

## DOMINION LABORATORY.

The work during the year has consisted principally of chemical analyses and investigations carried out on behalf of Government Departments. The numbers of samples received in Wellington from various Departments and Branches are as follows: Customs, 378; Police, 42; Geological Survey, 89; Main Highways Board, 334; Marine, 26; Mines, 464; Health, 3,591; Post and Telegraph, 30; Public Works, 283; Railways, 69; Stores Control, 36; Agriculture, 57; other Departments, 171. In addition, 29 were received from municipal and other public bodies, and 232 from miscellaneous sources. The total for the year was 5,832. The totals for the branch laboratories are: Auckland, 2,280; Christchurch, 2,278; Dunedin, 1,714. Of these, the greater proportion consists of milks and other foodstuffs examined for the Health Department. Quite a number in each centre were submitted by the Police Department.

## COMMENT ON THE WORK.

*Defence Department.*—As rifle-cartridges of New Zealand manufacture were developing slight cracks in the brass when kept for a long period, regular analyses of all brass used and of the nickel caps have been undertaken. The specifications for these materials is necessarily rigid.

*Mines Department.*—There has been renewed interest in gold-mining during the year, and the number of prospectors' samples for assay has increased considerably. Some attention has also been given to ores of antimony, chromium, and manganese.

*Police Department.*—Examinations of liquor and analyses in cases of suspected poisoning constitute the greater part of the work for the Police Department. In Wellington the following poisons were found in various cases: Aconite, cyanide, morphine, phenol (carbolic acid). There were two cases involving counterfeit coining. Two investigations were associated with murder charges. In Christchurch poisonous substances detected in connection with police investigations were prussic acid, arsenic, ergot, strychnine, tetrachlorethane, and methylated spirits. In Dunedin the samples examined consisted of beer, wine, medicine, partially burned articles from a fire, safe-linings in breaking and entering cases, and exhibits in poisoning cases. Methyl alcohol was detected in a case of supposed poisoning by methylated spirit. Strychnine was detected in another case of death from poisoning.

*Public Works Department.*—Numerous samples were submitted in connection with hydro-electric works. Mastic and bitumen for use at Arapuni were carefully examined. Galvanized hardware of numerous types was tested for efficiency of galvanizing. Used and reconditioned oils from several stations were examined for suitability for further use. Absorption tests were made of switchboard material and various types of porcelain fittings used in domestic installations of electric current. Sand for concreting was examined for salt content. A special investigation was made regarding the cause and extent of corrosion of a large coil of aluminium cable.

*Post and Telegraph Department.*—This Department required tests of sulphuric acid used in storage-batteries, of floor-polishing oils, of used lubricating-oils, fire-extinguishing liquids, and other miscellaneous supplies.

## GAS INSPECTION.

Gas-supplies in the four main centres and in most of the other principal towns of the Dominion were regularly examined for heating-value, purity, and pressure.

## RESEARCH.

*Incidence of Goitre.*—This research, undertaken in conjunction with the Health Department, was continued during the year. Special determinations were made of the iodine content of milk, eggs, vegetables, and urine from the Thames district, a somewhat anomalous area, where, although the iodine content of the soil is low, the incidence of goitre is also low.

*Coal.*—In addition to the work carried out under the Coal Research Association, the use of Reefton slack coal for blending with other coals for gasmaking was investigated. The results were circulated to gas companies by the Under-Secretary for Mines.

*Bananas from Cook Islands.*—The conditions under which bananas could be attractively ripened for the market were ascertained by numerous experiments in a small cabinet. A small room was fitted up later in which humidity, temperature, and ventilation were under control, and in this room two lots, each of twenty-eight cases, were successfully ripened. A full report will be issued shortly.

*Kauri-gum.*—A special investigation on the purification of kauri-gum chips by means of solvents has given very promising results, which have been confirmed in a small-scale intermediate plant. The process will be tried out on a commercial scale, and, if successful, should materially assist in reviving the kauri-gum industry.

*Spray Research.*—Careful analyses of various lime-sulphur sprays have proved of great assistance to the staff of the Plant Research Station engaged in the study of orchard diseases and their control. Similar work on other types of sprays is in progress.

*Meat Offal.*—Some work is being done on varying methods of treatment and packing of meat offal, such as livers, kidneys, &c., for export to Great Britain. There seems little doubt that the prices obtained for these goods would be enhanced if improved methods of packing were adopted.

The Director of the Laboratory has supervised the work of the Coal Research Association, and kept in touch with the Chemist of the Association for Leather Research. He was also associated with the late Mr. J. A. C. Bayne, Inspecting Engineer, Mines Department, and Mr. F. W. J. Belton, Engineer to the Christchurch Gas Co., in the preparation of a special report on the utilization of New Zealand coals.

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