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, and found satisfactory.

Research.

Incidence of Goitre.—This research, undertaken in conjunction with the Department of Health, was completed during the year. The medical part of the work is almost completed, and the whole will be published at an early date.

Sulphuretted Hydrogen in Mines.—Sulphuretted hydrogen, an offensive and highly poisonous gas, is occasionally present in mines, and, at the request of the Under-Secretary for Mines, an investigation was undertaken of methods for its detection underground. A convenient form of detector has been designed and is being tried out in the Laboratory. A full report will be published later.

Gasmaking.—Various samples of Liverpool and other coals were specially examined as to their suitability for gasmaking, both singly and in blends.

Bananas.—A report on suitable conditions for the ripening of bananas has been published in the *New Zealand Journal of Science and Technology*. Further investigations on special phases of transport and storage problem are being carried out.

Kauri-gum.—Research on the extraction of a pure kauri copal from impure swamp gum by means of solvents has been continued with considerable success. The solvent recommended is a mixture of ethyl alcohol and benzol. In evaporating the solution the temperature is kept below 100° C. The last traces of solvent are driven off by live steam, and the product is dried in a current of warm air. The recovered kauri copal is a fine light-coloured powder of uniform composition, readily soluble in many organic liquids, and with possibilities for use in lacquers. It can also be readily "run" for varnish-making. After several trials in a small-scale intermediate plant at the Laboratory a solvent plant lying idle in Auckland was reconditioned, and the process tried out on a commercial scale. Samples of purified copal from this plant have been sent to several manufacturers abroad. The success of the process now depends on the demand for the product from abroad and on the price it is able to command.

Soil Survey.—A number of intricate analyses have been made to provide necessary data for deciding the origin and relation of certain soils in the North Island which are being investigated by the Geological Survey.

Spray Research.—Commercial lead and calcium arsenate sprays, of which practical trials had been made at the Plant Research Station, were analysed for chemical composition and particle size. This latter was determined by first washing through a 200-mesh Tyler sieve, particles greater than 74 microns in diameter being retained on the sieve. The material passing through was stirred to a uniform suspension with water, and the weight noted of material deposited in successive equal units of time on a special pan balanced in the liquid. By application of Stoke's law, aided by graphical methods, the sizes of the particles deposited could be determined and the percentage of each size. (Full details of the method, an adaptation of that of Calbeck and Harner, will be published shortly in the *New Zealand Journal of Science and Technology*.) While chemical analysis showed almost uniform agreement in composition, particle size determination disclosed wide differences. These differences could be correlated with the practical tests, the finer material giving in every case the better results.

Bacon.—Some investigation was made of the relation between feeding-methods and fat-deterioration during freezing and subsequent curing.

Meat Offal.—A small amount of work was done on methods of preparing and packing of meat offal such as livers, kidneys, &c., for export. The value of moisture-proof cellophane for wrapping purposes was demonstrated.

The Director of the Laboratory is a member of the Committee of the Leather Research Association, and also of the Committee of the recently-formed Standards Institute. Both he and other members of the staff have been frequently consulted regarding chemical subjects or processes of which they have special knowledge.