quotations from European, Indian, and South African practice, Sir David Hutchins proceeds to outline a general working plan for managing Kauri forests. He considers that the Kauri tree of the future must be one which will mature at 90 or 100 years, at which it will be 24in. in diameter, with about 3in. or 4in. of sapwood, and about 60ft. of bole. In mid-European forestry Spruce gives usually the best returns, and its rate of growth in the best quality of forest resembles that of the standard timbers in New Zealand—Kauri, Totara, and Rimu. In first-quality European Spruce forest at the age of 80 years (when the timber acrim is at the highest—viz., 200 c.ft.) the average tree is 1 ft. in diameter and 93 ft. total height. In Spruce forest of average quality (when the timber acrim is barely past the maximum—viz., 140 c. ft.), at 100 years of age the average tree is 10 in. diameter and 79 ft. high (Schlich's Yield Tables). This is an indication only of what should be the economical size of the Kauri tree of the future, for Kauri must be grown larger in order to get a fair proportion of heart-wood."

"A Kauri tree 2 ft. diameter under bark at base (or, to speak quite accurately, above the base bulge, which is very small or sometimes quite absent in Kauri) and 60 ft. of bole, if one allows 5 in. of diameter for taper to the centre of the trunk, would cube 118 c. ft. This is the true volume. Taking what is approximately the cubic content of the squared log by the English log rule of "the square of the mean quarter-girth" (Hoppus), the Kauri tree of the future will have a cubic content of 93 c. ft. quarter-girth. Allowing 25 per cent. for waste in sawing, 93 c. ft. q.g. would represent 837 sup. ft. of sawn timber. If, however, one took the "two-thirds-diameter squared" log rule which is used in nine States of the United States of America, the superficial feet would work out to 801.4 sup. ft., or 890 board feet, taking Professor Somerville's general factor for the chief American log rules. As will be seen later, I take rather more height and less taper than the average Kauri, as the "Kauri tree of the future" will be a tree grown in close forest; and I assign it a cubic content of about 100 c. ft. quarter-girth measurement."

"In the plan for a normal Kauri forest sketched here the acrim, it is evident, will be low till the better growth produced by the foresters' regeneration methods have taken effect, and the revenue will not be benefitted till that timber is fit to cut. I will assume that a few years after regeneration there will be an acrim of 100 c. ft., and that this acrim will spread gradually over the whole forest as the present crop of timber is cut and the forest regenerated. It will be 100 years before the first of the regenerated Kauri is fit to cut; and if twenty years be taken to work through and regenerate the old virgin-forest timber, it will be 120 years from now before the improved regrowth forest is all fit to cut. In the meantime the fellings and revenue will only be from thinnings and from the mid-rotation Kauri reserved trees left over when cutting out the old timber of the virgin forest mentioned above. Then, from 100 years the revenue will be rising rapidly as the first of the improved forest matures.

"As mentioned above, I assume for the normal Kauri forest, after the virgin-forest timber is cut, and during the 100 years of the "transition period" that must elapse before the regrowth timber matures, an average yield of 35 c. ft. q.g. of millable timber per acre per year—15 Kauri and 20 other. After that, 100 c. ft. q.g. Kauri per acre per year of millable timber. This 100 c. ft. q.g. is the normal yield. It will never be less than 100 and may rise gradually to 200.

"During the 100 years of the "transition period" there will be less than 35 c. ft. q.g. to cut at first, more afterwards.

Forty Lean Years, with Fat Years at the End.

The 35 c. ft acrim will be made up at first of light thinnings among the secondary species and some deferred regeneration fellings of the Kauri virgin forest. These at first will yield nothing like the 35 c. ft. per acre per year, the average yield estimated for the whole period. This, in fact, will be the lean period in the working of every Kauri forest, just as seventy or a hundred years later there will be a fat period with a plethora of mature Kauri. It will be the business of the "working plans" forest officer to so anticipate and defer fellings that the yield will be more equalised, and with it, of course, the distribution of the age-classes. He can help the lean years by running some of the virgin-forest fellings into them; he can help the plethora years by anticipating or deferring the felling of the 100-years rotation; and in doing this he is helped by nature, for that is the time when Kauri is growing rapidly and holding up its acrim against any rapid decline. In other words, there will be large supplies of Kauri timber on hand, and it will depend on the timber-market and on Government demands whether the timber is harvested twenty years sooner or forty years later. What the forester will be looking at will be a good distribution of age-classes in the felling compartments. Ultimately there will be a series of compartments with ages varying from one year old to 100 years old dotted about the forest and numbered from 1 to 100.

Towards the end of the "transition period" there will be a quantity of timber amongst the secondary species that will have to be thinned out, and some of the Kauri timber that in size will be nearly equal to the "Kauri tree of the future," with 2 ft. diameter and 60 ft. bole. The average 35 c. ft. acrim of the "transition period" will be derived mainly from four sources:—

(1.) Virgin forest; some deferred regeneration fellings.

(2.) Kauri reserves at the mid-period.

(3.) Heavy thinnings towards the end of the "transition period."

(4.) Where suitable, twenty-year crops of butter-box and packing-case timber planted in vacant places.