to distempering or papering, the casein used as a distemper binding, and flour paste employed to attach wallpapers. Numerous chemicals known to possess fungicidal value were tested with a view to providing an adequate control. Of these the most effectual proved to be sodium pentachlorphenate, which when added to glue size or casein distemper at a concentration of 2 per cent. gave complete control without adversely affecting wallpapers or distemper. Almost as effectual was sodium salicilanylide when used as a 2 per cent. concentration in water and added to the size or distemper.

State Advances Corporation

The work carried out by the State Advances Corporation with regard to the mould problem consists of the accumulation of field information regarding the distribution of moulds and the application of control measures.

Distribution.—The moulds (*Cladosporium* and *Penicillium*) which are at present causing damage to ceilings and linings in houses administered by the Corporation are widely distributed throughout New Zealand. Quantitative data have been obtained which show that the mould damage extends from north of Auckland to south of Invercargill and from east to west of both Islands. There is a tendency for all houses in a group or in a street to be affected, but again one house may be affected while adjacent houses are free, and cases are even known where alternate houses only in a street are affected. Mould infestations have been known to commence in rooms on the south-east side of a house (rooms in this position being generally bedrooms), although it must also be stated that cases where the first appearance of mould has been noticed in rooms in other parts of the house are not infrequent. One of the puzzling features is that rooms which have fireplaces and are therefore better ventilated than others may in some cases be the first to show mould infestation. Commencing in one room, the infestation may spread from room to room until most of the rooms in a house are affected. There is a tendency for infestations to show up first along the stopped joints of the plaster sheets near the cornices, but not necessarily in any particular corner of the house. Ceilings show a marked tendency for infestations to develop over the surface, except those portions immediately under the ceiling joists, and thus a temporary patterning effect is obtained. This, however, is lost as soon as the infestation becomes general.

An investigation of the influence of various types of wall and ceiling finishes showed that distempered ceilings are most frequently infested. It is upon these that *Cladosporium* usually occurs. Papered walls, on the other hand, are nearly always infested by *Penicillium*. The reason why ceilings are so often affected by *Cladosporium* and wall by *Penicillium* is not known. The most severe infestations are found on the ceilings.

Control Measures.—The control measures at present taken consist of the addition of 2 per cent. of sodium-pentachlorphenate to distemper and paste or the use of this chemical in a 2 per cent. solution as a wash. Special care has to be exercised, as this chemical is difficult to handle in powder form. In the near future it should be obtainable in briquette form, when handling will be easier, although the difficulty of dissolving the chemical will be made greater. It is too early at present to judge the effectiveness or otherwise of the measures at present being taken. The Corporation, however, has regarded the use of sodium-pentachlorphenate merely as a palliative, and has encouraged, and will continue to encourage, work designed to improve the physical properties of the various linings at present being used.

Dominion Physical Laboratory

The Laboratory is investigating the physical conditions incident to mould growth in State houses. During the past winter continuous observations have been made in several State houses of temperature, relative humidity, and air movement. In each house two rooms were selected, one showing definite mould growth, and the other free from it. These measurements were made inside the rooms, in the space between the wall linings and outer walls, and outside. The collateral laboratory work necessary for the interpretation of the results is now nearing completion, and it is then anticipated that the physical conditions determining the incidence of mould will become clear and that methods of altering these conditions to eliminate the trouble can be suggested.

PREFABRICATED CONCRETE AND LIGHTWEIGHT CONCRETE

Auckland University College—Building Research Panel

Cast-in-place Concrete Floor on Precast Joists.—The object of this investigation was to get a comparison with the results of previous experiments on precast joist and slab floor construction (see annual report for 1944) and determine the factor of safety and load factor for the system when subjected to the New Zealand code domestic load of 40 lb. per square foot of floor area.

The range of the investigation was limited, comprising the testing of the materials used, applying a series of repeated loads consisting of one and a half times the design load, and finally applying the maximum load possible with the loading-apparatus used.

Conclusions from the test were as follows:—

(*a*) The beam units will stand all handling and assembly stresses:

(*b*) T-beam action is fully developed:

(*c*) The assembled floor showed a factor of safety of 5·3 for the New Zealand Code domestic loading, the steel being stressed to 81,200 lb. per square inch, which is considerably higher than the usual mild steel of 65,000 lb. to 67,000 lb. per square inch, which would reduce the above factor of safety to 4·3. The test showed a load factor of 9·1, but this again would be reduced to 7·4 if ordinary mild steel were used. (Note.—The steel supplied to-day contains considerably more carbon than the usual mild steel, hence the higher tensile stress.)

Light-weight Concrete.—The main objects of this project are to investigate pumice-supplies and uses of pumice concrete, and to obtain data on the properties of pumice concrete.

The scope of the testing-work so far carried out has included tests on crushing strengths, moisture movements, and densities of different concretes made with pumice aggregates. These include tests on specimens made from controlled mixes and also samples of commercial products.