

Seed beds are sometimes established in the neighbourhood of a forest at the same time, to furnish young plants for the filling up of vacancies, which, however, are also obtained nearly as good out of the forest itself from places where the plants stand thick enough to admit of it.

Altogether the aiding of the natural reproduction by artificial means, either sowing or planting, is at the present time generally resorted to at once, as such measures always lead to a more satisfactory accomplishment of the desired regeneration, and save time. The amount of light to be admitted by this felling varies greatly according to soil, position (if in the plains or in the hills), and the exposure of the forest.

Success of the natural reproduction in the beech forest must vary, therefore, greatly with the judgment and discretion of the forester, as he has to adapt the treatment of the forest to the circumstances of the case.

Natural reproduction seems to require especial care on southerly and westerly slopes, where the sun has greater power, and dries up the surface of the soil much sooner, and lets the weeds grow much faster, if clearances are made to the same extent as on level ground, or on northerly and easterly exposures.

I had several opportunities of witnessing cases where, on southerly slopes, year after year new attempts were made to re-stock the hill sides with beeches without succeeding, and at last the spruce, or even Scotch fir, had to be resorted to instead of the beech to make use of the ground.

The third felling is called cutting for light (*lichtschlag*), as its chief purpose is to admit light and air in greater abundance as the young trees require it. This is generally commenced when the seedlings are two years old. It is also regulated very much by circumstances; and whilst in the one case the parent trees may be required longer on account of the spring frosts, so injurious to the young beech, in others their early removal is necessary, even if an increase in size be sacrificed, for the establishment and vigorous growth of the young trees. Neither do partial failures prevent the removal of the old trees, but are adjusted at once by sowing or planting as the safest and most expeditious mode of securing the establishment of the young forest. The cutting for light.

After the third or light felling, follows the gradual removal of the old trees, or final clearing, which is regulated in the first instance also by the requirements of the young trees, and after this by the fixed yearly out-turn, as laid down in the working plan, and other circumstances. Final clearing.

As a general rule, all these fellings are carried out gradually, without causing sudden changes in the forests. The aiding of natural reproduction is either accomplished by sowing, if failures are perceptible at the early stages of it (such as insufficient germination of the seed or early dying of the seedlings), or by planting, if the seedlings get destroyed later by spring frosts, or are choked by weeds. Aiding of natural reproduction.

The sowing is carried out in the forest on strips two feet wide, in furrows, or on patches 2 feet to 3 feet square, prepared by hoeing for the purpose, and by loosening and levelling of the soil; whilst planting is done with seedlings 2 feet to 3 feet in height, taken from adjoining nursery beds, or from spots in the forest where there are more than are necessary.

It is evident that if, with all this great care and attention to aid natural reproduction, still occasional failures occur, how much more unreasonable it is to expect forests in India to keep in an equally rich and thriving condition if left to themselves, or worked only with a view of extracting the timber from them.

No mode of growing the beech suits it better than in high, pure forests, it liking the deep shade and coolness of the soil which its dense foliage secures for it, and improving the soil more than any other forest tree by the abundance of leaves shed every autumn, forming a rich vegetable mould, and facilitating the decomposition of the mineral and vegetable substances in it. Such forests are allowed to grow in a rotation of 80 to 120 years before the regeneration or final clearing is carried out, whilst all thinnings previous to this are considered as the result of measures for the improvement of the forest, the object in undertaking them being to improve the condition of the remaining trees. The general rule is to repeat thinnings often, and to remove little at a time. Pure high forests of beech.

I had also an opportunity of seeing a modified form of beech high forest, in which, at an age of about 60 years, a large number of the trees were felled and removed, whilst the new covering of the soil for the benefit of those left standing was accomplished by again sowing beech underwood amongst them, which had much improved the old trees left, and resulted in a proportionately rapid increase in size. "Conservations-hieb" introduced by Forstmeister Seebach in the Solling forests.

In coppice woods it occasionally happens that the beech is allowed to remain if it comes up, but otherwise it is not much adapted for this mode of growing wood. The beech in coppice woods.

In middle forests or coppice under standards, it is frequently spared by the woodcutter, although not so well suited for high trees, in such a combination, as the oak and other trees which give less shade. The beech in middle forests.

The greatest danger that beech trees, especially when young, are exposed to, are the late spring frosts, which do great damage, and can scarcely be obviated. They do most damage in valleys or other low places, the neighbourhood of water, &c., where there is no current of air. Danger to beech forests from spring frosts.

Another enemy is the sun, which, if beech stems are suddenly exposed to its glare, damages and destroys them rapidly, as I had an opportunity of witnessing, although the trees were about 50 years old. Danger from sudden exposure to sun.

Not unfrequently trees whose timber is of greater value than that of the beech are scattered in the beech forest, to derive the benefit from the rich vegetable mould formed by the beech, but care is taken that such trees, when placed amongst the beeches, are sufficiently advanced as not to get choked by the latter. The trees thus employed are chiefly oak, ash, maple, larch, and Scotch fir. Other trees in the beech forests.

I saw a remarkable instance at Rothenkirchen, where beech had been planted under oak of about 120 to 150 years old, standing on old grazing grounds on which the villagers had been entitled to graze their cattle, and to various other privileges. After it had been freed from these burdens by the villagers receiving other land, the oaks were stagheaded and altogether deteriorating, when beeches were sown and planted underneath, and these so benefited the oaks, that they had made new, vigorous shoots and become covered with leaves again, and were now, with the beeches under them, in a condition to grow for as many years again as they had done already. The beech in other forests.