

METALS AND CORROSION

Many examinations were made of metals by analytical and metallographic techniques. These were also applied to a variety of corrosion problems. Problems investigated included the galvanizing of steel spring washers, the corrosion of a cast-steel galvanizing-bath, the tinning of copper terminal lugs, the fracture of a coupling bolt in a hydro-electric generator, the season cracking of brass spray-pump containers, and the corrosion of water-spray guns. A large proportion of this work was undertaken directly for manufacturing industries.

COAL

More than 1,200 samples were received for analysis. These were mainly : 840 drill, 95 mine, and 72 outcrop samples of coal ; 143 mine dusts ; and a few samples of mine air and other gases. The survey work was continued in collaboration with the Geological Survey. For the Iron and Steel Department experimental cokes were made from blends of high-sulphur bituminous coals with non-coking low-sulphur Waikato coal. A classification scheme for coals based on calorific value, ash, and sulphur was determined. Considerable work was done on the washing of coal and on the inflammability of mine dusts.

Information derived from the work of the section is contained in twenty-six Coal Survey reports compiled during the year.

CHEMICAL ENGINEERING

The advisory work on fuel efficiency in industrial and local-body steam plants was continued. The installation, testing, and trial running of the experimental plant for the production of antibiotics at the Plant Chemistry Laboratory was completed. Further work was done on the curing of tobacco leaf. An investigation of the drying of hops was commenced. Other matters investigated included the packing of dehydrated apples, the bottling of apple-juice, and constant-temperature cabinets for insect research.

BUILDING AND CIVIL ENGINEERING MATERIALS

See under "Reports of Research Committees of the Council of Scientific and Industrial Research—Building Research."

GENERAL INVESTIGATIONS

Many analyses were made of insecticides. This involved a great deal of investigational work on methods of analysis of the new organic poisons and on the determination of traces of mercury. Grapes and tomatoes examined for residues of D.D.T. left after spraying in no case showed more than 7 p.p.m., which is the limit permitted by the Food and Drug Regulations. Apples sprayed experimentally with a selenium preparation to control red mite were found to retain not more than 0.5 p.p.m. of selenium. Analyses were made of timber impregnated at the Plant Diseases Division with boric acid, zinc chloride, arsenate, chromate, and fluoride respectively. Commercial timber, preserved with wolman salts, was examined by analysis. Some analytical work on moth-proofing of fabrics was also done.

Work was commenced on the optical properties of crystals.

SERVICE TO INDUSTRY

Much assistance was given to manufacturing industries, particularly in metallurgy, corrosion problems, food investigations, mineral resources, building-materials, and chemical engineering.