from the Government Statistician. After considerable experimentation it has been found that, using this equipment, computations could be done in one-tenth to one-twentieth the time required for the same work using the latest fully automatic calculating-machines. The Section's gratitude for considerable assistance in this project is due to Messrs. Butchers and Woods, past and present Government Statisticians, to Mr. Woodford, late of the Census Office, and to Mr. Dainty and Mr. Bartlett, of Messrs. Powers-Samas, Ltd.

The research activities of the Section have been largely centred on the punched-card technique mentioned above and theoretical work on experimental designs appropriate to work on identical twins, particular care being given to modifications required in the event of one or two animals being lost to the experiment through disease, &c.

Investigations under way deal with the accuracy of sampling methods used in estimating the production of milk, fat, and solids-not-fat over a complete lactation; of estimating the daily variation of a cow's performance; and the accuracy of dairy experiments. An attempt is also being made to devise a suitable method for calculating the heritability of the shape of the lactation curve.

Advice has been afforded to many branches of the Department and other bodies. Examples are Plant Diseases Division, Grasslands Division, Soil Bureau, Dominion Laboratory, and State Forest Service.

DEFENCE DEVELOPMENT SECTION*

Director: Acting-Professor T. R. Pollard

The major portion of the programme for 1946 was the construction of four radar height-finders for the Meteorological Services of the R.N.Z.A.F. The work done by this Section comprised the whole of the mechanical structures, together with the thyratron-controlled Ward Leonard sets. The mechanical structures are completed and are being erected in the Canterbury University College grounds for testing. The first thyratron-controlled Ward Leonard set is practically complete, and it is expected that final tests will take place shortly and thus allow the first unit to be despatched to its destination, which, tentatively, is Fiji.

Other work undertaken by this department during the year is the construction of a number of stroboscopes for other Government Departments and industry, the overhaul and calibration of shock therapy machines for the mental hospital, the design and development of an electronic wheat-counting machine for the Wheat Research Institute, and the design and development of a high-frequency electronic sewing-machine for the Latex Rubber Co. A prototype model has been supplied to this company and is being used by them for the welding together of thin polyvinyl chloride fabrics. Six electronic moisture-testers were designed and developed in conjunction with the Wheat Research Institute. These were supplied to industry for the checking of moisture content of wheat crops. They have been very successful, and recently repeat orders have been received for a further number. It is likely that their use will extend into fields other than those of wheat. Tests are being made at the present time to see if they are adaptable for linseed. A special ionization chamber was made up for the Dominion X-ray and Radium Laboratory.

A considerable amount of work has been done for the science and engineering departments of Canterbury College. It has been possible to design and manufacture for these departments apparatus which has been required urgently for the abnormally large classes, thus saving a considerable amount of overseas funds.

A certain amount of maintenance and construction work has been carried out for the Canterbury Project.

A great deal more work could have been undertaken, but the very limited staff made this impossible.

In the ionosphere section, routine recordings of ionosphere data have been continued at four stations, and analysis, coding, and despatch to overseas predicting centres has been satisfactorily maintained.

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* See p. 23 *re* future activities of this Section.