

Crommelin's tables gives results which are sufficiently accurate; but the example, while illustrating the application of the new method, is not a fortunate selection to show the weakness of the old method in which time is the independent variable. Merton shows how the tables of Crommelin for comets, and also those of Stracke for approximate minor-planet work, can be easily modified to suit the proposed new method. But, in addition, new arrangements in the old tables are essential; in particular, smaller intervals around perihelion are necessary, and  $3^\circ$  intervals here would suffice for all practical purposes.

Various other modifications are suggested, and possibly the new scheme will be tried as soon as practicable by the Computing Section of the British Astronomical Association.

<sup>1</sup> Merton, G., *Mon. Not. Roy. Astro. Soc.*, **109**, 4 (1949).

<sup>2</sup> Crommelin, A. C. D., *Mem. Roy. Astro. Soc.*, **64**, Pt. 5 (1929).

## ROTHAMSTED EXPERIMENTAL STATION

### REPORT FOR 1948

THE publication of the report for 1948 of the Rothamsted Experimental Station\* includes brief reports from the thirteen Departments, namely, Physics, Chemistry, Pedology, Soil Microbiology, Botany, Crop Physiology, Statistics, Plant Pathology, Biochemistry, Nematology, Entomology, Bees, and Insecticides and Fungicides; these are listed in order to give some indication of the comprehensive nature of the report. An account of the Rothamsted field experiments during 1948 is also given, as well as a report by the Farm Director. A progress report of the Soil Survey of England and Wales, which is now directed from Rothamsted, is also included, and, finally, a review of work on the serological reactions of plant viruses. All the investigations are concerned with soils and crops and with some of the diseases and insect pests which limit growth. Some of the work is directly concerned with problems that are causing concern to growers to-day, for example, eelworm and viruses of potatoes and of sugar beet. Taken as a whole, however, the research work is not necessarily directed to solving problems of immediate interest; but is of the fundamental kind that will enable a rational and more rapid approach to be made to the solution of many of the growers' difficulties in the future. There is a wide choice of important research, and the significance attached to the various lines of work must depend mostly on the reader's particular interest.

In the Physics Department considerable work has been done in the past few years on evaporation, and an interesting application of some of this is noted in a joint experiment on the spray type of irrigation carried out on the farm of a well-known grower in Surrey. A small weather station was set up on the field, and, from records sent weekly to Rothamsted, the transpiration was estimated and the trend of the estimated soil moisture followed during the season. The soil moisture deficit as calculated from meteorological data agreed very well with that obtained from soil samples. A report of these experiments on controlled irrigation is included with the section on field experiments. A large increase in sugar beet resulted

\* Rothamsted Experimental Station, Harpenden. Report for 1948. Pp. 151. (Harpenden: Rothamsted Experimental Station, 1949.) 5s.

from irrigation in the dry summer of 1947; but there was very little difference in yield in the following year, when the summer was wet. Perhaps the most surprising result was that the addition of potassium nitrate to the irrigation water made no difference to the weight of crops.

The work of the Chemistry Department, on sewage sludge and composts, summarizing the results of more than a hundred field experiments, cannot fail to interest a wide circle, especially in view of the controversial subject of 'organics'. It is concluded that the crop-producing power of sludges taken from drying-beds is much less than that of equal weight of farmyard manure. Its physical effects on the soil are less pronounced.

It is interesting to note the widening scope of the Statistical Department, which now includes the organisation, supervision and analysis of agricultural surveys. Three surveys are included, one of fertilizer practice, one of main-crop potatoes and one of methods of milk production. The potato survey includes a test of methods of forecasting the yield, a month or so before lifting, by taking weighed samples of the growing crop. A text-book on "Sampling Methods in Censuses and Surveys" was being prepared for publication.

The new Department of Nematology was set up at Rothamsted during the year. It is concerned with eelworm parasites of plants. There are those that attack stem and shoot, as in the chrysanthemum eelworm, and those that attack the roots, for example, the potato and the sugar-beet eelworm. Work on the latter type has been mainly concerned in bringing to completion the Agricultural Research Council field trials on the nematocidal effects of D-D mixture. At the most responsive of sites, yield, kill and final eelworm-population were all roughly proportional to the rate of application. In some cases, however, an initial reduction in eelworm population was more than made good during the growth of the subsequent crop, when the eelworm multiplied at an accelerated rate.

The long-term rotation and ley-arable experiments will throw light on many aspects of systems of cropping that are practised to-day, and also on new rotations that some progressive farmers may be contemplating. In the Woburn ley-arable experiments begun in 1938, the object is to test the effects on soil fertility of the different systems of cropping. Two similar but more comprehensive experiments have now begun at Rothamsted whereby it will also be possible to compare the two systems—permanent grass plus permanent arable against alternating grass and arable. There will be a direct comparison of the output from permanent grass as compared with temporary grass under the same conditions. There is so much taken for granted in making such comparisons to-day that many will welcome the planning of these experiments at Rothamsted, where the necessary resources exist for obtaining reliable data.

Reference was made above to the possibility that some progressive farmers may be contemplating a change to a new cropping-system. The Rothamsted data on the restricted benefits of inter-row cultivations, the advent of the new weed-killers, and the intensive management of leys will probably lead many to break away from the traditional rotational system that has held sway for two hundred years. Before making the decision, many will appreciate much of the accurate information that will become available from these experiments.