Industrial servicing and development work has accounted for the major portion of the year's work, and a brief description of a few of the more important projects should serve to illustrate the wide variety of problems that have been dealt with during the year.

The Physical Section has suffered severely from lack of staff, and it has not yet been possible to secure the services of a competent metallurgist. Assistance in metallurgical problems is being made by regular visits from metallurgists attached to the Dominion Laboratory and the Dominion Physical Laboratory.

Newspaper-wrapping Machine.—Work on this prototype machine continued throughout the year, and two major development difficulties arose.

(*a*) Adhesion of wrappers was too slow to permit ejection of wrapped papers immediately after rolling.

(*b*) The wrapper roll feed mechanism gave unsatisfactory performance in service as it required constant adjustment.

The first difficulty was overcome by adding a pressing stage to the machine, and the second is at present being solved by redesigning the wrapper feed. Trials of the machine at New Plymouth gave a best run of 1,200 wrapped papers in slightly over half an hour.

Brush-making Machine.—This machine, designed to produce plastic-set artists' brushes at a speed of five a minute, was built during the year, and has completed preliminary running tests successfully.

Breathing-apparatus for Respiratory Cases of Poliomyelitis.—A rough prototype of this apparatus was constructed for the Auckland Hospital, with the use of surplus aircraft parts. The apparatus has now been redesigned and remade as a permanent piece of equipment.

Skin-temperature Measuring.—This equipment has been constructed for recording the body temperatures of infants under anæsthesia.

High-speed Counting and Packing Machine.—Designed and made for a manufacturer of crown seals, this machine has two counting heads which alternate in counting and delivering 100 gross of crown seals to cartons.

Acceptance and Performance Tests of Machine Tools and Equipment.—Equipment has been made for the testing of machine tools to Schlesinger limits, and considerable work has already been done both for manufacturers and importers of new and reconditioned machine tools. The testing of industrial products such as fans, pumps, &c., also comes within the scope of this section.

There has been a marked increase during the year in the amount of work involving testing and calibrating to standard specifications, and it is expected that this work will increase still further as a wider range of equipment is secured.

Equipment is at present being completed for the rapid multiple testing of watt-hour meters for the test-room of the Auckland Electric-power Board.

Air-sampling Equipment.—In conjunction with a local consulting analyst, equipment has been manufactured that will sample the air in the vicinity of the industrial area at Westfield. Wind direction and time will be recorded coincidently with the analysis of the air.

Soil Shear Test Machine.—An improved model of the original machine has been constructed and tested, and in this model individual loading pumps are employed on the axial and shear loads.