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Impressions of German Utilization

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To an American forester, accustomed to our extensive practice of forestry and our rough methods of utilization, the closeness with which the Europeans utilize the products of the forest is truly a revelation.

It has been estimated that in the past only about 40 per cent of the trees actually felled by the axe in our American forests are ultimately used in one form or another. The remaining 60 per cent is waste in the form of stumps, tops, branches and defective logs left in the woods, and in the form of slabs, edgings, saw dust, and other mill waste so common in all of our large saw mills. Obviously, a large part of this waste is unavoidable; it does not pay to put it on the market. Contrasted to these figures, it is estimated that, in Germany, they utilize from 94 to 96 per cent of not only the trees that are felled, but of all the wood that is grown in the forests.

The initial impression given in a visit to Germany to study their forest practice is that their forest management is so much more in advance of our own. Forestry is everywhere and is always under an intensive scheme of management. In this country we go out to our National Forests in the west or to certain forest regions, such as the Adirondacks, Lake States, Southern Appalachians or Southern Pineries to show what is or can be done in the way of real forestry. In Germany forestry can be seen practically everywhere, and is not limited or confined to such regions as the Black Forest, the Thuringian Mountains or the Saxon up-lands. The line of demarcation between agricultural and forest soils is drawn very closely in Germany, and every bit of land is put to its highest economic and productive use. There is no so-called waste land, of which we have so much in this country. Some of the oldest settled States here contain between 10 and 35 per cent of these waste
lands, many of which are often included within farms and are absolutely unproductive in their present condition.

Even on the barren, sandy plains of Prussia they are making excellent profits by planting Scotch pine and nurturing it with an under-story of beech. In the last decade, the average annual cut per acre in Prussia was over 600 feet, board measure. One can hardly travel a mile without seeing beautifully kept forests, usually in straight planted rows. There is no burned or dead standing timber which is so common in all of our forest regions. Whenever an insect attack breaks out, every precaution is taken to check it and prevent further spread or damage. Whenever a fire starts from any cause, it is considered a matter of public concern to put the fire out, and in some places the town bell is rung and everyone rushes out to fight the fire.

The second impression is the comparatively small number of species that enter into German forestry practice as compared with the great number of available and suitable native species in this country. Practically their whole system of forestry depends upon four or five species, such as Scotch pine, Norway spruce, European beech, Silver fir, and oak. To be sure, there are a great number of others, such as larch, ash, willow, alder, etc., but they are unimportant as compared with the principal ones. Contrasted with this situation, there are at least 40 or 50 species that will be available and valuable for future management in this country. Some of our best American trees, such as white pine, Douglas fir, and red oak, have already been introduced into Germany and used with considerable success. Redwood, white ash, black locust, yellow poplar and western yellow pine are also being used.

The last and perhaps the best impression gained in studying German forestry is the closeness with which they utilize the products of the forest. The study of this very important phase of forestry was especially interesting; and opportunities to observe typical examples of extensive utilization were not confined to a few places scattered here and there, but could be found in almost every part of Germany.

This close utilization is made possible by the following conditions:

1. Comparatively high prices obtained for all kinds of for-
est products. It is simply a case of the old economic law of supply and demand. Timber has become so scarce and consequently so valuable that it commands very attractive prices, and, in fact, is still rising so rapidly that wherever a substitute can be introduced to advantage it has been used. In this respect we are now passing through the same economic evolution in our national development that Germany passed through probably 200 years ago, and, in all likelihood, we will rapidly approach this condition and solve the problems in the same general way that Germany has done in the utilization of the products of the forest. In visiting practically every region of Germany, the writer did not see a single modern house of any proportions made out of wood. Concrete, brick and stone are used almost entirely for buildings. Even the roofs are covered with tiling. On the other hand, the German railroads have attempted to use iron ties in place of wooden ones, but it has been determined that they will not stand the heavy pressure of traffic and easily corrode in the damp climate, so that they are reverting to the use of creosoted ties entirely.

2. The excellent markets for all kinds of wood products. This is obviously closely associated with the above. Germany is one of the most densely populated nations in the world, and there is not a single part of the tree which cannot be utilized to profitable advantage. Although there is not such a great demand for construction and general finishing timbers as in this country, most of their larger wood products go into interior finish, flooring, ties, furniture, cooperage, sash and doors, and a great variety of small materials.

3. Cheap labor. The cost of labor is a very important item in securing close utilization of forest products. Labor is so high in this country that, up to the present time together with the comparatively low prices obtained for wood products, only the best material could be marketed and utilized to advantage. For instance, men in Germany are willing to work for 75 cents to $1 per day in the same character of employment that men in this country would expect from $1.50 to $2.25 per day for.

4. National spirit of economy and conservation. To this fact may be attributed a considerable amount of the closeness with which Germany can utilize the products of her forests. The German is inherently and by training a frugal, careful,
saving individual and bears out a strong contrast to the American spirit of prodigal waste.

Most of the logging operations are small when compared to what we consider an ordinary lumbering operation in this country. Most of the woods work is done by oxen and horses, along with manual labor, and they do not have or use all of the many labor-saving devices that are so common in connection with logging and saw mill practice in this country. Long timbers of tree lengths are very commonly sawed in the woods. They are hauled in this size to the mill which makes permissible economy both in transportation and in the cutting up of the stem at the mill into the desired lengths suited for the market. After the main bole is cut, the smaller branches are gathered together into fagots, the larger branches into fuel wood, and everything is sold at a profit. Even the stumps are grubbed out and sold for fuel. In some cases, stumps are sold to wood distillation plants for the production of charcoal, tar, wood alcohol, acetates, etc. Norway spruce logs are usually barked in the woods, and the bark, after being seasoned in piles, is used for tanning purposes.

In the mill, which is usually one corresponding to a capacity of from 20,000 to 50,000 board feet per day, the gang saw is almost universally in use. They saw "through and through" with a resultant minimum loss in the form of saw dust, slabs, edgings, etc. Wherever any small pieces cannot be utilized for any other purpose they are sold for fuel which commands attractive prices in every part of Germany.

In connection with a great many of the state and municipal forests a permanent saw mill is stationed to manufacture the products of the forest. Some of these mills are very remarkable in the great variety of manufactured products they can turn out. For example, one mill, besides the ordinary type of lumber and timber that is turned out in a saw mill, had special machines for the manufacture of broom handles, wooden ware, furniture stock, cooperage, handles, implements, etc. Saw mills are regarded as permanent manufacturing establishments in contrast to those in this country which are dismantled as soon as a tract is cut over. In Germany there is a sustained annual or periodic yield which only removes the growth of the forest,
Even the branches lopped off by natural pruning are gathered together and sold as faggot wood.

Logs graded as to size and quality in the Black Forest. Swelled butts show how stumps are cut in the German Forest.
Norway spruce, managed on a 100-year rotation, in Germany.

A logging railroad, maintained on a permanent basis to haul out all classes of forest products.
so that the sawmill is on a permanent basis and is run the year around or at least a part of each year.

In the same way, all improvements made in the forest to facilitate the transportation of the logs to the mill, such as logging railroads, log chutes, haul roads, splash dams, and other stream improvements, are maintained on a permanent basis. In this way, therefore, the overhead and depreciation charges are not so burdensome. Driving is still commonly practiced in the mountainous regions, and all the facilities along the streams are constructed and maintained in a remarkably thorough and efficient manner.

Wood preservation plays an important part in wood utilization in Germany. In conformity with their national spirit of economy, a common practice is to put all inferior or perishable woods through a preservative treatment whenever they are placed in any way that will expose them to the liability of decay. This holds true especially for ties, bridge timbers, etc.

Contrasted to our two principal tie woods, oak and southern pine, which make up 50 per cent of all the ties used in this country, and are distinguished for their durability, hardness and strength, the principal tie woods in Germany are Scotch pine and beech, which are very inferior in these qualities. These are always treated before being placed in the tracks. It is said that Scotch pine will only last from 7 to 8 years without treatment but 17 years with treatment. Beech, untreated, must be replaced in 5 to 6 years, whereas it will last 20 years when treated. This is based on creosoting by the Ruping process. The treatment with Scotch pine costs 21 cents per tie, but penetration of only the sapwood is secured. With beech, it costs about 48 cents per tie, but there is absolute and complete penetration of both heart and sapwood. Scotch pine may prove to be an important source of future tie material in this country.

From the above mentioned impressions of utilization in "the Fatherland", it is apparent that their whole system of forestry is largely dependent upon the prices they can secure for their products. That is, they can practice intensive methods of silviculture, simply because it pays. To substantiate this statement we find that those states and municipalities that have expended the largest amount of money in growing and maintaining their
forests in the highest productive condition, have received the largest returns as a result of that investment.

The following is a concrete example of the close utilization. On one forest, where Norway spruce was managed on a 100 year rotation under a clear cutting system, all the trees were first "barked", and then were cut into lengths of approximately 23 feet and graded according to size, clearness, straightness and freedom from defects. The larger tops were cut into ties and mine props; the smaller used for paper pulp. Then the stumps were grubbed out, and all the branches and even the twigs were graded according to size and sold for fuel wood. After this there was nothing but the bare earth left. The area was planted the following spring and another compartment was cut over.