

FORESTS AND THE STATEMENT

We take the following from Mr. R. W. Phipps report to the Ontario Government:

To obtain knowledge on this head, no better source of instruction is available than the extensive report made on the subject by Captain Walker, a gentleman who passed nine months on the continent, by direction of the European Government, for that purpose. I cannot copy his voluminous report, but will give a short review of what refers to each country visited, and anything likely to be useful for our purposes here in Canada. The Captain first visits Hanover, describing the system in which territory to some extent describes all, for he tells us that the system there may be considered as typical. He gives then, the administration there, and a brief statistical record of the others, except in those points where they decidedly differ. Now, as to Hanover.

HANOVER.

Its forests under State management amount to 900,000 acres. Some are Government, some Church, some belong to municipalities or communes. Government manages the forests by officers appointed, while the community pay four cents per acre towards the pay of the officers. The method appears to be that of giving the owners as much wood, pasture, or litter for manure, as their original right to the forest entitled them to; but to give it at the hands of Government officials. If the forest is of sufficient extent to employ a special officer, the commune, instead of the four cents, are charged his pay and allowances, as well as other working charges.

The government forests are about 600,000 acres of the above, and the cost of working and all expenses is about \$650,000 annually, the receipts being \$1,600,000, and the profit therefore \$850,000, or, taking the actual figures, about \$1.60 per acre per annum. This, of course, takes no account of the value of the land, or what it might rent or sell for if cleared.

Hanover is a province of Prussia. The head office is therefore in Berlin. The forest establishment of Hanover consist of one director and over-forest master, who is also a councillor; twenty forest masters in charge of circles or divisions, forming also a board of management in all forest matters; one hundred and twelve over-foresters in charge of forest districts (*revier*) averaging seven or eight thousand acres each; four hundred and three foresters who assist the over-foresters, and have charge of portions of a district; three hundred and forty-three overseers, under-foresters, etc., employed in watching and protecting the forest, and supervising the work that is executed by hired weekly or daily labor, or on contract under supervision of the fixed establishments. A cash-keeper is attached to each over-forester, who receives and disburses all moneys out of the forest cash chest, with which the over-forester has nothing to do, although his accounts should, of course, tally with those of the cash-keeper. For payment of laborers, etc., he gives orders on the cash-keeper, whose books are examined by the forest-master in charge of the division, and accounts rendered to the head office in Hanover, and thence to Berlin.

All the forests have been surveyed, valued, and divided into blocks in this manner:—

Besides those already enumerated, there is, for the sole purpose of measuring, valuing, and framing working plans for the forest, a superintendent, draughtsmen, and clerks, generally practical foresters, and a staff of surveyors and forest valuers, who are generally candidates for the position of over-forester.

When a forest was about to be taken in hand and worked systematically, a surveyor and valuator were despatched to the spot, the former working under the directions of the latter, who placed himself in communication with the local forest officer and the inhabitants interested, and obtained from them all the information in his power. The surveyor first surveyed the whole district, then the different divisions, as pointed out by the valuator, who defined them according to the description of the timber standing, and any conditions affecting the nature of the trees to be grown in future. While the surveyor did this the valuator valued the trees, formed a register of rights with a

view to commutation, considered the best plan of working the forest, the roads, in fact, all which enabled him to form a plan for the head office, and a subordinate plan to be handed over to the executive officer as his "standing orders."

The valuator and surveyor return to head quarters, and prepare the maps and plans, which are submitted to the board of forest masters, the forest director and other councillors of the Finance Department, who are thus prepared to listen to any objections made by communities or individuals, which are very rarely made now, as the people have learned that the action of the officers is not adverse to their interests, and are willing to allow them to settle matters.

The executive officer has thus in his hands maps showing each division of the forest tract in his charge, and instructions—the quantity to be felled yearly, the extent to be planted, the state in which the forest should be ten, twenty or a hundred years after the plans were made, all calculated—so that the over-forester has only to carry out the instructions given him, allowances being made for unavoidable difficulties—failure of seed, occurrences of storms, and the like.

The forest-masters have no executive work, but control four to six over-foresters, of whose labor they make frequent reports to the Director (both in forest and office work). The over-foresters give annual report of operations. They spend most of their time in the forest, supervising the felling, planting, sowing, thinning, carting and selling of timber. The laying down of roads is done by a forest officer, but the actual work is carried out by the local officer, who has also much office work, giving grazing licenses, etc., and preparations of returns, but his work is out of doors compared to that of the forest-master, who has more office work; comparing operations and rates in the districts, collecting statistics, settling disputes, and as a member of the forest committee, revising working plans.

The main object aimed at in any scientific forestry is, to convert the natural forest, consisting of trees, young and old, good and bad, too thick and too thin, into blocks of trees of the better description, of the same age, and capable of being worked—that is, thinned out, felled, and reproduced, or replanted, in succession, a block being taken in hand each year. In carrying out such a system, considerations must be attended to, such as the relation of the block to the whole forest system; the needs of the people in timber, firewood, leaves for manure and pasture; the soil, the situation as regards winds (which must be attended to in felling to lessen damage), and precautions against insects, fire, trespass or theft.

The plans need revising every twenty years, though it is marvellous to notice to what an extent the original scheme has generally answered.

After a forest has (to give some idea of management) by thinning, planting, and so forth, been gradually got into perfect order as described, the system of natural reproduction forms great part of the German method. It is as follows:—

The rotation and periods are fixed in the working plan. For beech "hochwald" it is in Hanover one hundred and twenty years, divided into six period of twenty years each, that is to say, when the forest has been brought into order there should be nearly equal areas under crop of trees in each of the six periods, that is from one year to twenty; from twenty years to forty, and so on. When a block arrives in the last period, felling is commenced by what is called a preparatory clearing, followed by a "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 for the seed; 2nd, allowing it to germinate; 3rd, affording light to the young seedlings. If there is a good seed-year and sufficient rain, the ground should be covered with seedlings in two or three years after the first clearing; but it is better generally to wait for a second seed year, and aid nature by hand-sowing, transplanting from the patches of many to the bare spots, and turning up the turf to give the seeds a better chance of germinating.

When the ground is 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 till the first thinning. The time allowed between the first and final clearings is from eight to fifteen years. But in many provinces they do away with this system, and remove the old trees so gradually that there can hardly be said to be any clearing at all, the new crop of trees being well advanced before the last of the old trees is removed.

In these forests can be seen all the periods of growth—nurseries and schools for seedlings, which are transferred thither, at the age of two to four years, from the seed beds, and are pruned and transplanted as often as seems required till finally planted out, sometimes not till twelve or fourteen years old. There are many methods of planting adopted here. The steepest and most rocky sides of the hills are covered with forests, which have been created by the labors of the Forest Department. In many such places, where even the few handfuls of soil placed around the young tree had to be carried some distance, it is not contended that the first plantation will yield a pecuniary profit, but the improvement in climate by the retention of the moisture, and reclamation of large tracts formerly barren and unproductive, is taken into account; besides which the dropping of leaves and needles from the trees will ere long create a soil and vegetation, and insure the success of plantations in future years, and consequent surplus.

PRUSSIA.

Prussia has twenty millions of acres of forests, ten millions of which are private, and the remainder, with which we have more to do, state, commercial, and ecclesiastical.

Of these the income is \$14,000,000, and the expenses \$7,500,000, leaving \$6,500,000 clear. This will not show much, in fact not more than 65c. per acre, but there are other returns of more than mere yearly revenue importance. When it is considered that this result is arrived at without trenching upon the capital or stock of timber in the forests, which, on the contrary, is being increased and improved in every province of the kingdom; and that the indirect value to the people of many forest privileges, which they exercise free of charge, must be very great, not to mention the benefit to all in the shape of public recreation grounds and an improved climate, some idea may be arrived at of the enormous value and benefit such a system of state forests must confer on Prussia.

The forests, as already stated concerning Hanover, form part of the Finance Department, and are presided over by an overland-forest-master, and ministerial director, aided by a revenue councillor and joint ministerial director, and a numerous council or board.

There are two forest academies, one near Berlin, and one in Hanover. The overland-forest-master is curator of the academies, and at the head of each is an overland-forest-master, who is aided by a numerous staff of professors and assistant-professors.

There are twelve provinces in Prussia, divided into thirty circles, and to each an over-forest-master, who is appointed to represent the forest department in the council of local administration, and is aided by councillors and by the forest masters as a board, to represent forest interests in the government. Next in order comes the forest-masters, numbering one hundred and eight, in charge of divisions with an average area of sixty thousand acres, and then the executive officers, seven hundred and six over-foresters, to each of whom is 7,000 acres, and to each of whom is attached a cash-keeper, and three thousand six hundred and forty-six foresters, or overseers, with ranges of a thousand to three thousand acres.

At the academy near Berlin are seven professors with assistants. There is an experimental garden attached, with an over-forester in charge of the technical portion, and professors for the meteorological, zoological, and chemical sections. The number of students averages sixty-five. The varied apparatus includes a building where the seed is dried and separated from the cones, large seed-beds of spruce, fir, and willow, full opportunities of transplanting

seedlings, and examples of every kind of trees for botanical study.

There is here a museum, rich in specimens of all sorts of birds, animals, and insects found in the forests. In cases where the animal or insect does damage to trees, specimens of the branch, bark, leaf, or cone, in a healthy state, and after being attacked, are exhibited close to each, so that the students can see at a glance the nature of the damage, and connect it with the animal which causes it. Thus we have squirrels, rats, beavers, and mice, set up gnawing at the barks, grubbing at the roots, etc. Insects are shown in the several stages of their existence—larvæ, chrysalis, caterpillar, moth, with their ramifications in the stem or branches of the tree. These, with specimen blocks of almost all descriptions of timber, form a most instructive collection. There is a forest district attached, remarkable for the growth of Scotch fir and spruce on a poor sandy soil, and in spite of repeated attacks by insects.

Nothing is more remarkable than the extent of study required from forest candidates, and the number of years they are content to spend in studying or waiting an appointment. The would-be over-forester, which is the lowest of the gazetted appointments, must pass certain terms at a Government school, a year in a district with an over-forester, an examination as forest-pupil, two years at a forest academy, an examination in scientific forestry and land surveying. He is then a forest candidate. Then two years practical study, nine months of it doing duty as an actual forester; then another examination. He is now an over-forester candidate. The first examination tests his theory; the second his practice. Then he will be occasionally employed in the academies, or in charge of a district, only then getting allowances. After five years of this he may look for steady employment.

Thus five years without pay are given in study; five in probation with but meagre pay when employed, and the time is often longer, before regularly installed. Yet so great is the desire for Government—especially forest—service, that there are numerous candidates.

The qualifications for admission into the subordinate grades—forester, sub-forester, overseer—have a military tendency. Candidates, after two years in the forest, enter a jäger battalion, and bind themselves for twelve years' service. After three years they obtain leave, and are employed in the forest as huntsmen or game keepers. After eight years they must have passed the forester's test, which consists in six months' charge of a district, and an examination. At the end of twelve years they are discharged with a certificate entitling them to employment in the forest establishments. The appointments are much sought after, and in 1867 there were two hundred and twenty-one applicants for one hundred and forty-five vacancies, but many are absorbed by communal and private forests.

In some provinces the Prussian Government has certain rights concerning the management of even private forests—in others none.

While on the subject of Prussia, it may be well here to insert some extracts from a letter received from Baron Von Steuben, a Prussian nobleman, now Royal Chief Forester of the German Empire, by the Forestry Congress, at Cincinnati, in April of last year. He remarks:—

"There can be no doubt that every country requires a certain quantity of well-stocked woods, not only to supply the demands for building material and fuel, but more especially to secure suitable meteorological conditions, to preserve the fertility of the soil, and out of sanitary considerations. The ratio of the minimum quantity and judicious local distribution of the indispensable forest to the aggregate area cannot be expressed by a universal rule, but the same can only be approximated by scientific investigation. Above all things, it is essential to prevent forest destruction where such would injuriously affect the fertility of the soil. It is important, then, to preserve and to cultivate judiciously those forests which stand at the headwaters and on the banks of the larger streams, because, through their indiscriminate destruction, fluctuations in the stage of water, sand-bars, and inundations of arable lands are