", which was read before the Geological Society on February 7, Miss Doris L. Reynolds made a contribution to petrogenesis of outstanding importance. The rocks described are types common to many orogenic regions, and include peridotite, biotite-pyroxenite, augite- and hypersthene-monzonite, augite-biotite-diorite and granodiorite. These are convincingly shown to be derivatives, not from basaltic or granitic magmas (gabbro and granite being absent from the area), but from three primary sources, two of which have hitherto remained unsuspected. The three parental materials now recognised are (a) ultrabasic magmas rich in potash; (b) Silurian sediments which became fused by contact with the latter; (c) a magma represented almost entirely by plagioclase. The conclusions reached are supported by a suite of

detailed analyses made by Mr. L. Theobald and Prof. H. F. Harwood.

The earliest intrusions were peridotite and biotite-pyroxenite, the latter representing a residual magma produced by the abstraction of early-formed olivine and pyroxene from peridotite magma. The ultrabasic magmas rose into graywackes and shales and became surrounded by a zone of selective fusion now represented by a fine-grained massive rock that is seen in all stages of development.

The ultrabasic magmas, which were too dense to rise by stoping, came into place partly by shouldering aside the enclosing sediments, as shown by the way in which the strike lines deviate from the regional Caledonian trend and curve round the contacts, and partly by soaking into the overlying zone of fusion, thus giving rise to augite-monzonite.

Simultaneously with, and also subsequent to, the

intrusion of the ultrabasic rocks, a plagioclase magma invaded and hybridised them with the production of augite-biotite-diorite. The latter rose in turn into the zone of fusion, giving rise to hypersthene-bearing monzonites and diorites.

The granodiorite appears to have risen by stoping, since it is rich in xenoliths of the earlier hybrids and cuts across the sediments in the north-east. In places it transgresses the zone of fusion and contains xenoliths of the fused sediments. Textures and mineral and chemical composition unite in suggesting that the granodiorite is essentially a mixture of sediments and plagioclase magma with a little biotite-pyroxenite. For the most part, it clearly formed in depth and afterwards rose into its present position. The porphyritic granodiorite of Cam Lough Mountain in the west of the Complex represents the simple soaking of plagioclase magma into fused sediments.

An animated discussion followed the reading of the paper. A number of speakers, including Dr. W. Q. Kennedy, Dr. H. H. Thomas, and Mr. W. Campbell Smith, seemed suspicious about the existence of a plagioclase magma, and it was asked whether a granite magma might not be competent to produce the observed results. Miss Reynolds pointed out that since the augite-biotite-diorite is a normatively undersaturated rock almost free from quartz, it is impossible that the addition of granite to the biotite-pyroxenite could have produced it. That the plagioclase came in as a magma is indicated by the observation that it has dissolved all the iron ores with which it has come into contact in the biotite-pyroxenite. From the analyses it was found that the magma is composed of about 80 per cent plagioclase, with iron ores and biotite making up the balance.

Prof. A. Holmes suggested that elsewhere there is ample evidence of plagioclase magma in the existence of anorthosites. Such magma is likely to be very hot, and by syntaxis with crustal rocks it would readily grade into syenitic magma, thus providing a wide range of felspathic magmas. Questions of origin

are purely speculative, but this does not mean that the plagioclase magma traced by Miss Reynolds is in any way hypothetical; its behaviour and products are demonstrable facts of observation. He welcomed the new light that the evidence from Newry will throw on the less tractable problems of volcanic fields such as that of Bufumbira. The lavas of that region include potash-rich limburgites in which he had recognised the volcanic equivalent of biotite-pyroxenite. Leucite-basanites developed by the incoming of plagioclase, and by the further addition of sialic material latites and hypersthene-trachyandesites were generated.

Prof. A. Brammall pointed out that while the well-known Hollybush diorite of the Malverns might theoretically be referred to the granitisation of greenstones, neither field nor geochemical evidence sustains this view; all the evidence points to a genetic linkage with the biotite-pyroxenite that is present in the area. The formation of the diorite requires the addition to the biotite-pyroxenite of a magma composed of 60 per cent of andesine and rich in iron ores.

As illustrations of other igneous assemblages where there are signs of an ancestry comparable with that of the Newry Complex, Miss Reynolds cited the Loch Ailsh Complex of Scotland, the provinces of Monzoni and Predazzo, the Trondhemite-Opdalite Series of Norway, the Cortlandt Series of the Appalachians and various examples in the Western Cordillera of North America, including the Rossland Complex described by Daly. She directed attention to the noteworthy fact, hitherto obscured by faulty nomenclature, that true gabbros are characteristically absent from many of the plutonic complexes of folded regions. Referring to the occurrence of monzonites and diorites as individual intrusions, Miss Reynolds suggested that hybridisation, which is known to have taken place at shallow depths, implies more intense activity at greater depths, resulting in the production of actual magmas capable of intrusion to higher levels.

Magnetic Recording and Reproducing in Broadcasting

AT the Paris Universal Exhibition of 1900, Poulsen demonstrated his telegraphone as a magnetic speech recorder for use in a telephone circuit. The apparatus, in its earliest form, consisted of a steel wire or ribbon, which was passed between the poles of an electromagnet, the windings of which were supplied with the audio-frequency currents to be recorded. As the wire was drawn slowly through the field of the magnet, it received therefrom a series of transverse magnetisations corresponding to the sounds received. On the completion of the record, the process could be reversed, and by passing the steel wire between the poles of another magnet connected in series with a telephone receiver, the speech was reproduced.

Various improved forms of the apparatus were developed during the next few years, and among these was one due to Pedersen, who in 1902 succeeded in recording two telephone messages simultaneously on one steel wire, and afterwards reproducing them separately in two receivers. In general, however, the telegraphone, like many other inventions, found little application in connexion with communication technique, until it was given a new lease of life by the introduction of broadcasting.

It is now several years since the Blattnerphone, a modern form of this magnetic recorder, was introduced for recording speech and sections of programmes required for broadcasting purposes. It soon became apparent that the magnetic recording system had important advantages over the use of films or wax discs for this purpose. Among these advantages are the freedom from chemical processes, and from delicate mechanical adjustments, and also the facility with which the recording strip can be 'cleaned-up' for repeated use.

The latest form of this apparatus for commercial use in Great Britain, known as the Marconi-Stillé equipment, formed the subject of an article in the *Wireless World* of January 5, and was also demonstrated by Marconi's Wireless Telegraph Company, Ltd. at the recent Physical Society's exhibition. The Marconi-Stillé machine provides an uninterrupted record of thirty-five minutes duration; and it incorporates the necessary mechanism for driving the steel tape at a uniform speed through the electromagnetic apparatus, which produces a varying magnetic flux in the tape in the case of recording, or translates the magnetic record into currents of varying amplitude for reproduction purposes. The