

CHEMICAL ENGINEERING

In collaboration with the Plant Chemistry Laboratory and the Plant Diseases Division, equipment on a pilot-plant scale for the production of penicillin and other antibiotic substances was designed for installation at the Plant Chemistry Laboratory.

With the staff of the Leather Research Association, a small batch-type dryer was designed for leather articles used in the manufacture of boots and shoes.

Technical advice was given to the Internal Marketing Division on dehydration problems, and further technical supervision was provided at the Motueka apple-dehydration factory. The sliced-apple sulphiting equipment was installed early in the 1946 season, and the principal task for the year was completing the reorganization of the apple-processing line prior to drying.

The survey of conditions in tobacco-kilns at the Tobacco Research Station commenced in 1945 was continued during 1946 with a careful survey of airflow, temperature, and humidity in a modified kiln. A design was completed for a cabinet in which a small sample of tobacco-leaf could be cured under carefully controlled conditions of temperature, humidity, and air flow.

For the measurement of low rates of air flow in the tobacco research work, a heated-sphere anemometer designed by the University of Illinois was constructed and calibrated in a wind-tunnel built at the Laboratory and proved very satisfactory for the measurement of air flows of the order of 6 ft. per minute. Similar anemometers made by the Dominion Physical Laboratory were also calibrated.

Plans of a revised design of commercial-size seed-dryer were made available to five firms in Otago and Southland. Technical assistance was given to the firm which had a seed-dryer in operation.

In collaboration with the Fruit Research Officer, experimental work on the recovery of apple-juice from waste material produced at the apple-dehydration factory at Motueka was commenced.

An experimental tray dryer designed in the Laboratory for use in investigational work on the drying of various products was installed. Tests were carried out in collaboration with the Fruit Research Section, Department of Scientific and Industrial Research, for the Government of Fiji to find the optimum conditions for drying bananas.

To provide for industry a service covering all aspects of steam-generating, a Fuel Efficiency Service similar to those initiated by the British Ministry of Fuel and Power in Great Britain and by the Commonwealth Coal Commissioner in Australia was inaugurated. Boiler trials on 16 plants were conducted during the year, including a number in the Wellington District, and some 30 plants, including potteries and brickworks, were investigated in the Otago-Southland district. Considerable savings of fuel are anticipated as a result of recommendations made in each of these reports, and it is considered that by the full adoption of methods such as are being recommended a 20 per cent. saving of coal used for industrial purposes in New Zealand, amounting to 100,000 tons per annum, could be made.

GENERAL INVESTIGATIONS

This section of the report includes work done in various sections of the Wellington Laboratory and some of the work done in the branch laboratories.

Additional work for the Police Department included the following: samples of opium; earth, clothing, shoes, &c., in a murder case; wash from illegal stills; paint from a motor accident; fragment of mirror on accused person; obliterated numbers on bicycles; analyses of "tonic wine"; instruments, pills, &c., in alleged abortion cases.

Work on timber-preservation was continued, and involved the analysis of a large number of solutions and treated wood samples.