CERTAIN FEATURES OF GERMAN FORESTRY

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German forestry, perhaps because it is the most scientifically developed of any in Europe, has been for many years a source of deep interest and profitable study on the part of American students of forest management and utilization. There are those who predict for America, before many decades shall have passed, forestry conditions similar to those now existing in Germany. That we may in time develop in America a scientific as well as practical scheme of forestry, no one can doubt, but that it will in any way resemble German methods seems wholly improbable, unless we can make over our methods of taxation and administration of public lands. German forestry pays its way. Forestry is a sort of government trust in Germany. Without the connivance of the government it would no more pay to grow timber for any purpose other than for firewood in Germany than in the United States. Germany imports vast quantities of timber, but the duty is so adjusted that it is a paying proposition for the German states to invest money in long-time rotations of forest crops. With a high stumpage value, the owners of the German forests, either private or state, can afford to make a more complete utilization of all the products of the forest, can afford more careful methods in logging, and can afford the expense of replanting and protection. The entire expense is put where it belongs, that is, on everybody, because everybody is directly or indirectly a consumer of forest products. I wonder how many advocates of conservation of our forest resources in the United States realize that low tariff on imported timber means low stumpage values in our own forests and that low stumpage values mean waste and high speed in lumbering?

The German forests present an almost endless variety of conditions with respect to management and utilization, and the observant forester will find therein much food for thought in connection with forest conditions which prevail at home and he will discover therein many new ideas that will be of benefit to him in coping with American problems in forestry.

The following sketches are taken at random from my notes with a view of presenting characteristic and interesting methods of procedure in sylviculture, management and utilization, particularly of such ranges in the German forests as may well pay any student of forestry to visit who has the opportunity to travel.

1 THE PINERIES OF EBERSTADT NEAR DARMSTADT

The forest range of Eberstadt consists of both town and state (Hesse-Darmstadt) forests, some 2500 acres, under the direction of Geh. Forstrat Joseph, an elderly man of kindly and delightful personality. The activity of the state in buying up odd or unproductive strips of privately owned land has resulted in the same policy by the town of Eberstadt, so that there are few privately owned forests here. Natural seed regeneration of the Scotch pine, which is the principal tree here on the sandy plains of the Rhine valley, has not done well. This is in striking contrast to the pineries of Ysenburg, 20 miles north, where the luxuriant natural regeneration is depended upon almost wholly for reforestation.

The rotation at Eberstadt is approximately 120 years, at which time the larger trees attain an average diameter, breast high, of 12 to 16 inches. The cuts are made in winter and in the succeeding winter the ground is dug over to a depth of about 14 inches, the best soil of the forest floor being turned under and the poor sand from below placed on top. This will force the roots to go deeper for their food. In April, one year old seedlings of Scotch pine are planted, and between the rows, in May, potatoes will be cultivated. This method of "tongya" gets rid in a large measure of the weeds and soil fungi which might be harmful to the young pine, especially Hysterium pini. At the time of the logging operations there were left standing, in the majority of cases, about eight of the best trees to an acre, to run through the next rotation as "veterans." In addition to the increment yield of these trees, which takes place practically without injury to the growth of the next rotation, the price increment of these veterans rises from a stumpage value of under $40 to over $60 a thousand.

The cost an acre of reforestation at Eberstadt is:

To dig over the soil	$27.50
For plants and planting	10.50
For potatoes	4.00
For planting and cultivating potatoes	6.00
For weeding, paris-greening, etc	8.00
Making a total gross expense of	$56.00

About 1400 pine seedlings are planted to the acre and about 6 hundredweight of potatoes are used on each acre. The net returns from the potatoes usually average about $20 an acre, which leaves a net planting expense of $36 an acre. Adding this to the value of the land, which is here as high as $100 to $150 an acre, to obtain

Plate I

Various stages of Scotch pine regeneration as practised at Eberstadt

the amount of the original investment, and figuring at 6 per cent compound interest and including also taxation and protection, one can imagine that at the end of 120 years the value of the Scotch pine produced will scarcely yield a profitable return upon the investment, not even with the present high value of timber in Germany.

As the oberförster, however, is required by regulation to replant, the net planting expense of $36 is charged by him to the logging expense of the last rotation and the new growth starts with a clean bill of health, financially. It is burdened with only the soil value, taxation and protection expense upon the books; and the deduction of $36 from the receipts of the sale of timber does not seriously effect the profitable appearance of the forest accounts. In other words, the unique thing about this range is that merely by the method of bookkeeping the forest investment represented at Eberstadt is a profitable one instead of a loss, and the planting expense does not hang with its accruing interest as a burden upon the financial success of the next rotation, to be eliminated, possibly, only by the first or second thinnings.

Because of the abundance of rabbits and deer, all the young plantations must be fenced. Woven wire fences are necessary, for which the annual expense on this range of 2500 acres is $500, but the item does not appear in the planting expense. There is an annual revenue from hunting privileges of $2000, and here again the oberförster shows his keen business ability in keeping down the value of the investment by charging this fencing expense to the revenues received from hunting privileges, rather than to the cost of reforestation. As a result of all this the range yields an annual net revenue of something over 3 per cent. It must be borne in mind, however, that the gross receipts are very large and that the cause of the low net revenue which prevails in practically all German forests (rarely rising to 6 per cent) is due to the relatively high valuation placed upon the soil in estimating the value of the investment.

2 THE PINERIES OF YSENBURG

Ysenburg is situated on the level, sandy plain of the Rhine valley, a few miles south of Frankfurt. Three or four centuries ago the holdings of the princes of Ysenburg constituted one of the hundreds of small principalities of the old German empire. Napoleon reduced these to but a few in number and the Landgraf (now Grossherzog or Grand Duke) of Hesse-Darmstadt received dominion over Ysenburg. The princes, however, retained their land, if not their