the principal sandfly pest in the South Island have been continued, but so far without success. Preliminary work has been done on two other insect pests that were prominent this season—the spider mite in raspberries, and the wheat bug, which causes both sticky-dough in wheat and failure of young cruciferous crops.

WORK FOR OTHER DEPARTMENTS

Island Territories.—An officer was loaned to the Samoan Administration to investigate and report on the coconut beetle problem in Western Samoa. Following this a survey was made of the insect pests of economic plants in Rarotonga.

Tourist.—An investigation and report was made on the probable effect of certain proposed work in the Waitomo Cave on the glow-worm population.

Agriculture.—All possible assistance has been given to the Department of Agriculture in its proposals to revise the existing quarantine system.

FATS RESEARCH LABORATORY

Director: Dr. F. B. Shorland

During the past year the main attention of the Laboratory has been directed, in collaboration with the Dairy Research Institute, towards the elucidation of the nature of butterfat. Various other fats of direct economic interest have also been studied, and, in particular, increasing emphasis is being placed on meat fats as a part of the New Zealand contribution towards the collaborative British Commonwealth work on meat.

BUTTERFAT INVESTIGATIONS

The comprehensive survey on the seasonal variations in the fatty acid composition of butterfat has been continued and existing knowledge has been further extended. For this work it has been necessary to devise improved techniques, and a paper on this aspect, covering the work over the past three years, has been prepared for publication.

Significant advances have been made in the elucidation of the nature of the highly unsaturated C18 and C20 acids, which are important in connection with the development of rancidity of butterfat. It has been found that the sample of New Zealand butterfat investigated contained about 1 per cent. of octadecatrienoic acid, as compared with less than 0·1 per cent. in the English butterfat studied by other workers. The unsaponifiable matter of butterfat has been further investigated, and a sterol exhibiting the properties of cryptosterol has been isolated.

Owing to the absence of staff overseas, the study of glyceride structure has been temporarily suspended.

TALLOW

Further tests on the high-vacuum short-path distillation of tallow fatty acids for stearine-manufacture have been carried out, and these indicate considerable advantages over the methods at present in use. In due course it is hoped that the method worked out in this Laboratory will be applied to the industry and so increase the yield and improve the quality of the product. Inquiries have been made by freezing-works regarding the methods of grading tallow, which at the present time are not satisfactory, and it is hoped, in association with the Standards Institute, to make a study of this problem and evolve satisfactory methods of grading.