

pruning is necessary; but, when the trees are about thirty years old, science is called in, as the trees will have to be given more room to enable them to thicken their trunks, and, by increasing their girth, to put on wood where it will be of most value to the lumberman. Thus, the required length of trunk having been attained at an early age, it is now necessary to remove the weaker trees in order to give the stronger ones more room to develop their trunks.

### Thinning.

The guiding principle, in thinning

the following figures for a mixture of Scotch pine, beech and spruce in the Black Forest:—

Age in years.	No. of trees to acre.
20 ... ..	3,960
40 ... ..	1,013
60 ... ..	449
80 ... ..	346
90 ... ..	262

### The Forest at Isen.

The next forest we visited was at Isen, about thirty miles east of Munich. A branch railway runs through this forest.

The Forest of Isen is about 6,000 hectares (15,000 English acres) in



(Courtesy American Lumberman.)

Planted Spruce in Saxony, 10, 20, 30 and 50 Years Old.

out, is to avoid the breaking of the overhead canopy or the opening out of the forest to such an extent as to let in too many cold draughts, as the trees have been reared under shelter and will thrive best if the shelter is maintained.

I believe success depends, to a great extent, on judicious thinning, which is done every ten years or so, until the trees have reached maturity, when the final cutting will be done.

Professor Schlich in his Manual, Vol. II, page 209, 2nd edition, gives

area. As at Forstenrieder, so here, I was much impressed both by the uniformity of the trees in size, and by the regularity of their distribution. The land appeared to be carrying the maximum amount of timber, all of which seemed to be clean and healthy. I was also struck by the number of saw-mills distributed along the outskirts of the forest. With the local industries on the spot, the cost of haulage is reduced to a minimum; and the amount of permanent local employment provided must be considerable; when a tree is cut down,