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ROTHAMSTED  
RESEARCH

# Rothamsted Report for 1946

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## Introduction

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W. G. Ogg (1947) *Introduction* ; Rothamsted Report For 1946, pp 16 - 20 - DOI:  
<https://doi.org/10.23637/ERADOC-1-88>

## INTRODUCTION

By THE DIRECTOR

The report follows the "Report for the War Years" and the pre-war abridged reports in omitting the tables giving the detailed results of experiments. It is proposed to issue these separately. Each department gives a brief account of its work and certain departments review in greater detail the progress of some particular line of investigation.

During the year 7 members of the Scientific staff left, 5 of whom were on Agricultural Research Council and other grants. Eleven new appointments were made—5 to the permanent staff and the remainder on grants.

Voluntary workers during the year numbered 39, including 9 short-term workers. Many applicants had to be refused because of lack of accommodation. The countries represented by these workers were Brazil, British West Indies, Ceylon, China, Egypt, France, Holland, India, New Zealand, Portugal, Sweden, United States of America.

With the end of the war several members of the staff had opportunities to attend meetings on the Continent. Mr. Garrett visited Holland in the summer of 1946 at the invitation of the Directie van de Zuiderzee Polders and Miss Glynne in connection with her work on eyespot. Mrs. Watson also visited Holland and Belgium on behalf of the Sugar Beet Research and Education Committee, and Eire at the request of the Irish Sugar Corporation. In addition to these short visits certain of the staff have been away on longer visits. Mr. Pirie, head of the Biochemical Department, is at present in the United States for a year at the Worcester Foundation for Experimental Biology. Dr. Potter, of the Insecticides Department, will shortly be returning from the United States where he was invited to spend a year as visiting professor by the Rhode Island Agricultural Research Station. Dr. C. G. Butler, head of the Bee Department, also spent some time in the United States and Canada in the early part of 1946 in order to visit Bee Research centres. Dr. J. B. Hale, of the Chemistry Department, worked for six months with Professor Lundegardh at Uppsala, and Professor Goldschmidt at Oslo. At the invitation of the Higher Council for Scientific Investigations, Mr. Bawden, head of the Plant Pathology Department, visited Spain, and gave a course of lectures on virus diseases in Madrid. Dr. B. A. Keen, Assistant Director and head of the Physics Department, was in Palestine and West Africa for a considerable part of the year on special missions described in the report of the Physics Department.

Mr. W. Barnicot, the Secretary of the Station, expressed a wish to retire in 1947 and Mr. J. B. Bennett, A.C.A., was appointed to succeed him. It is with very deep regret that we record the death of Mr. Barnicot on 30th December, 1946. We also record with deep regret the deaths of Dr. E. F. Armstrong, F.R.S. (in December, 1945), Hon. Treasurer of the Lawes Agricultural Trust Committee, and of Mrs. Caroline Creyke (in September, 1946) at the age of 101, youngest daughter of Sir John Bennett Lawes.

### VISITORS

During the war years visitors to Rothamsted were practically confined to a relatively small number of specialists consulting particular departments, and members of the Dominion and United States forces on leave. The war ended in time to permit of a considerable increase in 1945, but in 1946, with the further improvement in transport, the number of visitors rose to record heights. In the period covered by this report there were 90 parties of visitors (some of them numbering 100) classified as follows:—

|   |    |
|---|----|
| Empire and Foreign Delegations of Agriculturists... | 8  |
| Learned and Scientific Societies ... ..             | 3  |
| Farmers and Agricultural Students ... ..            | 47 |
| Teachers and Senior Science Classes of Schools ...  | 22 |
| Various Clubs and Associations ... ..               | 10 |

In addition there were some 600 individual visitors of whom the majority were scientific or technical specialists.

Among the foreign visitors to the Station was H.R.H. The Crown Prince Gustaf of Sweden, who spent a full day inspecting the laboratories and field experiments. There were two parties of French Agriculturists during the summer, and two parties of American Agricultural Scientists and State Department Administrators. Many official foreign guests in this country came to Rothamsted as part of their programme arranged by the British Council, among them a party of Sudanese Journalists who were studying British institutions. In all 22 Empire countries were represented, most parts of the United States, and 16 European countries, the only notable exceptions being the ex-enemy states. From further afield there were visitors from Chile, Argentine, Hong Kong, Java, and China. Other parties were the delegates to the Imperial Agricultural Bureaux Review Conference. Several groups of agricultural students from No. 5 Formation College, Luton Hoo, and a number of Polish Officers from the Agricultural Section of the Directorate of Army Education, also visited the Station.

### ACCOMMODATION

Lack of accommodation continued to be a serious problem but some progress was made towards remedying this. Rivers Lodge, south of the main laboratory building, was de-requisitioned by the military authorities and this is being fitted up for the use of the Statistical Department and the Agronomy section. Although the alterations have not been completed the house has been occupied for some time.

Further accommodation has been obtained by the purchase of Rothamsted Lodge, the dower house of the estate, with funds provided by the Ministry of Agriculture. The Entomology and Bee Departments have moved into this house and it is being suitably adapted for their use. These changes have set free the top floor of the Plant Pathology building for the new Pedology Department and the Soil Survey—the headquarters of which was transferred to Rothamsted on 1st October, 1946. Plans have also been submitted to the Ministry for alterations to Red Gables, a house adjoining the laboratories, to provide a proper canteen and more accommodation for scientific meetings.

Rothamsted Manor, which was occupied by the military authorities from the early days of the war, has been de-requisitioned and a scheme is being put forward to the Ministry of Agriculture for its utilisation as a hostel and social centre.

#### THE WORK OF THE STATION

With the end of the war there was a gradual return to peacetime activities. Certain special investigations connected with the war effort were discontinued and some of the long-range work, which had been curtailed or suspended, was resumed.

On the soil fertility side a considerable programme of field experiments was carried out. Sugar beet manuring experiments were continued and also experiments of the manuring of peas. The work recently started on the manuring of forest nurseries gave promising results and will be carried on for several years. Some further progress was made with the fertiliser placement investigations and work on silico phosphate and on organic manures was continued. Dr. Crowther put much time and effort into the tasks of the committee dealing with the revision of the tables dealing with residual values of fertilisers and feeding stuffs.

In the Chemistry, Botany, and Biochemistry Departments the study of trace elements was continued and considerable progress made, especially with manganese. An effort is being made to overtake arrears of laboratory work on the classical fields.

Field observations of a number of soils were made by the Pedology Department on behalf of other departments of Rothamsted and various research stations. In the laboratory some work was done on clay minerals. In the Physics Department the field experiments on deep ploughing were continued and also the work on evaporation and transpiration. The laboratory work included physico-chemical studies on clay.

In the Microbiology Department studies on a variety of soil organisms—bacteria, myxobacteria, actinomycetes, protozoa and mycorrhiza—have been continued and an investigation on resin decomposition in soil carried out on behalf of the Road Research Board. The other main line of work in this department was on nodule organisms including studies on effective and ineffective strains of these organisms.

In the Botanical Department, as already mentioned, work has been done on trace elements, particularly on molybdenum. Toxicity through excess has been studied as well as deficiency. The grassland and weed seed investigations have been continued and work carried out on the effect of temperature and light on growth. The Crop Physiology section was, as usual, concerned with the general field experimental programme of the Station. Work was also done, in conjunction with the Plant Pathology Department, on the physiological effects on sugar beet of infection with yellows and mosaic viruses. The previous work on the physiology of leaf growth was continued.

In the Plant Pathology Department progress was made with the virus investigations in the laboratories, the glasshouses and the field. Some further knowledge was obtained on methods of extracting them from infected leaves and on their appearance and properties. The Biochemical Department took part in this work.

In the glasshouses the effects of light intensity and manuring on susceptibility to infection and virus content of leaf sap were studied. The mycology section worked mainly on Violet root rot, clubroot, take-all and eye-spot.

The Entomology Department continued the study of the effects of weather on insect population and the work on midges, slugs and earthworms was also carried on. Some very interesting information was obtained from the earthworm studies.

The Insecticides Department continued its work on D.D.T., pyrethrum and one or two other insecticides. This included chemical studies and a considerable amount of biological work. Further progress has been made with methods for determining the value of stomach poisons and jointly with the Bee Department an investigation has been made of the effects of the newer insecticides on bees.

In the Bee Department tests were made with sulphonamides for the cure of American Foul Brood and certain other diseases. The pollination work was continued, including the development of a technique to cause honeybees to pollinate the flowers of any particular crop. On the advisory side help was given to beekeepers by the laboratory examination of combs and bees, by lectures and by technical advice.

The Statistical Department carried out research on the problems of experimental design and sampling. As before, assistance was given to the departments of Rothamsted and to various other institutions.

The weather conditions for the greater part of the year were unfavourable for farm work, and during the grain harvest were particularly bad but the experimental work was carried out successfully, in spite of this on both the Rothamsted and Woburn farms.

**PROFESSOR V. M. GOLDSCHMIDT, FOR. MEM. R.S.**

It was our privilege to have with us at Rothamsted for about a year and a half Professor V. M. Goldschmidt, Professor of Mineralogy at the University of Oslo, Director of the Mineralogical Institute in Oslo, and Director of the Government Raw Materials Laboratory.

During that period Professor Goldschmidt, who was the founder of modern geochemistry, gave many scientific talks to the staff and gave invaluable advice on scientific matters in connection with the work of the Station. He was, for instance, responsible for initiating the work on the fundamental properties of water, in which certain members of the Rothamsted staff, together with Dr. K. Lonsdale, F.R.S., formerly of the Royal Institution, and Dr. L. E. Sutton of the Chemistry Department, University of Oxford, are taking part. Professor Goldschmidt returned to Oslo in June, 1946, and we have learned with much regret that he has since died.

**MR. W. BARNICOT, M.B.E.**

The sudden death of William Barnicot on 30th December, 1946, came as a great shock to everyone, and especially to those of us who had been associated with him since his appointment as Secretary on 1st January, 1920. He joined the staff at a critical time when, after the upheaval and disturbance of normal work during the first world war, considerable extension of personnel and

the development of new departments were in progress. From the very first he showed a willing co-operation with the heads of departments, and the inevitable "growing pains" of a rapidly expanding institution were much eased by his helpfulness. As time went on the secretarial and maintenance work became far too much for one man to deal with, but it was with the greatest reluctance that Mr. Barnicot consented to delegate anything to other people. To the very end it was a constant struggle to persuade him to take things more easily and to allow any of his old work to pass out of his hands.

In his own characteristic fashion he was an adept at dealing with the staff and it was an education to be present when he interviewed candidates for appointment, especially to the assistant staff. His courtesy, tact and withal his shrewdness helped him to size up the applicant and determine the question of suitability for the post.

From the very beginning Mr. Barnicot took a keen interest in the social life of the place. He was an active member of the Tennis Club and served both on its committee and on that of the Staff Union when the latter came into being. In his earlier years at Rothamsted he was one of the mainstays of the Laboratory Dramatic Society, which gave inimitable home-made shows in the Sample House. These were always topical, and all the audience could appreciate the personal application and the "taking off" of members of the staff, from the Director downwards, and there was an intimate spirit of friendliness which owed a great deal to his genial personality. In all his doings his wife rendered yeoman service behind the scenes, and her death was a real loss to those members of the staff who had enjoyed the hospitality of their home. After her death Mr. Barnicot became more and more wrapped up in his work, but the marriage of his sons and the arrival of his first grandchild gave him the greatest joy.

Rothamsted has been fortunate in the loyalty and long service of its secretaries, for George Dunkley and William Barnicot between them covered the long span of years from 1878 to 1946, except for a brief interval of about two years. Their long service resulted in a sense of continuity which did much to weld Rothamsted into the real community which it is to-day.

W. E. B.