

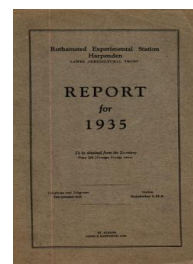
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## Report for 1935

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### Plant Pathology

#### Rothamsted Research

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## PLANT PATHOLOGY

*Virus Disease.* The group of workers who have since 1929 studied virus diseases under Dr. J. Henderson Smith, suffered its first loss in October, 1935, when Dr. John Caldwell left to take up the Lectureship of Botany in University College, Exeter. His last important contribution was to show that inoculation with a strain of virus conferred in certain conditions some degree of immunity against a virulent strain of the same or a closely allied virus. Dr. Sheffield, in studying by micromanipulative technique the localisation of virus in the plant and within the single cell, has found that individual cells differ in susceptibility to virus attack, only 6-12 per cent. of injected cells responding to inoculation.

Mrs. Watson has carried out a series of quantitative investigations on the relations between the insect vector and the infection it produces. The amount of infection increases as the time of feeding the infected insect on the healthy plant is raised from 2 minutes to 12 hours, but only by about 20 per cent. As the time of feeding on the infected plant, before transference to the healthy plant, is increased from 2 or 5 minutes to 1 hour, the amount of infection falls by 50 per cent., but rises again after 1 hour's feeding. The fall may be due to development of an antibody in the insect body and this is being investigated with the help of Miss B. Mitchell. An infected insect, transferred from one healthy plant to a second, may infect the second plant as well as the first, but not if the period on the first plant exceeds one hour. This is of importance in the question whether insect transference with viruses of the type under experiment is purely mechanical or requires ingestion by the feeding insect.

*Mycology.* A new glasshouse for mycological work was completed in October. It includes one large compartment, 24 ft. by 30 ft., for general mycological work, and four small compartments, 11 ft. by 11 ft., which can be made insect-proof when required. Heating is by a thermostatically controlled, oil-fired boiler. The new house has already proved that it is excellently adapted for the work required.

The completion of this house enabled investigations to be commenced towards the end of the year on the club-root disease of crucifers. It is proposed to examine first the well-known action of lime in controlling the disease, and to determine if possible whether this is due to an effect on the disease-producing organism itself, or whether it is due to an increased resistance conferred upon the host plant. An effort will also be made to find an explanation for those cases in which lime is stated to have no beneficial effect.

The work on root-rot diseases of cereals has been continued. F. J. Greaney, on leave from Canada, co-operated with G. Samuel in an investigation on the gradual invasion of wheat root systems by fungi as the crop ripens. They found that the fungus *Fusarium Culmorum*, which is usually regarded as a disease-producing organism was much more widely distributed than was imagined, and that healthy wheat crops by the time they were reaped often had a considerable amount of the fungus present on the roots without suffering any apparent harm. Studies will be made later of the conditions under which this fungus becomes a parasite of importance.