

III. Absorption Investigations

An experimental pressure plant has been set up and is operating successfully. By its aid a method has been developed for evaluating absorption and distribution of preservative solutions in various timbers and woods of various densities and moisture content secured by use of several pressure systems. Pressure systems are being compared by the ratio of measured absorption to calculated absorption based on void volume. Those which give maximum penetration, good distribution, and low net retention of preservatives are being selected as most suitable for treating timber. Associated with this work is an investigation into absorption of ions on to wood, being carried out in collaboration with the Dominion Laboratory.

DOMINION LABORATORY

During the year the Laboratory has carried out chemical analyses and investigations required by the Committee. A Chemist has been appointed at the Government Laboratories, Auckland, to undertake the chemical work in connection with the investigations being carried out at the Plant Diseases Division.

Work has also been continued on the testing of paint materials, and a start has been made on the erection of test fences throughout the Dominion (see Dominion Laboratory Report, p. 77).

DOMINION PHYSICAL LABORATORY

Heat Insulation of Houses.—The thermal transmittance values of walls, ceilings, and floors of several State houses have been measured by a modified "guarded hot-box" method, and comparisons have been made between different types of constructions—e.g., brick versus asbestos, cement sheet versus timber weatherboard, and ventilated versus nonventilated wall cavities and floor spaces. A report has been published giving some interesting data. Further work is at present being undertaken on a recently completed house with walls built of no-fines concrete.

Mould in Houses.—This project is nearing completion. Following a series of measurements of atmospheric conditions—temperatures and relative humidities—inside and outside of the houses and in the wall cavities, work has been completed on the calibration of the thermocouples and recorders used. A report is being drawn up on the measurements made.

Relating to this project, a technique has been developed for measuring the rate of ventilation of rooms, and a series of measurements is being made in several of the houses used in the above investigation.

AUCKLAND UNIVERSITY COLLEGE: BUILDING RESEARCH PANEL

Light-weight Concrete Investigation.—The scope of this investigation so far has been limited primarily to studying the properties of concrete in which pumice has been used as the lightweight aggregate.

Pumice Concrete.—A number of experimental mixes have been prepared under laboratory conditions and a close study made of their physical properties—viz., moisture movement, drying shrinkage, moisture-absorption, permeability, density, crushing-strength, resistance to weathering, modulus of elasticity, &c. For the present, the investigation has been confined to studying the characteristics of concrete made with pumice from the Rotorua district, where extensive deposits of suitable pumice are known to exist.

As the chief drawback to a more general use of pumice concrete lies in its excessively large moisture movement, more emphasis has been placed on determining ways and means of overcoming this characteristic detrimental property. So far the tests have shown that it is possible to reduce the moisture movement to a certain extent by grading of the pumice aggregate, but not sufficiently to make it comply with the British Standard Specification for precast concrete blocks for walls. It is anticipated that with the provision of a temperature and humidity controlled mixing and curing room it will be possible to make recommendations as to the exact possibilities and limitations of pumice concrete as a permanent building material.