

85. *Wood Technology*.—In the study on New Zealand beech species, simple chemical tests for distinguishing durable species have been considerably extended. Ferric-chloride - potassium-dichromate solutions have been of some merit, but at present appear to be suitable as laboratory tests rather than field tests. Of all chemical tests so far investigated, the ferric-chloride - sodium-acetate gives the most positive result. Chemical work on the beeches has also been extended to identification of individual species, and of the tests so far examined the methanol-hydrochloric test and those on alcohol-solution extracts indicate possibilities. All this work, together with the investigations on the substantial variation of specific gravity, as well as anatomical features, has resulted in a considerable extension of the collecting of beech material from localities not covered by previous studies.

Routine microscopic identifications of 77 specimens were made during the year, and a microscopic study was made of the refractory nature of miro under pressure preservative treatment. Twenty-five proven samples were supplied for microscopic sectioning, and some 300 permanent microscopic slides were added to the reference collection, which now contains close on 5,000 slides.

Specific-gravity and shrinkage tests were carried out on several trees of different exotic species from the arboretum at Whakarewarewa. When compared with similar tests on timber from trees grown in adjacent areas under forest conditions, it was found that the specific gravity mean for arboretum and forest material is almost the same in two species, but in arboretum material the range for specific gravity shows greater extremes. In general, the higher specific gravities occur at the base with maxima in the central core, and the lower specific gravities near the top of the trees with minima at the central core. The occurrence of a specific-gravity mean and specific-gravity pattern which are similar in trees of approximately the same age grown under considerably different conditions of environment but similar climatic conditions further indicates that, in the species investigated, specific gravity is a function of age, rather than of rate of growth.

Specific-gravity figures (weight oven-dry, volume green) for the arboretum material are compared with those for the forest-grown material (in parentheses), as follows:—

|                                                      |    |    |             |
|------------------------------------------------------|----|----|-------------|
| Douglas fir : Mean values for trees tested           | .. | .. | 0·44 (0·45) |
| Loblolly pine : Mean values for trees tested         | .. | .. | 0·34 (0·33) |
| Spreading-leaved pine : Mean values for trees tested | .. | .. | 0·36 (0·35) |
| Japanese cedar : Mean values for trees tested        | .. | .. | 0·30 (—)    |

The Douglas-fir figures are comparable, the trees being forty years old in each case, and loblolly-pine figures are also comparable, the ages being thirty years. The spreading-leaved pine tests are not directly comparable, owing to fewer tests in forest material and a difference in age of seven years.

For resin-content testing in connection with the pulping of insignis pine from Kaingaroa Forest (paragraph 90), 250 samples have been prepared since September for analysis by the Dominion Laboratory. For each sample prepared, a duplicate was cut and tested for density and shrinkage. The range of test samples covers material from dominant, co-dominant, and suppressed trees. The available specific-gravity results for this material, twenty-two to twenty-three years old, give a basic specific gravity mean of 0·351.

Following this work there has been a reinvestigation of the moisture content of insignis pine by zones from the pith to the bark. This has confirmed the results of a small study undertaken several years ago—namely, that the heartwood possesses a moisture content of 40 per cent. to 50 per cent., which extends usually one to two rings outside the visual heartwood boundary into a dry zone, and then rises sharply to a maximum moisture