

length, and 2ft. 6in. in diameter, and considerably smaller on the higher levels. Of late years this timber has been extensively used for sleepers in Canterbury. It is much given to warping and cracking, so is quite unsuitable for joiner-work; but it stands well in the ground.

Fagus fusca.—Next to kauri, *Fagus fusca*—called indifferently red, black, brown, and tooth-leaved birch—is perhaps the most important timber in New Zealand. It is strong, straight-grained, and durable, and of large scantling and in long lengths. It is scarcely suitable for fine joiner-work, being hard and easily split, and given to excessive shrinking and warping if not particularly well seasoned. It, however, answers well in house-framing, and is particularly well adapted for railway-sleepers and engineering works generally. It is also a good substitute for oak and English beech in staves for casks and tubs.

There is a curious belt of *Fagus fusca* in the Upper Waimakariri, referred to in Mr. Kirk's report of November last. It is from 5 to 10 chains wide, with *F. solandri* on each side, its lower edge being 5 or 10 chains from the lower edge of the bush. The belt extends practically from the Bealey to the Esk. It contains trees up to 3ft. diameter and 30ft. to 40ft. long in the trunk. The timber is good, but many of the trees are hollow, having long passed their maturity.

With the exception of occasional clumps of *menziesii* all the low-lying birch forest in Westland and Nelson is *Fagus fusca*. On the East and West Coast Railway the birch is first met with near the confluence of the Otira and Teremakau. There is a considerable patch here, and another on the north side of the Teremakau, at the entrance to the Paddock. It next appears in quantity mixed with pines between Lake Brunner and the Ahaura, and after that there is practically nothing but birch forest all the way to Nelson, and, in a less degree, right on to the Sounds.

The birch in the Teremakau is not very large: trunks up to 4ft. diameter are occasionally seen, but the average is not more than 2ft. 6in. or 3ft., the length of trunk being from 40ft. to 60ft. The heavy timber begins about Nelson Creek, and continues all the way to the Buller watershed, wherever the soil is favourable. The popular impression that birch grows on very poor land is only correct as regards the upland varieties, that affect a stiff clayey hillside. The largest *Fusca* grows in the valleys, where the soil is best. Birch trees up to 4ft. diameter and 80ft. or 90ft. in the trunk are quite common through the long stretch of country I have mentioned, and trees of still larger dimensions are frequently met with. I measured one in the Upper Grey 24ft. 8in. girth, 7ft. from the ground. This tree grows on one of the patches of schist soil I have previously referred to. There was a large number of trees in the same locality up to 5ft. diameter, and from 80ft. to 100ft. long in the trunk. One which had fallen alongside the track was 110ft. long in the trunk, 4ft. diameter at the base, and 12in. at the top.

An important point in connection with the birch forests on the West Coast is that the trees are of all ages, from year-old seedlings to hoary giants, long past maturity. I travelled through a remarkable patch of comparatively young trees in a valley near the Clarke River. They seldom exceeded 2ft. diameter at the base, but were of great height and perfectly straight. One cut down in making the track measured 80ft. long in the trunk by 21in. diameter at the base and 12in. at the top, the total length of the tree being 120ft. It was quite small when compared with hundreds standing round. Many of them only 18in. diameter at the base were 120ft. long in the trunk.

Silver Birch.—Silver birch (*Fagus menziesii*)—known also as red and white birch—is a far less important timber than *Fagus fusca*. The tree is not nearly so large nor straight, and the timber is neither strong nor durable. On the other hand, it is suitable for joiner-work, even of the finer kinds, being smooth-grained and soft, and not liable to excessive shrinking or warping. It also answers well for the light kind of cooper-work. The timber is, however, comparatively little used in any part of the colony.

Silver birch has no special habitat, but grows in small clumps and individual trees all through the beech forest shown on the map. There is a patch at the Blackwater, on the opposite side of the Teremakau from Kumara, and several in the Upper Grey, Inangahua, Maruia, Matakītaki, and Buller. The trees are seldom more than 3ft. in diameter and 40ft. or 50ft. long in the trunk, the average size being considerably less.

PINE FORESTS.

There is no forest of pine wood north of Teremakau. Numerous bushes and clumps almost exclusively pine are met with, and the timber is found in considerable quantities mixed with beech, but there is nothing that can be called a forest in its more comprehensive sense. On the other hand, there is practically no timber but pine south of the Teremakau. I did not see a single beech-tree of any description right down to Okarito, and I understand it is the same for fifty miles further south.

Totara.—Totara, probably the most valuable of the New Zealand pines, is not plentiful in the area accommodated by the proposed railways. In the extreme north of Nelson and the Sounds there is a fair sprinkling among the other trees; but, with the exception of two or three patches in the Buller and Grey basins, and a few smaller clumps and isolated trees at long intervals, there is practically no totara from Belgrove to Ross. From the Mikonui southwards totara in small quantities and of small size appears among the scrub on the richer river-flats, but it is too insignificant to notice. The only valuable totara bush that I heard of on the West Coast is on the south bank of the Wanganui, where there is about three square miles of good timber, fifty-feet piles being obtainable.

Matai.—The next best pine—matai—is also comparatively rare in the country under discussion. It only grows in very small clumps and individual trees among the other pines. Practically the Pelorus Valley is the only place where this timber has a commercial significance. The trees there run up to 4½ft. in diameter and 50ft. long in the trunk; but on the West Coast they seldom exceed 3ft. in diameter and 40ft. in the trunk. Matai has a high reputation for durability on the West Coast, but is not thought so much of in Nelson.