

in which Germany is very rich, rules and regulations for the guidance of the forest officers and subordinates, working plans, &c., &c.

As I spent most of my time in the reviers of Springe and Lauterberg-am-Harz, I shall confine my remarks mainly to these districts.

The Springe Revier is situated in the neighbourhood of the town of Hanover, from which it is reached by diligence in three hours (a railway has just been opened). The forest, which includes an extensive game preserve, known as the "*Sau-Park*," may be considered as in the plains, although it ascends and clothes the sides of a low range of hills. The *Oberforsterei* is extensive, covering an area of some 19,000 morgen, or about 12,000 acres, mainly covered with oak and beech forest. Favoured by situation and depth of soil, the formation is mostly oolitic limestone and sandstone, the growth in this revier would be exceptionally good were it not for the damage done by the deer and wild pigs, which is very great, so much so that it has been found necessary to fence off the portions being cleared to allow of natural reproduction taking place. Springe Revier.

As this plan of natural reproduction forms one of the most important points in the German system of forestry, it appears as well to describe here how it is conducted. Natural reproduction.

It has been already stated that the *Umtrieb*, or rotation of crop and periods into which it is divided, are fixed in the working plan. The usual *Umtrieb* for beech hoch-wald in Hanover is 120 years, divided into six periods of twenty years each, that is to say, when the forest has been brought into proper order there should be as nearly as possible equal areas under crop in each of the six periods, viz., from one year to 20, from 20 to 40, and so on. It is not imperatively necessary that the total extent in each period should be together; there may be 500 acres in one place and 50 in another, but it is advisable to group them as much as possible, and work each tract regularly in succession, having regard to the direction of the prevailing winds, which do incalculable damage if once allowed to get into a forest by injudicious felling on the windward side. When a block arrives in the last period, felling is commenced by what is called a *Vorbereitung* or *Besamungs-schlag* (preparatory or seed-clearing), which is very slight and scarcely to be distinguished from the ordinary thinning carried on in the former periods. This is followed by a *Licht-schlag* (clearing for light) in the first year after seed has fallen (the beech seeds every fourth or fifth year), with the object of, 1st, preparing the ground to receive the seed; 2nd, allowing it to germinate; and 3rd, affording sufficient light to the young seedlings. The finest trees are, as a rule, left standing, with the two-fold object of depositing the seed and sheltering the young trees as they come up. If there is a good seed year and sufficient rain, the ground should be thickly covered with seedlings within two or three years after the first clearing, but it is generally found advisable to wait for a second seed year, and aid nature by hand-sowing, transplanting from patches where the seedlings have come up very quickly to the barer spots, and turning up the turf, and so giving the seeds a better chance of germinating (*vide* Report on Lord Seafeld's Woods).

When the ground is pretty well covered the old trees are felled and carefully removed, so as to do as little damage as possible to the new crop, and the block recommences life, so to speak, nothing further being done until the first thinning.

The time allowed to elapse between the preparatory and the final clearing naturally varies much, according to situation and circumstances. In Hanover it rarely exceeds 15, and is often as little as eight years, but there would appear to be a growing tendency in other provinces to do away with this system of so-called "*Kahltrieb*," and remove the old trees so gradually that there can scarcely be said to be any clearing at all, the new crop being well advanced before the last of the parent trees is removed. This new system finds much favour in the Black Forest, as will be explained hereafter. At Springe the woods in the first period, where the final felling was going on when I was there, had, as I have stated, been fenced off so as to exclude the deer and pigs, and the natural reproduction had been particularly good, the hill slopes being thickly covered with seedlings; but a new and formidable enemy had presented itself in the shape of field mice, which nibble round the bark just above the surface of the ground. Thousands of seedlings had thus been destroyed, and as fast as blanks were filled up by transplanting the young trees were attacked and killed. I left the Oberforster in despair at the wholesale destruction which was thus going on, and which, with all the knowledge and appliances of modern forestry at his command, he was powerless to prevent; but I have no doubt a sufficient stock will, after all, be left, supplemented by a little transplanting from the nurseries, which are well stocked.

The deer do great damage in the older beech woods by stripping the bark from the trees. These have then to be felled within a year or eighteen months, which interferes with thinning operations in other localities, and precludes any regularity in carrying on operations and bringing the forest into proper order. These beech thinnings are cut into billets and piled ready for sale as firewood. The price realized is only about 4s. 2d. per cubic metre, say 1½d. per cubic foot, which is very low.

I inspected tracts containing oak, beech, &c., representing all the periods, and compared the growth, as recommended by Dr. Brandis. There are some very fine beech woods in the second and third periods, but to my eye they required thinning, having fully double the number of trees to the acre which would be left in England. This, however, I afterwards found universal in German forests as compared with those I have seen in England and Scotland, and forms a vexed question on which much has been said and written on either side, too much to be summarized in this report; probably a happy medium would be found to be the best, and the peculiar circumstances of climate must always have much to say in such matters.

It may, however, be stated, with reference to the remarks regarding pasturage in my report on the Scotch forests, that the presence of grass in plantations or young woods is throughout Germany considered as a sure sign of a faulty system of treatment, and consequently more or less unhealthy state of the trees. It is mainly with the object of preventing this that oak woods are planted up with beech, which grows well under shade, and covers the ground so as to exclude the light, which, if admitted, must produce a growth of grass or herbage. The conditions under which the oak grows best being tersely expressed in German "*Kopf frei boden bedeckt*" (Anglicè, Crown free soil covered or sheltered). I have, however, seen grass growing in English plantations which were very thick, and Presence of grass in plantations.