

facilities to help in the production of gauges and tools throughout New Zealand. As a result of this liaison certain members of the technical staff have received training along special lines in Australia this year, covering subjects such as gauge design, metrology, and metallurgy. The opportunity is taken here of expressing appreciation of the kind co-operation given by the Australian Government. In co-operation with the Munitions Controller, a metrology laboratory equipped with measuring appliances has been established, and steps are also being taken to set up a sub-standards metrology laboratory for reference purposes, and arrangements have been made with the Australian Commonwealth Council of Scientific and Industrial Research to have this sub-standard equipment periodically checked by the National Standards Laboratory, Sydney. The workshop consists of a tool-room and an instrument section. The tool-room is fully engaged on munitions-production. The instrument workshop is engaged on instrument manufacture and repair for the armed Services, the munitions industry, and in servicing New Zealand laboratories occupied on essential work. A glass-working section has been incorporated with the instrument workshop, and this has proved a most valuable asset.

Accommodation has proved a problem this year in view of the rapid expansion. Work is being carried on under very difficult conditions in unsuitable premises. The realization of this has emerged, and new buildings at Lower Hutt are in course of erection to accommodate a laboratory for general physical work as well as laboratories for optical, electrical, metallurgical, and mechanical testing work; also a modern tool-room, instrument workshop, heat-treatment room, and glass-blowing section, which form part of the general set-up.

(2) BRIEF REVIEW OF TESTING AND INVESTIGATIONAL WORK FOR 1941-42.

Tests on the following materials have been made: Cloth, felt, refrigerator insulating-materials, "Pinex" wallboard, engine pistons and piston-rings, luminous paint, canvas for life-jackets, tarpaulin, cardboard, electric lamps, catgut, plywood, bricks, plaster-board, asbestos roofing, bearing metals, electric cells, magneto insulation materials, Sisalkraft paper, tracing-paper, fluorescent neon tubing fire-hose nozzles.

Tests on the following instruments and equipment have been made: Pyrometers, thermometers, lenses, barographs, aneroids, binoculars, telescopes, theodolites, chronometers, electric instruments, cameras, sextants, photometers, water-flow meters, micrometers, surface plates, dial gauges, and production gauges of all types, including screw gauges.

(3) DESIGN AND CONSTRUCTION OF INSTRUMENTS AND EQUIPMENT.

Instruments designed and constructed in the laboratory include spirit-levels, dial gauges, 0.001 in. comparator, toolmakers' microscope, pyrometer control, water-flow meter for land drainage, photometer for black-out tests, rock-grinding machine, screw gauge optical projector, stereoscopic telescope fitting, pyrometer-testing furnaces, voltage regulator, vacuum-pumps, aerial-mapping equipment, grass-juice extractor, micrometer-testing equipment, pressure testor for hand-grenade centre-pieces, psychrometers for cool stores, thermostats, screw-diameter-measuring machine, meteorological-balloon fillers and rollers, glass fractionating columns, thermometers, sugar-beet-testing equipment, ground glass joints, automatic pipettes, toolmakers' steel parallels, thermo regulators, and charcoal-testing machine.

In addition to the above, fully 50 per cent. of the instrument workshop's activities have been directed to the repair of a wide variety of scientific instruments and equipment.

DOMINION LABORATORY.

Director: R. L. ANDREW.

The Dominion Laboratory is a service laboratory for Government Departments.

There was a further increase in the number of samples examined and reports made in connection with war conditions, and it has therefore been necessary to curtail some of the normal activities of the Laboratory.

WORK FOR VARIOUS GOVERNMENT DEPARTMENTS.

The number of samples received from the various Government Department's were: Wellington (Main Laboratory), 11,049; Auckland, 6,299; Christchurch, 5,567; Dunedin, 1,856: total, 24,771.

Customs.—Fewer samples were received than in previous years.

Police.—Numerous samples, very varied in nature, were examined. Poisons were found in a number of exhibits submitted in connection with suicides and accidental deaths. Drugs suspected of being used for procuring abortion were examined, and also samples of alcoholic liquors. The year was notable for the number of glass fragments examined in connection with fatal motor accidents and cases of breaking and entering. In a number of instances these examinations provided conclusive evidence.

Samples of blood and urine were examined for alcohol in order to establish whether or not deceased persons were drunk at time of death. The Hilger quartz spectrograph was again found extremely useful, and particularly so in one case where paint marks and pieces of steel were examined in connection with a fatal motor accident. Information was obtained which would have been impossible by other means.

It is very satisfactory that the Police Department makes full use of the wide range of scientific aid available from the Laboratory.

Department of Health.—A very large number of milk samples, 15,396 in all, were examined in the main Laboratory and the three branches. Special attention has been given to milk supplied to schools and to military camps. With very few exceptions the milk supplied throughout the Dominion is of good quality.

Water.—Numerous samples from existing and projected water-supplies were examined. A number of these were from supplies to military camps.

Sewage.—An increased number of sewage samples were examined, most of them in connection with the disposal of sewage at military camps.