

In the North Island, red pine was extensively used in the Waikato district, soon after the war of 1865-66, in the construction of bridges; but in all cases where it was employed, the bridges have had to be partially or entirely rebuilt at considerable expense. Many of the principal timbers were entirely decayed, and in nearly every case the joints were in the same state.

At Invercargill, hewn stringers, 16 inches square, were used in the construction of a railway bridge, erected about twelve years ago. Although used in this instance under most favourable circumstances, without road planking or cross-beams, it has been found necessary to replace a portion of the beams, owing to their decayed condition, and I was informed the others would be removed in a short time. In this case the decay appears to have chiefly arisen from the concavities of the upper hewn surface allowing the retention of rain.

At the Bluff Harbour, a double row of round piles, erected to protect the railway embankment, is connected by red pine scantlings, which are let into the piles and secured by spikes. In nearly every instance the scantlings are completely rotten where in contact with the piles, although often sound in the middle.

It has been much used for bridges in the South Island, but with general results similar to those observed in the Waikato.

It has been used for sleepers on the Invercargill lines, and is said to last in good condition for six years, which is probably its limit of durability for this purpose, as a large number that had been laid seven years were found greatly decayed on being taken up.

In the South Island it has been used for house-building purposes, for which it seems better adapted than for constructive works, as the joints are more or less protected from the influence of wet. In one or two small houses in Dunedin, rimu weather-boarding twenty years old was in fair condition, but by no means equal to kauri, totara, and black pine of similar age.

Although it cannot be considered a suitable timber for outside work, its great strength, and the facility with which straight logs of large dimensions can be obtained, enable it to be used with advantage for heavy beams, girders, &c., under cover.

It is largely used in the manufacture of furniture.

21. KAHIKATEA—WHITE PINE.—(*Podocarpus dacrydioides*.)

A fine tree, 50 to 100 feet high, and upwards, with trunk 2 to 4 or even 5 feet in diameter. Found throughout the colony, frequently forming extensive forests in swampy districts.

When grown on hill-sides, the timber is more compact and durable than when grown in swamps, which has led to the idea of two species being confused under the systematic name, but there is no direct evidence in favour of the supposition.

The timber is white and tough, and is well adapted for indoor work, but will not bear exposure. In Wellington and other places it is said to be subject to the attacks of a minute coleopterous insect; it is, however, possible that this is only the case when the timber is felled in the summer time and used in a green condition. There can, however, be no doubt that the timber is not in any way adapted for exposure, although it is occasionally used for general building purposes where kauri and totara cannot be readily procured.

In the Waikato it was used in the construction of some of the bridges hastily erected during the war. When in contact with the ground it speedily decayed, not lasting three years. Scarcely a beam was in sound condition at the end of five years, and in many instances large timbers were mere masses of decay.

Used for house timbers, wall-plates become hopelessly decayed in three or four years if in contact with the ground. As weather-boarding, painted on the outside, it is more durable, although not to be recommended for the purpose.

On the western side of the Kaipara district it is sometimes used for fencing-rails. When split of large dimensions and perfectly free from sap it will last from seven to eight years, but I have seen rails become worthless within two years of their being used.

In Dunedin I had the opportunity of comparing its durability as weather-boarding with the Baltic white deal (*Abies excelsa*), and found it decidedly inferior; but as the Baltic deal had been felled in the winter, and was doubtless in a seasoned condition when used, while the white pine was in all probability felled in the summer and used in a green state, the comparison was not made under fair conditions as regards the latter. The white pine may be said to hold a similar position, in regard to kauri and totara, to that held by the Baltic white deal in respect to the red or yellow deal (*Pinus sylvestris*) of Europe. It is specially adapted for flooring-boards, and for that purpose might be used with advantage in houses constructed mainly of kauri and totara.

Although of lighter specific gravity, its strength is about equal to rimu; it might therefore, within certain limits, be used for inside beams, &c., but its apparent liability to the ravages of insects will always prevent architects from recommending it to any extent. I have never seen exposed specimens of the timber attacked by insects. Contrary to what might have been expected, it appears to possess considerable power to resist the attacks of teredo. Mr. George, manager of the Wellington Gas-works, informed me that he had seasoned kahikatea in use for landing-stages in Wellington Harbour for two years before being attacked.

22. MIRO, also called BLACK PINE in Otago.—(*Podocarpus ferruginea*.)

Of similar distribution to the last, which it closely resembles. It is easily distinguished when in fruit, as the fruit is solitary instead of spicate. The cross section of the timber shows the heart-wood star-shaped and irregular. Much disappointment has arisen from the common names matai and black pine having been erroneously applied to the miro, which, under ordinary circumstances, is not a durable timber.

It appears, however, to be specially adapted for use in situations where it is partially exposed to the influence of sea water, and under these circumstances exhibits greater durability. A most instructive lesson on the durability of timber under different circumstances is afforded by an examination of the piling constructed for the protection of the railway embankment at the Bluff