

*Bulletins.*—Bulletins issued during the year comprise—

- “Report on the Fischer Process,” by Dr. H. O. Askew.
- “Summary of Investigations on New Zealand Coal,” prepared by W. Donovan.
- “Low-temperature Carbonization of blended New Zealand Coals,” by W. G. Hughson.

A bulletin dealing with Waikato coals is in course of publication, and bulletins on southern brown coals and on Westport coals are in preparation.

*Reports.*—Reports on coal-dust in various mines, prepared by S. W. McIntosh, have been forwarded to the mines concerned.

Progress reports of the work have been furnished to the Advisory Committee from time to time.

The following abstracts and descriptions of processes have been prepared either for circulation to members of the Fuel Committee or for publication in the *Journal of Science and Technology* :—

- (1) Developments in the Braunkohle Industry in Germany.
- (2) Reactivity of Cokes (Technical Paper 18, Fuel Research Board).
- (3) Fifth Annual Report, Safety in Mines Research Board.
- (4) Inflammation of Coal-dusts. (Maron and Wheeler.)
- (5) The Hird Process.
- (6) New British Short-flame Burner for Pulverized Fuel.
- (7) Report on Pulverized Fuel.
- (8) Absorption of Oxygen by Pre-heated Coal.
- (9) Plassmann Process.
- (10) K.S.G. Process.
- (11) Report on Utilization of Slack from the Ohai Coalfields.

*Investigation Abroad.*—During the year Mr. W. Donovan, Assistant Dominion Analyst, visited Canada on behalf of the Waikato Coal-mine Owners' Association to inspect and report on the operation of the Lurgi process at Bienfait, Saskatchewan. Opportunity was taken to inspect also the K.S.G. plant recently erected at New Brunswick, New Jersey.

#### FRUIT RESEARCH.

A grant of £150 made to the New Zealand Institute of Horticulture for bud and stock selection in connection with citrus fruits has been used for the introduction and establishment in a nursery in the neighbourhood of Auckland City of a number of standardized Californian and Australian lemon and orange trees. On this area one thousand citrus stocks will be available for working with the varieties introduced. This stock consists of sweet orange, citronelle, trifoliata, and Florida sour-orange varieties. The growth and development of the buds and trees in this nursery will be carefully watched, as it is realized that the future success of the New Zealand citrus industry is largely dependent upon the adoption of the best type of lemon and orange trees suitable for local conditions.

At the same time a survey of the citrus areas of the North Island has been in progress, and a large amount of detailed information gathered regarding the growth, development, and fruiting-qualities of the oranges and lemons already established in various districts.

#### COLD-STORAGE RESEARCH.

During the year the Department has co-operated with the Department of Agriculture, Cawthron Institute, and the Cambridge Low-temperature Research Station in a series of investigations connected with the preservation of fruit in cold storage during transport to Great Britain, and in regard to the keeping-qualities of fruit held in local land stores. The experiments were designed upon lines suggested by Dr. Franklin Kidd subsequent to his examination of the previous season's shipments of apples and pears from New Zealand. Six of the main export varieties of apples and pears were subjected to investigation. Experimental consignments were sent forward, accompanied by recording thermometers, in twelve vessels during the fruit-export season. The fruit so despatched had been collected throughout the orchard areas in accordance with a carefully designed plan, and with each shipment a detailed history-chart giving the fullest particulars of the condition in which it was grown, packed, stored, &c., accompanied the fruit. On arrival in Great Britain, the fruit consignments were immediately examined by officers of the Cambridge Low-temperature Research Station, who in due course will furnish a report upon their condition. The information gleaned from last year's experiments indicates the necessity of reducing temperature of fruit consignments to the degree appropriate for cooling, either before shipment or as soon as possible after the departure of the vessel.

The major portion of the wastage last year, being occasioned by fungal rots, indicates the need for further care in handling, orchard treatment, and storage. It is gratifying to record that these experiments have been greatly facilitated by the sympathetic attitude adopted by the various shipping companies. Steps already are being taken by these companies to effect improvements in their vessels, which improvements will permit of better conditions being maintained for fruit during the voyage to Great Britain.

At the Cawthron Institute experiments have been conducted in connection with the holding of fruit in land stores, where study has been made of the influence of temperature and humidity upon the main export varieties of fruit gathered from specified areas.

From the work in this connection already carried out it is apparent that the keeping of fruit in good condition is materially affected by the conditions under which it is grown. The beneficial effects of certain fertilizers in this connection have now been almost conclusively proved. The importance of this research from the point of view of the marketing of our fruit overseas will be obvious.

While cold-storage investigations during the year have been limited to fruit, arrangements now are in hand to extend these to both dairy-produce and meat during the coming season. In the first year the work on dairy-produce will be confined to cheese, and the actual experiments will be conducted in association with the Dairy Research Institute.