

(*Pennantia corymbosa*) are among the most common trees that come in. Moisture- and shade-loving ferns such as *Asplenium bulbiferum*, *Goniopteris pennigera*, &c., also make their appearance. It is to such an association that is here given the term "secondary forest." It is essentially a shady and fairly moist forest, and, unquestionably, conditions in such a forest are entirely propitious for the establishment of the primary-forest trees. What is more, it is here that certain of the forest-trees establish, and it is not until these conditions arise that such trees as tawa or miro can successfully do so. Kahikatea and rimu also may establish here, but these can and usually do establish very well in much more open secondary forest, as will be mentioned later.

The foregoing is essentially the normal process of regeneration on the better soils and under no stocking whatsoever. We may with safety look upon any soil that goes through a dominant wineberry-lacebark-mahoe phase as being good potential grassland soil. Such is the succession in the gullies and better slopes of the Taranaki back-country.

SUCCESSION AFTER A GOOD BURN AND WITH LIGHT STOCKING.

Reverting back to the forest-burn, and presupposing a clean burn and a fairly successful take of grass, spear-thistle and catsear, as before mentioned, occupy their quota of ground. On the bare knolls also pipiriri (*Acaena Sanguisorbae*) will have successfully established, and if the area felled was forest into which sheep have had access, or if the burn has been stocked in the first year with sheep from pipiriri-infested areas, then this plant may be very common on all the drier knolls where the grass has failed to take. If such a pipiriri-infested burn is stocked entirely with sheep, so soon as the grass surrounding the drier knolls is eaten bare the pipiriri will spread, and in five or six years under constant sheep-grazing an almost pure association of this plant will have resulted (Fig. 8). Under cattle or mixed stocking it does not spread, and is gradually reduced until it virtually disappears. Hence on cattle-country it takes no part in the succession.

In the second or third year of the new burn, in the shade of logs and around stumps, water-fern and hard fern (*Paesia scaberula*) establish themselves. Hard fern also occupies dry knolls, establishing firstly in some shady crevice or niche of the knoll (Fig. 9), and then spreading outward by means of its wiry overground runners. Stock do not care for these two plants, and no matter how hard-pressed they may be they will not eat hard fern. At fairly high altitudes where there is more rain water-fern may form, under light stocking, an almost pure association. Hard fern, however, is the more important one as far as natural afforestation is concerned. Stock do not eat it, and once it gets well established and just so long as the area is kept stocked and the grass thus kept short the hard fern will spread. Ultimately the clumps will have so enlarged and the feed be so reduced that all stock, practically speaking, are forced off the area (Fig. 10). In this hard-fern association, then, we have a very decided phase in the succession to forest.

While the spread of hard fern has been going on, and particularly under sheep-stocking, the next phase in the succession has commenced. Bracken-fern, under light stocking, makes its appearance in