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FORESTS AND EMPLOYMENT  
IN GERMANY

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## FOREWORD

In the United States, much thought is being given to the relation of sustained-yield forestry to employment and the support of permanent communities. It is of interest, therefore, to know something about the way in which the forests provide rural employment and thus supplement agriculture in countries where forestry has been widely practiced for a long time. Germany is one of those countries. There, the use of most of the land has become fairly well stabilized. More than one-fourth of the land surface is covered with forest, and a large part of the forest area has been under relatively intensive management for well over a hundred years.

This study was undertaken for the purpose of learning the extent to which the German forests afford work opportunities, particularly for rural people. It must be recognized from the start that political and social institutions and economic conditions in Germany are very unlike those in this country. Any form of sustained-yield forest management which may be developed in this country, therefore, must spring from our own economic conditions and political and social traditions. In working out methods and policies adapted to our own conditions, however, it is helpful to know what has happened elsewhere.

One fact, borne out by long experience not only in Germany but also in other countries with quite different institutions and philosophies, is that managed forests do provide a large and reasonably steady volume of work, and thereby contribute immeasurably toward the existence and welfare of permanent agriculture and settled rural populations. There is every reason to suppose that the general adoption of sustained-yield forest management in this country will have similar results.

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## INTRODUCTION

Work in the woods, the sawmills, and the wood-working industries has engaged the energies of large numbers of our people ever since North America was settled. In most parts of the country, forest work has been of a more or less transitory nature. Rapid development and bustling activity of forest industries were followed, sooner or later, by equally rapid decline. In districts without good agricultural land or other natural resources, depletion of the timber was followed by loss of opportunities for profitable employment. The workers then had to move on to new regions, or were left stranded, to eke out a precarious existence. Villages and cities grew up, flourished for a brief period, and finally disappeared.

In central Europe, and particularly in Germany, forests managed on a sustained-yield basis have constituted a major source of livelihood for permanent communities through many generations. This function of forests in supporting a settled, well-distributed population has come to be recognized there as a major objective in forest

<sup>1</sup> Special acknowledgement is due the Oberlaender Trust of the Carl Schurz Memorial Foundation, which made possible the study of some of the matters covered in this circular with respect to Central Europe.

policy. It is given at least as much weight as the objective of supplying the national timber requirements and the protection of soil and water.

This study was undertaken in the belief that an examination of the extent and conditions of employment in the managed forests of central Europe would be of interest to the people of the United States. Here, as in Europe, provision of useful employment for rural people is bound to receive more and more attention in planning programs of forest development. A few geographic facts will help to explain why this function of the forests is so important in Germany.

Germany has a land area slightly smaller than that of Michigan, Wisconsin, and Minnesota. It lies considerably farther north, however. Munich, near the extreme southern part, is in about the same latitude as Duluth; the northern part of East Prussia is as far north as Ketchikan, Alaska, or northern Labrador. The mean annual temperatures (40° to 50° F.) are not greatly different from those in our Lake States, but the German winters average somewhat warmer (except in East Prussia) and the summers are a little cooler. The annual rainfall has about the same range (16 to 35 inches) as in the Lake States, except for a few localities of heavier precipitation at high altitudes in Germany, and the distribution through the year is similar. The soils of Germany are naturally no more fertile, on the average, but probably less so, than those of the Lake States. Like the Lake States, Germany has large areas of sand plains and moors.

There are in Michigan, Wisconsin, and Minnesota 600,000 farms, with an arable area (cropland and improved pasture) of approximately 47,000,000 acres. Germany has 5,100,000 farms,<sup>2</sup> with about 67,000,000 acres of arable land (plow land and meadows). The three Lake States have about 51,000,000 acres of forest land; Germany has less than 32,000,000, or not quite as much as Michigan and Wisconsin. The annual cut of all classes of timber in the Lake States averaged about 1,250,000,000 cubic feet for the period 1925-29, while in Germany the average cut for the same period was about 1,750,000,000 cubic feet. The Lake States' cut was approximately twice the increment; in Germany, cut and increment about balanced each other.

Germany's population is close to seven times that of the Lake States. For these States to be settled as densely as Germany it would be necessary to crowd into them, in addition to the people already there, the entire population of the other States north of the Ohio and Potomac Rivers and east of the Mississippi, plus Virginia, West Virginia, Kentucky, and Iowa. It is evident that Germany must use her land resources to the utmost in order to support her people.

Intensive use of the land, therefore, has been and inevitably must continue to be a fundamental objective of the German national policy, whatever may be the form or the political control of the Government. This objective has been considerably emphasized by the post-war trend toward economic autarchy which has developed in Germany just as it has in many other countries. Closely related to this basic objective, and growing partly out of it, are the national agricultural and population policies. These policies are not new, but they have received a new impetus during the last few years. One aim is to bring about a better distribution of population by checking the heavy movement

<sup>2</sup> The figures are not exactly comparable, because the United States census omits farms under 3 acres unless they produce crops worth \$250 or more.

from rural districts into the cities and by establishing more people in the less densely populated districts, especially near the frontiers. Another aim is to maintain a stable rural population of small farmers and industrial workers attached, through ownership, to the land. In attaining these objectives it is obvious that the forest land, comprising more than one-fourth of the land area and mostly submarginal for agriculture, must do its part.

In presenting the results of the study, the aim has been to state the facts objectively, without venturing to pass judgment on the desirability of the past or present social and political institutions. Employment in the public forests has been emphasized, for several reasons. First, employment statistics are available only for the public forests. Secondly, more than half of the German forest is in public ownership of one form or another. More than half of the remainder is in small woodlots operated mostly by the owners and their families, and less than one-sixth is in privately owned tracts larger than 500 hectares (1,235 acres). In the third place, the public forests more or less set the standard for the larger sustained-yield forests in private ownership.

#### VOLUME OF EMPLOYMENT IN GERMAN FORESTS<sup>3</sup>

Perhaps the best indication of the number of people supported in whole or in part by the forest resource is the number employed in producing, tending, and harvesting the forest crop and in processing forest products. In Germany and in neighboring portions of central Europe the aggregate numbers thus employed are surprisingly large, judged by American standards. The State forests of Prussia, for instance, with an area of a little more than 6,000,000 acres, gave direct employment to 147,000 workers in the peak year (1926). This was in woods work alone; it did not include teamsters and others engaged in hauling timber from the forests, nor the forest officers, of whom there were about 4,500.

One reason for the large numbers employed is the highly intensive forest management and utilization which characterize much of central European forestry. Another reason is the prevalence of hand work in practically all phases of forestry operations. The major reason, however, is the fact that by far the majority of all forest workers are employed in the woods for only a part of the year. The women and children, who are employed in large numbers for a few weeks during the spring and fall planting seasons, may or may not have other employment beyond their ordinary farm and household duties. A few women are employed for longer periods in forest nurseries and in certain cultural operations. Most of the men work for part of the year on their farms or in local industries. In normal times relatively few come from the more distant cities. The period of greatest activity in most forests is winter and early spring, when farm work and employment in local building trades and other industries are slack. Woods work constitutes, in this respect, almost an ideal part-time occupation for farmers and their teams and for village artisans. Nearly all of the regular, so-called full-time forest workers work on their farms at least during the harvest.

The German forests, therefore, not only support a large number of

<sup>3</sup> A brief summary of comparable conditions in Austria is given in the appendix, p. 51.

independent industrial enterprises and the workers engaged therein, but they contribute in many ways toward the stabilization of agricultural enterprises and the farm population. The combination of agriculture and forestry enables many parts of the country to support many more people than could the farm land alone.

#### CLASSIFICATION OF FOREST WORKERS

Workers are commonly classified as permanent or regular employees (ständige Arbeiter or Stamarbeiter) and occasional or casual workers (unständige or Gelegenheitsarbeiter). The regular workers include those who work practically all the year, with forestry as their principal occupation, and seasonal (halbständige) workers whose main occupation is agriculture or industry, but who work in the forests year after year, generally in the fall and winter. In some parts of Prussia, workers who are available for work at any time when called or who live in forest houses are classed as permanent employees even though they may not work in the forests most of the year. In Bavaria, those who work at least 200 days a year are so classified; in Baden the line is drawn at 150 days; and in Württemberg at 100 days. In Brunswick only those who work practically throughout the year are classed as ständig, but those employed for 60 days or more year after year are considered regular workers.

Complete statistics on employment in German forests are lacking. There are fairly detailed figures, however, for the State forests in several of the larger States, among them Prussia, Bavaria, Württemberg, and Brunswick.

#### EMPLOYMENT IN THE STATE FORESTS OF PRUSSIA

The State forests of Prussia (24)<sup>4</sup> embraced an area of approximately 6,200,000 acres on March 31, 1935, or 300,000 acres more than in 1925. The timber-producing area ("forest soil") was about 5,300,000 acres in 1925 and about 5,600,000 acres in 1935. The total annual timber cut during the 10-year period averaged 390,000,000 cubic feet. The average area planted annually was 66,000 acres; the area seeded, 39,500 acres. The numbers of laborers employed and the average duration of employment are shown in table 1.

The figures in table 1 correspond closely to those for pre-war years. In 1908 there were 173,600 workers, but the area of State forests was considerably larger. The average number of days worked was 60, and total employment aggregated 1.6 days per acre of timber area (29).

#### EMPLOYMENT IN THE STATE FORESTS OF BAVARIA

The Bavarian State forests (5) embraced a total area of 2,304,000 acres at the beginning of 1924, and 2,343,000 acres at the end of 1933. The net timber area was 241,000 and 245,000 acres, respectively, less than the total area. The annual cut from 1924 to 1933 averaged approximately 147,000,000 cubic feet. About 3,300 acres a year was sown and about 21,000 acres was planted. Table 2 shows the volume of employment during the period 1924-33, and the numbers of persons employed in 1925 and 1931, the only years within this period for which such figures are reported.

<sup>4</sup> Numbers in italics refer to Literature Cited, p. 45.



TABLE 1.—*Employment of forest workers in the State forests of Prussia, 1926-34*

Year and type of labor	Number employed			Average number of days employed			Aggregate employment		
	Males	Fe- males	All workers	Males	Fe- males	All workers	Total number of days	Days per acre of—	
								Gross area	Timber area
	Thou- sands	Thou- sands	Thou- sands				Thou- sands		
1926.....	85.9	61.2	147.1	94	28	67	9,817	1.64	1.83
1927.....	83.2	60.4	143.6	98	29	67	9,867	1.62	1.81
1928.....	76.1	58.4	134.5	101	28	69	9,321	1.54	1.71
1929.....	73.9	60.0	133.9	98	27	66	8,816	1.45	1.61
1930.....	71.6	58.1	129.7	95	26	64	8,297	1.36	1.51
1931.....	70.0	56.6	126.6	86	23	58	7,343	1.20	1.33
1932:									
Ordinary laborers.....	70.2	44.1	114.3	70	14	48	5,563	.91	1.01
Labor service enrollees..	17.2	-----	17.2	52	-----	52	895	.14	.16
1933:									
Ordinary laborers.....	92.9	45.4	138.3	73	18	54	7,589	1.23	1.36
Labor service enrollees..	21.1	-----	21.1	75	-----	75	1,585	.26	.29
1934:									
Ordinary laborers.....	99.2	43.6	142.8	84	21	64	9,207	1.49	1.65
Labor service enrollees..	11.3	-----	11.3	91	-----	91	1,035	.17	.19
Average.....	85.8	54.2	140.0	87	24	63	8,814	1.45	1.61

TABLE 2.—*Employment of forest workers in the State forests of Bavaria, 1924-33*<sup>1</sup>

Year	Number employed				Aggregate employ- ment	
	Men	Women	Children under 16	Total	Total days	Days per acre of timber area
1924.....					Thousands	
1925.....	36,576	18,725	6,442	2 61,743	4,134	2.00
1926.....	-----	-----	-----	-----	5,019	2.43
1927.....	-----	-----	-----	-----	4,716	2.28
1929.....	-----	-----	-----	-----	4,612	2.22
1930.....	-----	-----	-----	-----	4,403	2.11
1931.....	17,230	17,206	2,283	2 36,719	3,725	1.79
1932.....	-----	-----	-----	-----	2,909	1.40
1933.....	-----	-----	-----	-----	2,187	1.05
Average.....	-----	-----	-----	-----	3,562	1.70
Average.....	-----	-----	-----	-----	3,919	1.89

<sup>1</sup> Figures for 1928 were not obtained.<sup>2</sup> Average number of days employed (all workers) was 81 in 1925 and 79 in 1931.<sup>3</sup> Includes 2,240,000 days of regular work and 1,322,000 days of emergency work to relieve unemployment

## EMPLOYMENT IN THE STATE FORESTS OF WURTTENBERG

During the 8 years 1925-32 the area of State forests in Wurttemberg (41) increased very little; it averaged slightly more than 500,000 acres. All but about 34,000 acres was timber-producing land. The average annual cut during the period was 40,700,000 cubic feet. The area planted annually averaged a little less than 5,000 acres. The volume of work and numbers of laborers are shown in table 3.

TABLE 3.—*Employment of forest workers in the State forests of Wurttemberg, 1925-32*

Year	Number employed			Average number of days employed			Aggregate employment	
	Males	Females	All workers	Males	Females	All workers	Total number of days	Days per acre of timber area
1925.....	12,311	7,702	20,013	91	31	68	<i>Thousands</i> 1,356	2.91
1926.....	12,617	8,788	21,405	98	29	70	1,486	3.19
1927.....	12,992	8,258	21,250	87	32	66	1,393	2.99
1928.....	12,081	7,858	19,939	92	33	69	1,368	2.94
1929.....	12,123	7,820	19,943	92	30	68	1,348	2.89
1930.....	12,230	7,942	20,172	92	37	70	1,419	3.04
1931.....	12,771	7,719	20,490	80	24	59	1,207	2.59
1932.....	11,946	6,998	18,944	62	20	47	886	1.90
Average.....	12,384	7,886	20,270	87	30	65	1,308	2.81

## EMPLOYMENT IN THE STATE FORESTS OF BRUNSWICK

In Brunswick (7) the total area of State forests was about 186,300 acres in 1928 and 187,000 acres in 1933. Approximately 94 percent was forest land. The annual cut during the 6 years ended in 1933 averaged 11,860,000 cubic feet. The total number of workers and the average number of days' work performed in a year are shown in table 4.

TABLE 4.—*Employment of forest workers in the State forests of Brunswick, 1928-33*

Year	Number employed			Average number of days employed			Aggregate employment	
	Males	Females	All workers	Males	Females	All workers	Total number of days	Days per acre of timber area
1928.....	2,532	1,346	3,878	-----	-----	97	<i>Thousands</i> 377	2.15
1929.....	2,054	1,333	3,387	-----	-----	102	346	1.97
1930.....	1,757	1,234	2,991	-----	-----	97	290	1.65
1931.....	1,616	1,386	3,002	116	27	75	225	1.28
1932.....	1,581	1,330	2,911	105	24	68	197	1.12
1933.....	1,955	1,230	3,185	123	26	86	273	1.56
Average.....	1,916	1,310	3,226	115	26	88	285	1.62

<sup>1</sup> Average for 1931-33.

## WORK VOLUME AND INTENSITY OF FOREST MANAGEMENT

Increasing intensity of forest management not only tends to increase timber yields but also requires more work. Dieterich (11) points out the need for and possibility of increasing employment opportunities in certain regions where permanent settlement depends in part on work off the farms. In the Bavarian Forest of eastern Bavaria, for instance, he estimates that the 250,000 acres of farm woods could give 500,000 to 600,000 more days of employment than they do now if they were handled like the State forests. As it is, litter raking, grazing, and overcutting have reduced their growing stock so that only 19 percent of the spruce is over 60 years old, as against 47 percent

in the State forests. The operation of the State forests of this section gives two and one-half times as much employment and yields about two and one-half times as much timber per hectare as in the State forests of the Upper Palatinate, which have been impoverished by centuries of litter removal.

The wide difference between 1.61 days' work per acre in Prussia and 2.81 days' in Wurttemberg, shown in tables 1 and 3, is partly the result of differences in character of the forests and in intensity of management. A major portion of the work is in logging and in construction and upkeep of roads. Other things being equal, the volume of work in logging; and to some extent in road building and maintenance, tends to vary with the volume of timber cut. The annual cut in the State forests of Wurttemberg averaged 81 cubic feet per acre; in the other three States, 64 to 72 cubic feet. When related to volume of timber cut, the differences in work volume are less striking than when related to area, as shown in table 5.

TABLE 5.—Differences in work volume, as between 4 German States, in terms of timber area and of volume cut

State	Volume of work		State	Volume of work	
	Per acre	Per M cubic feet		Per acre	Per M cubic feet
	Days	Days		Days	Days
Prussia.....	1.6	22.6	Bavaria.....	1.9	26.7
Brunswick.....	1.6	24.0	Wurttemberg.....	2.8	32.1

More or less fragmentary data on employment were collected in several forests that were visited in 1935. These included State, communal, and private forests scattered from the southwestern to the northeastern parts of the country. The composite data for eight forests consisting chiefly of pine and eight that are mostly spruce are shown in table 6.

TABLE 6.—Employment in 8 pine and in 8 spruce forests in various parts of Germany

Item	Pine forests	Spruce forests
Wooded area..... acres.....	114,000	65,500
Annual cut..... cubic feet.....	6,000,000	6,600,000
Workers:		
Permanent..... number.....	530	760
Temporary..... do.....	720	680
Total..... do.....	1,250	1,440
Full-time equivalent..... do.....	775	860
Work per year <sup>1</sup> ..... days.....	193,750	215,000
Per acre..... do.....	1.7	3.3
Per 1,000 cubic feet cut..... do.....	32.3	32.6

<sup>1</sup> Estimated on basis of 250 days' employment for a full-time worker.

It will be noted that in these cases, at least, the amount of employment tends to vary with the volume of timber cut rather than with area. This is to be expected, for logging and cultural measures constitute a large proportion of forest work.

In general, sustained-yield forestry means more work and steadier work than intermittent exploitation. Temporarily, there may be a large volume of work in exploiting the timber crop and in restocking the cut-over land, but then follows a long period with relatively little work until the next crop is ready to cut. Such intermittent operation is no longer practiced on a large scale in Germany except when necessitated by natural calamities such as insect epidemics or severe windthrow or ice storms. Extensive insect defoliation in eastern Germany in recent years has in some instances required importation of workers from other sections to cut the dead timber and replant the denuded areas. Afterward, the local workers, who had always earned part of their living in the forests, were left without prospect of forest employment for many years (35).

Mixed forests tend to offer more employment opportunities and a greater variety of work than pure forests of pine or spruce. They yield a wider variety of products, and more intensive cultural operations are sometimes required to establish and maintain the desired mixtures.

#### KINDS OF FOREST WORK

It may be of some interest to consider what kinds of jobs are performed in the German forests. The statistics for the Bavarian State forests (5) show how the work is distributed among the principal lines of activity. Roughly half of the total employment is in timber cutting and skidding. Planting and other cultural work come next, and road construction is also an important item (table 7).

TABLE 7.—*Employment in Bavarian State forests, by main activities, 1913, 1920, and 1929-33*

Activity	1913	1920 <sup>1</sup>	1929	1930	1931	1932	1933	
							Regu- lar	Emer- gency
	<i>1,000 days</i>	<i>1,000 days</i>	<i>1,000 days</i>	<i>1,000 days</i>	<i>1,000 days</i>	<i>1,000 days</i>	<i>1,000 days</i>	<i>1,000 days</i>
Logging.....	2,410	3,955	2,200	2,012	1,538	1,520	1,674	.....
Planting and cultural operations.....	1,187	815	1,024	720	584	240	154	510
Road construction.....	727	1,183	662	601	336	186	141	810
Other.....	263	947	517	492	451	241	271	2
Total.....	4,587	6,900	4,403	3,725	2,909	2,187	2,240	1,322
Total per acre of forest.....	<i>Days 2.2</i>	<i>Days 3.3</i>	<i>Days 2.1</i>	<i>Days 1.8</i>	<i>Days 1.4</i>	<i>Days 1.0</i>	<i>Days 1.1</i>	<i>Days 0.6</i>

<sup>1</sup> A large amount of emergency work to relieve unemployment was done in 1920.

Each of these main lines of activity embraces numerous kinds of jobs. Many of these, of course, are similar to work done in American forests; others are practically or entirely unknown in American forestry, either because such measures are not called for under American conditions or because they involve refinements not yet economically justifiable in this country. A partial list of the jobs performed by German forest workers includes the following:

**Logging:**

- Timber felling, bucking, and limbing.
- Skidding to roadside.
- Peeling logs, pulpwood, mine timbers, etc.
- Splitting firewood bolts.
- Piling bolts.
- Working up tops and limbs; bundling faggots.

**Reforestation and afforestation:**

- Seed collection and extraction.
- Construction and operation of forest nurseries.
- Preparation of planting sites:
  - Removal of heather, sod, and raw humus, by plowing under, "scalping," or otherwise.
  - Removal of stumps.
  - Fertilizing with lime, basic slag, etc.
  - Growing nitrogen-fixing cover crops (lupine, broom, etc.).

Field planting—generally two to four times as many trees to the acre as in American practice.

Field sowing.

Replanting, i. e., replacing trees that die. This is generally repeated until full stocking is assured.

Underplanting and interplanting to develop mixed stands.

Cultural operations to insure establishment of the stand:

- Cultivation of the soil.
- Weeding and cutting grass and brush.
- Release cuttings.
- Thinning out surplus sprouts.

Protective measures, especially against deer, rabbits, and other game:

- Fencing.
- Surrounding saplings with dry brush or wire.
- Attaching paper or metal protectors on terminal buds.
- Tarring buds.
- Spraying to control fungi (leaf-cast, etc.).
- Collection of May beetles.
- Control of weevils.

**Cultural operations:**

- Thinning: usually begins early (twentieth to thirtieth year in conifer stands) and is repeated at short intervals (3 to 5 years) in well-managed forests.
- Pruning, especially dry pruning. The tendency is to do much more of this than in the past.
- Sanitation and improvement cuttings.

**Forest protection:**

- Banding trees with tar, etc., to control insects; this is done on a large scale.
- Propagation and fencing of anthills for insect control.
- Construction and distribution of bird houses and nest boxes.
- Setting boundary posts and construction of boundary ditches.
- Fire control—a relatively minor activity in many parts of Germany.
- Construction of firebreaks.
- Dusting of insect poisons from the air or the ground; not done extensively, and, of course, a job only for experts.
- Tying bundles of twigs around tree trunks to prevent damage by deer.

**Game management:**

- Cultivation of feed patches.
- Fencing to keep game in or out of certain areas.
- Construction and operation of feeding stations.
- Construction of shooting stands.
- Game drives.
- Collection of acorns, cutting grass, etc., for winter game feed.

**Construction and maintenance of improvements:**

- Roads.
- Log chutes.
- Drainage ditches.
- Bridges and culverts.
- Houses and administrative buildings.
- Lookout towers.
- Telephone lines.

Erosion and avalanche control, by terracing, barriers, check-dams, stabilizing stream beds and banks, revegetation, etc.

Fixation of dunes.

Land reclamation and clearing for agricultural use.<sup>5</sup>

Pasture improvement—removal of stumps and rocks, revegetation, drainage, or irrigation.

Miscellaneous:

Extraction of resin from spruce and pine.

Gathering of tanbark.

Gathering of berries, nuts, and mushrooms (ordinarily by the users, not by hired employees of the forest owner).

#### LABOR IN FOREST PLANTING

During the 6 years 1928 to 1933 there was sown and planted in the Bavarian State forests 135,000 acres, at a total cost of more than \$5,700,000 or approximately \$42 an acre. This seems high compared with American standards, but it includes not merely the cost of seed and plants and of the actual field planting or sowing, but also the cost of preparing and draining the planting sites (roughly \$6 an acre), the cost of protecting the plantations (chiefly fencing against game, about \$4.80 an acre), and cultural measures subsequent to planting (weeding, release cutting, etc., about \$3 an acre). Instead of the 900 to 1,200 trees per acre that are usually planted in the United States, it is customary to plant 2,500 to 4,000 or more. Even allowing for all of these differences, the planting costs are higher than ours, when the lower wage rates of German workers are considered. (The average wage was about \$0.85 a day for planting work during the period; it was mostly done by women and children.) Probably the average German worker plants fewer trees in a day than the average American. Setting of 20 to 30 trees an hour in prepared spots or furrows is considered a fair average for women workers. This does not include preparation of the spots or furrows.

During the same 6 years slightly more than 380,000 acres was stocked artificially in the Prussian State forests (24), at a total cost of more than \$17,000,000 and an average of approximately \$45 an acre. Of this, the cost of seed and plants and the cost of planting and sowing, including replacements, amounted to \$26.

#### LABOR IN LOGGING

The quantity of work required for logging varies widely, of course, depending on the character of the timber and the topography. The output per man-day in Austria and Germany ranges mostly between 1½ and 3 cubic meters, or about 50 to 100 cubic feet of round timber. This includes skidding to the roadside, but not hauling to the mill or shipping point.

Logging is a seasonal occupation in most districts. In the low country it is commonly carried on in the late fall and winter, but in the high mountain districts of Bavaria and Austria felling is usually done in the summer and fall, so that the logs can be got out before the snow becomes too deep. In some places operations are yearlong. This has been the case in East Prussia where extensive insect defoliations have necessitated heavy emergency cutting. It is worth noting that practically all trees killed by fire, disease, or insects, thrown by the wind, or broken by ice storms are promptly logged instead of

<sup>5</sup> Practically all of the State and large private forests include some agricultural land, which is leased to forest officers and workers, or even to outsiders. In some instances, the need for more cropland is leading to the clearing of small areas of forest on good soils.

being left to rot in the woods. This means that all of the timber that grows is utilized and creates employment opportunities.

Except in some of the small farm woods, where timber is sold on the stump, logging is almost always done by employees of the forest owner, whether private or public. In Austria some timber in the State forests is sold on the stump and logged by the purchaser. Unlike the United States, relatively few forests in central Europe are owned by sawmill operators or by wood-using industries, so the logging industry and the lumber industry are quite distinct. Of 823,136 forest units of less than 247 acres each in Germany in 1925, only about 900, or slightly more than 0.1 percent, were connected with sawmills and 80, or less than 0.01 percent, with pulp mills. Of 10,491 units of 248 to 2,470 acres each, about 180 (1.8 percent) were owned by sawmill owners and 4 (0.04 percent) by pulp mills. Of the forests larger than 2,470 acres, about 3 percent were connected with sawmills and only one forest with a pulp plant (32).

In the lowland forests the owners' employees generally haul the firewood, pulpwood, mine timbers, and other small material to the roadside and stack it there. The larger logs are generally left in the woods for the purchaser to take out, unless it is necessary to remove them in order to plant the area or do other cultural work. Only when the local markets are slow or lacking does the seller haul the timber to the railroad or other shipping point, except in case of unusually large operations resulting from insect depredation or other calamity. In the mountains, special facilities are often required for getting out timber, so this is commonly done by the forest employees. In the Bavarian Alps, for example, logs are usually taken out to the valley bottoms and sold there.

In most parts of Germany the timber is hauled out by wagons or trucks, hence good roads are exceedingly important if good prices are to be received. The work-relief programs of the last few years have been going in for a great deal of road construction and improvement, including straightening, widening, reducing grades and surfacing, and strengthening of bridges.

#### PERIODS OF EMPLOYMENT

For a few States, figures have been compiled in some detail showing the number of days a year that various classes of workers are employed. Table 8 shows the number of workers in the Prussian State forests in 1924, classified according to the number of days they worked. Of the 128,000 persons employed, approximately 16,000 were classed as permanent (*ständig*) and 45,000 as regular (*regelmässig*) workers.

TABLE 8.—Percent distribution of laborers in the State forests of Prussia in 1924, according to number of days employed <sup>1</sup>

Class of laborer	250+ days	201-250 days	151-200 days	101-150 days	51-100 days	26-50 days	0-25 days	Labor- ers em- ployed	Aver- age period em- ployed
	Percent	Percent	Percent	Percent	Percent	Percent	Percent		Number
Men.....	4.8	7.8	10.0	20.7	29.3	12.2	15.2	75,800	97
Women.....					8.9	23.7	67.4	45,700	24
Children under 16 .....						19.2	80.8	6,700	21

<sup>1</sup> Based on Treitschke (38).

Table 9 gives similar information for Bavaria, for 1908, 1925, and 1931. The decrease in employment of children is especially striking. There is also a marked tendency for the proportion of permanent and semipermanent adult male workers to increase, although they have decreased in number as a result of decline in total volume of employment, especially since 1925. The number and percentage distribution of women workers remained fairly constant during the period.

TABLE 9.—*Percent distribution of laborers in the State forests of Bavaria, according to number of days employed*<sup>1</sup>

Class of worker	Year	Permanent workers		Semipermanent workers		Occasional workers		Laborers employed
		251-300 days	200-250 days	150-199 days	100-149 days	50-99 days	0-50 days	
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Number</i>
Men.....	1908	2.8	6.6	10.5	14.6	27.2	38.3	43,100
	1925	10.1	9.6	9.5	12.3	23.8	34.7	36,600
	1931	5.9	11.4	17.7	19.7	12.4	32.9	17,200
Women.....	1908	0	.2	.8	3.5	15.4	80.1	17,700
	1925	.1	.3	1.4	4.6	19.9	73.7	18,700
	1931	0	0	.5	2.5	11.2	86.3	17,200
Children under 16 <sup>2</sup> .....	1908	.3	.2	.9	3.0	9.0	86.6	13,900
	1925	.3	.1	.7	2.4	8.8	87.7	6,400
	1931	0	.1	.2	.8	6.0	92.9	2,300

<sup>1</sup> Based on official reports (5).

<sup>2</sup> Children employed 100 days or more in 1931 were mostly boys, but about 60 percent of those employed less than 50 days were girls.

Periods of employment of workers in the State forests of Brunswick are given in table 10.

TABLE 10.—*Percent distribution of laborers in the State forests of Brunswick according to the number of days employed*<sup>1</sup>

Class of worker	Year	Permanent and regular workers					Temporary workers		Laborers employed
		180+ days	141-180 days	101-140 days	61-100 days	0-60 days	All periods	Average employment	
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Days</i>	<i>Number</i>
Males.....	1931	28.1	19.9	20.5	17.3	5.3	8.9	30	1,616
	1932	16.3	17.1	21.6	22.9	9.6	12.5	21	1,581
	1933	34.6	12.7	12.4	7.4	3.9	29.0	36	1,935
Females.....	1931	0	1.7	1.2	1.0	.4	95.7	24	1,386
	1932	.2	1.3	1.1	.8	.8	95.8	20	1,330
	1933	.7	.2	.9	.9	.6	96.7	24	1,230

<sup>1</sup> Based on official reports (7).

### FOREST WORK LARGELY A SUPPLEMENTARY OCCUPATION

According to the 1925 census of occupations, only 131,460 persons in Germany gave forest work as their main occupation (Hauptberuf). As might be inferred from the short average term of employment of woods workers, most of them spend the greater portion of their time in other occupations. This is well illustrated by the Prussian statistics (table 11).



TABLE 11.—Percent distribution of laborers in the State forests of Prussia in 1924 according to principal occupation<sup>1</sup>

Administrative district (Regierungsbezirk)	Forest work	Small farmer	Farm labor	Industrial work	Miscellaneous unskilled	Total employed
	Percent	Percent	Percent	Percent	Percent	Number
Königsberg.....	17	13	17	9	44	6,737
Gumbinnen.....	21	22	16	3	38	6,326
Allenstein.....	19	14	19	4	44	10,348
Schneidemühl.....	16	12	18	4	50	5,309
Potsdam.....	11	10	10	14	55	9,882
Frankfurt-a.-O.....	12	15	9	8	56	9,786
Stettin.....	10	8	14	12	56	5,796
Köslin.....	20	9	15	2	54	4,514
Stralsund.....	17	4	19	10	50	1,270
Breslau-Liegnitz.....	14	13	8	11	54	7,102
Oppeln.....	10	28	6	8	48	4,784
Magdeburg.....	16	8	5	8	63	3,450
Merseburg.....	9	15	8	14	54	4,186
Erfurt.....	16	13	5	12	54	3,160
Schleswig.....	8	14	36	21	21	1,495
Hannover.....	14	27	18	9	32	3,524
Hildesheim.....	43	5	4	13	35	4,524
Lüneburg.....	16	32	9	5	38	3,249
Stade.....	17	50	14	7	12	1,268
Minden.....	24	23	5	14	34	2,049
Arnsberg.....	30	20	2	9	39	990
Kassell.....	5	32	6	17	40	15,508
Wiesbaden.....	2	39	4	20	35	5,360
Koblenz.....	4	41	7	10	38	2,246
Düsseldorf.....	17	46	15	3	19	445
Köln.....	13	4	7	12	64	634
Trier.....	10	32	3	5	50	3,149
Aachen.....	21	17	2	3	57	1,049
Total.....	14	19	11	10	46	128,140

<sup>1</sup> Based on Treitschke (38).

As these figures indicate, the number of what might be termed "professional" forest laborers is relatively low in Prussia, but varies considerably for different districts. They comprise a particularly small part of the total in the western districts of Wiesbaden, Koblenz, and Kassell, and in Schleswig. On the other hand, their numbers are relatively large in the Hildesheim, Arnsberg, and Minden districts of northwestern Prussia, and in East Prussia and Pomerania in the northeast. The percentage of farmers and farm laborers is especially high in the Stade, Schleswig, Hannover, and Lüneburg districts, all in the northwest, and in the Rhineland districts of Düsseldorf, Koblenz, and Wiesbaden. The percentage of industrial workers is low in the eastern districts, as might be expected, and also in several in the extreme western part of the country (Aachen, Trier, Düsseldorf). It is highest in Schleswig and in Wiesbaden (Rhine Valley). The high percentage of miscellaneous unskilled workers is accounted for by the inclusion in this group of the women and children, most of whom are not otherwise gainfully employed.

In certain sections of Württemberg most of the forest workers are small farmers or seasonal building workers such as carpenters and bricklayers. The shareholders in some association (Korporation) forests value the opportunity to work in the woods fully as much as their share in the net forest income. An example is the Sondernach forest, where each coowner has the right to 25 to 40 days' work a year, at RM3 a day (\$1.20).

In Bavaria, in 1908, forest work was the main occupation of only 22 percent of the male forest workers; 47 percent were small farmers, 16

percent workers in seasonal industries, and 13 percent were miscellaneous unskilled laborers (34). It was stated recently (36) that 70 percent of the work in the Bavarian forests is performed by small farmers.

#### LAND OWNERSHIP BY FOREST WORKERS

Land ownership by workers in the Bavarian State forests in 1931 is shown in table 12. These figures are for male workers over 18 years of age who were on the rolls December 31, 1931. Workers who were dependents (family members or hired men) of farm owners and who lived with them were classed with the owners. Forest regions that have fairly similar geographic and economic conditions are grouped together in the table.

TABLE 12.—Percent distribution of State forest workers in Bavaria in the various forest regions, by land ownership and residence status, Dec. 31, 1931<sup>1</sup>

Land ownership and residence status	Region A	Region B	Region C	Region D	Region E	Region F	Total workers
Occasional workers:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Local residents.....	8.5	13.0	8.1	28.3	39.5	22.7	18.5
Nonresidents.....	.2	.7	.5	0	0	2.3	.3
Total occasional.....	8.7	13.7	8.6	28.3	39.5	25.0	18.8
Permanent and semipermanent:							
Own neither house nor land.....	11.3	11.5	22.8	12.2	16.6	31.7	15.6
Own house but no farm land.....	2.9	6.7	8.3	7.5	6.0	11.9	6.9
Total nonfarmers.....	14.2	18.2	31.1	19.7	22.6	43.6	22.5
Farm owners:							
Own less than 2.5 acres of farm land.....	22.5	10.0	35.1	30.8	7.1	4.8	13.2
Own 2.5 to 8.4 acres.....	35.9	27.8	21.5	20.6	16.5	10.5	24.0
Own 8.4 to 16.8 acres.....	14.2	24.1	3.3	.6	11.7	7.7	16.6
Own 16.8 to 25.2 acres.....	3.6	5.1	.3	0	2.0	5.3	3.8
Own more than 25.2 acres.....	.9	1.1	.1	0	.6	3.1	1.1
Total farmers.....	77.1	68.1	60.3	52.0	37.9	31.4	58.7

<sup>1</sup> Based on official reports (5).

NOTE.—Vertical columns add to 100 percent.

Table 12 shows a number of interesting relations. In the first place, it indicates that the average figures for the State as a whole fail to give an adequate picture of the conditions within individual forest districts.

The region designated A, which includes the Spessart and Rhön districts of northwestern Bavaria, is characteristically a region of poor soil and numerous very small farms inadequate to support their owners. This condition is reflected in the high percentage of workers living on farms (mostly on very small farms), and by the high percentage of regular workers.

The general economic situation is somewhat similar in region E, but the status of the forest workers is quite different. This region includes the hill and mountain districts along the eastern and north-eastern borders of the State, from the Bavarian Forest (Bayerische Wald) to the Franconian Forest (Frankenwald). Like region A, it is a region of submarginal agriculture, generally large families, and considerable economic distress. The percent of regular workers, however, and the percent of workers owning farms, are among the lowest in Bavaria. Apparently many of the workers are drawn from local industrial occupations; none come from a distance.

Quite a different picture is presented by region F, the high mountains of southern Upper Bavaria. This, because of its rough topography and high altitudes, is not so thickly settled as the other regions, and farming is less important. In consequence the number of forest workers living on farms is lower than elsewhere, and the percentage of occasional workers is relatively large. The average size of farm occupied by forest workers is much larger than in any of the other regions; more than half of the farms exceed 8.4 acres in area.

Regions C and D, which constitute the Palatinate (Bavaria west of the Rhine), resemble each other as far as land ownership by regular workers is concerned, but region D (the Rhine lowlands) has a relatively large number of occasional workers (the highest percentage of any region except E) and region C has relatively the fewest. In both these regions the farms are exceedingly small; 94 to 99 percent of them are less than 8.4 acres in size, and approximately 60 percent are less than 2.5 acres.

In the rest of the State (region B), which includes much of the lowlands and rolling, hilly country as well as the Jura, more or less average conditions prevail. Most of the workers are classed as regular employees, two-thirds of them live on farms, and three-fourths of these farms range from 2.5 to 16.8 acres in area.

#### EMPLOYMENT POLICIES

In some parts of western Germany, timber cutting may be considered almost a profession. The art—and at its best it is an art—has been handed down from father to son through many generations. This is particularly true in such regions as the Bavarian Alps, the Fichtelgebirge, the Bavarian Forest of eastern Bavaria, the Thuringian Forest, the Black Forest, the Erzgebirge of Saxony, and the Harz Mountains. It is also true of parts of the Austrian Alps, where the workers have practically an hereditary claim to employment in the public forests. The workers in these regions have developed great skill in felling, cutting up, and skidding out the timber, so that not only is the logging done efficiently from the standpoint of cost, but a minimum of damage is done to the forest. The skill with which large trees—2 or 3 feet in diameter and 100 to 150 feet tall—can be felled and pulled out practically without injury to the surrounding young growth is almost uncanny. The regular forest workers in these districts are regarded with considerable respect as important, substantial members of the community.

With the expansion of industry and growth of the cities, beginning in the early decades of the nineteenth century, many of the younger workers entered other occupations, attracted by higher wages, better provision for sickness and old age, easier work, better social position, and the more agreeable life of the cities. This process, well under way by 1850, had gone so far by 1890 that there was a shortage of woods workers (38). It was impossible to hire enough girls to do planting and other cultural work, because they preferred to work as servants in the cities. It was necessary, therefore, to employ men for this work, but they cost more and did less satisfactory work. As a result, much of the early weeding and thinning that should have been done was omitted. The yield of the forests was thereby impaired in quantity and in quality.

Although wages were gradually raised and better houses and working conditions provided, this was done too slowly. As a result, the permanent forest workers practically disappeared in most regions, as the older ones died, and were replaced by part-time industrial workers and farm laborers and by small farmers who cared less for high wages than for assured supplies of firewood and of litter for bedding. By 1900, there were very few full-time forest workers in western Germany (outside of the Harz and a few other regions), excepting the foremen. Since then, the situation has improved with better wages and working conditions, so that it has usually not been difficult to get enough workers. In East Prussia, forest work has always been an adjunct of agriculture and nearly all woods workers are farmers or local artisans.

The present policy is generally to build up and maintain a force of regular workers—not necessarily engaged on a full-time basis, but employed year after year, and so far as possible rooted to the land. The recent trend toward more intensive silviculture demands skilled, dependable, careful workers, who were not so essential under the old mass-production methods of clear-cutting and artificial regeneration of pure stands.

Wagner (39) points out the advantages of giving steady employment to as many workers as possible, except in case of small farmers who need such work only in the winter. He says:

Wood cutters, as well as persons engaged in planting and other cultural operations, being skilled workers, must be employed as continuously as possible. Irregular work easily results in unskilled workers, because it offers only an uncertain support, because skill and practice are lost and because the irregular worker is little inclined to equip himself with the best and consequently the more costly tools and to keep them in good condition. Also in forestry the fact deserves especial consideration that the permanent worker feels especially concerned with the weal and woe of the forest, his regular working place, and therefore is ready to defend it from harm.

In selecting workers now, preference is given to established residents of the community, preferably those owning some property, but not enough to be self-supporting without the forest job. Part-time workers settled on the property of the employer are also favored. Before the depression it was necessary in many places to hire transient workers because not enough others were available, but now most of these are employed only on an emergency basis, through various relief funds. Some of the large private estates in Austria and Czechoslovakia, and presumably also in Germany, have kept their regular workers employed during the depression, even at a financial loss, in order not to lose experienced workers who will be needed later. The same policy has been pursued in many of the State forests. In East Prussia, for example, men have been given yearlong jobs building roads and making other improvements when not engaged in logging.

Present employment policies in Germany tend to favor men over women, and particularly men with families. However, men are not considered satisfactory for some kinds of forest work, from the standpoint of either cost or efficiency. This is especially true of planting and cultural operations in very young stands. It is asserted that women take more pains than men in planting and in weeding operations. The peasant women are physically able to do this kind of work, because they are accustomed to doing a major portion of the work on the farms. Logging and similar heavy work, such as road

building, is left almost exclusively to the men. The proportion of women workers in the State (and probably also the communal) forests is much higher than in other forests, because of the more intensive planting and cultural operations in the public forests.(9).

#### EMPLOYMENT POLICIES IN BAVARIA

The instructions of the Bavarian State Forest Service (6), for example, specify that in employing new workers preference shall be given to local people, especially small property owners and those engaged in seasonal industries. No nonresidents may be employed as long as local people capable of doing the work are available. This applies to both permanent and temporary jobs. When necessary to lay off workers, special consideration must be given to regular workers, heads of families, and workers who depend upon wages for their existence. It is stated that:

The small property owner who is attached to his native soil is and will continue to be the most reliable and efficient worker in the State forests; even in times of political revolution he remains true to his employer, and he resists best the temptation to turn his back on the forest work when there are opportunities for higher earnings in other occupations.

Such persons must form the backbone of the work force; propertyless workers are more subject to political and economic unrest and are likely to leave the generally lower paid forest jobs at the first opportunity.

In employing workers, then, the employing officer is required to consider the following factors:

- Ability to do the work.
- Need for employment, especially in case of local people.
- Housing status: home ownership, other property, debts.
- Family status: wife and other dependents.
- Special circumstances: long service, injuries received in forestry work or in the World War, etc.

Under normal conditions, unless there are heavy debts or sick and aged dependents, a property with 12 to 15 Tagewerke (10.1 to 12.6 acres) of cultivated and meadow land of average quality will support a family without outside work. Owners of areas larger than 12.6 to 16.8 acres are not to be employed, as a rule, except as foremen. Most workers in the Bavarian State forests who own land have less than 8.4 acres; most of those with larger holdings are persons who have acquired the land gradually, by dint of hard work and thrift. It is not deemed good policy to turn them out now to make room for relief cases.

Other reasons for favoring local residents over those from a distance are: The seasonal character of most of the work, much of it in winter, makes it peculiarly suitable as a supplement to farm work; skilled workers, familiar with local conditions, are required for most phases of the work; the State forests must be operated on a reasonably efficient basis, not merely to furnish work to the unemployed. Outside workers can be and are used mainly on unskilled jobs that are done in summer, such as road construction.

Persons over 65 are not eligible for employment as forest workers, except in case of exceptionally able foremen or group leaders. In the

high mountain country the age limit for timber cutters and haulers is set at 55 to 60 years. As shown in table 13, there are relatively few regular workers under 21 or over 60 years old, and the proportion between these ages tends to increase. More than one-third of the occasional workers, on the other hand, are young people under 21. Most of these are employed during the planting season.

TABLE 13.—*Percent distribution of male and female laborers in the State forests of Bavaria, by age classes, 1925 and 1931*<sup>1</sup>

REGULAR WORKERS, EMPLOYED 100 DAYS OR MORE

Age class (years)	1931		1925	
	Males	Females	Males	Females
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Under 16.....	0.2	1.1	0.9	6.5
16 to 18.....	.6	1.8	1.6	6.3
18 to 20.....	1.6	5.5	3.4	9.2
21 to 30.....	18.0	25.4	21.5	30.8
31 to 40.....	23.8	23.4	19.0	12.1
41 to 50.....	22.1	18.3	24.5	13.4
51 to 60.....	24.0	18.8	19.4	12.6
61 to 65.....	7.5	<sup>2</sup> 5.7	<sup>2</sup> 9.7	<sup>2</sup> 9.1
66 to 70.....	1.8			
Over 70.....	.4			
All ages.....	<i>Number</i> 9,435	<i>Number</i> 437	<i>Number</i> 15,323	<i>Number</i> 1,297

OCCASIONAL WORKERS, EMPLOYED LESS THAN 100 DAYS

Under 16.....	11.0	7.2	11.1	16.9
16 to 18.....	10.3	11.9	7.2	15.3
18 to 20.....	11.6	15.4	8.1	15.6
Over 20.....	67.1	65.5	73.6	52.2
All ages.....	<i>Number</i> 8,779	<i>Number</i> 18,068	<i>Number</i> 24,049	<i>Number</i> 21,074

<sup>1</sup> Based on official reports (5).

<sup>2</sup> Includes all over 60.

NOTE.—For each class of workers, columns total 100 percent vertically.

EMPLOYMENT POLICIES IN WURTTENBERG AND BADEN

The instructions of the Wurttemberg Forest Service also state that preference shall be given to workers living near the forest, and to those dependent for part of their livelihood on forest work. In order to save travel time, work is to be assigned, so far as practical, to the workers living nearest to the place where the work is to be done. In both Wurttemberg and Baden outsiders are not supposed to be brought in to do forest work; if there are not enough local persons in need of work, small farmers may be hired. Needy persons are generally to be employed rather than those who have farms large enough to support them (1, v. 16, p. 520).

In Baden, at least, some of the work of timber cutting in communal forests was formerly given to the lowest bidders. In 1935 the Reich's Minister of the Interior put an end to this practice, on the ground that farmers' sons who did not need the work had been underbidding unemployed men and small landowners who did need it (1, v. 17, p. 901).

## EMPLOYMENT POLICIES IN PRUSSIA

In 1934 the head of the Prussian Government issued instructions to the forest supervisors (Forstmeister) regarding employment of laborers (20, v. 16, p. 548). So far as practical, they are required to give winter work to small landowners and seasonal workers who cannot make enough to live on from other sources. Forest work that can be done in winter and deep snow is to be deferred until winter. Work suitable for unskilled laborers should be reserved for them, as they cannot be used for timber cutting. Young single workers are to be laid off in the summer so that they will work on farms, and permanent workers are also to be put at the disposal of farmers during the planting and harvest seasons. (There has been a shortage of farm labor in some parts of Prussia.) Workers who are economically independent by reason of an income from their farms or from other sources are to be discharged. In districts with too many experienced woodcutters, hours are to be shortened so that all may work; where there are too few skilled workers, the policy is to train local farmers or artisans who are likely to be available for several years. Young men are to be taken on for training only after having served in the Labor Service (such service was voluntary in 1934). In employing new workers, preference is to be given to married persons with several children and, other things being equal, to members of the National Socialist Party organizations and war veterans. The local labor office is to be consulted in employing or discharging workers.

The migratory lumberjack as known in the United States is rarely found in Germany today.<sup>6</sup> Where workers are unevenly distributed, as in the Harz Mountains, it is not possible for all of them to live at home during the logging season. It is generally the policy to give the work nearest home to married men with families, and to send the younger, unmarried men to the more distant jobs, where they live in camps. In special cases, as where fires, windstorms, or insect epidemics necessitate quick cutting of abnormally large quantities of timber, large numbers of laborers have to be brought from a distance. In the Rominten forest of East Prussia, for example, 500 men were brought from other East Prussian forests to cut 200,000 cubic meters of defoliated spruce in one district.

As in Baden, some of the communes in western Prussia have been in the habit of letting logging in their forests to low bidders. In 1933 they were ordered to give up this practice and instead, to select reliable foremen and hire workers at a reasonable fixed wage. Preference is to be given to unemployed persons with dependents and not enough land to support them without supplementary work. Other conditions being equal, war veterans (Frontkämpfer) and members of the party units are to be given the preference. Lists of eligible laborers are made up by the head of the commune and the local leader of agricultural workers, and checked by party officials to insure that they are of approved racial origin and political views. Enough experienced wood cutters must be employed to insure that the work is well done (1, v. 15, p. 639).

<sup>6</sup> The practice of hiring woods crews of migratory German and foreign laborers in some forest districts grew up after 1900, owing to shortage of local workers. Such crews were usually hired through a contractor. The practice has been discontinued except in case of emergencies (35).

ORGANIZATION OF FOREST WORKERS<sup>7</sup>

Before 1918 the workers had little voice in fixing wages, working conditions, and terms of employment. In 1912 the workers in each protection district employing 10 or more laborers were given the right to choose a spokesman (Vertrauensmann) to deal with the forest officials. After the 1918 revolution, unions were recognized and participated in negotiating working agreements. Such agreements between the Prussian State Forest Service and the unions were adopted in 1919, 1920, and 1923.

Under these agreements the standard day's work was set at 8 hours, with a 10-hour day for planting and work on the forest officers' cropland.<sup>8</sup> Extra pay was provided for Sunday and overtime work. In winter (October to March, inclusive) 7 hours is generally standard, and in summer 9 hours. It is necessary to have fairly short working days in order to let the workers cultivate their own farm land, so far as this cannot be done by other members of their families.

In 1918 provision was made for workers' committees in each ranger district (Oberförsterei), composed of representatives elected by the workers in each protection district (Försterei). The system was modified in 1920 and again in 1923. In the latter year it was provided that each Försterei with three or more eligible voters (regular workers or workers over 18 employed on the day of the election) should choose a representative as a member of the workers' council of the ranger district. The councils had considerable voice in determining wages and working conditions.

The system was again changed after the adoption of the National Labor law of 1934. Now any forest unit (Forstamt) with 20 or more workers has a council (Vertrauensrat) chosen from the regularly employed men and women. All workers, including those employed temporarily, are allowed to vote on a list of candidates selected by the Forstmeister in consultation with the local party leaders. A candidate must be at least 25 years old; must have had 2 years' experience in forest work, including at least 1 year on the forest in question; must be of good character; and must be a member of the German Labor Front (Deutsche Arbeitsfront), but not necessarily of the National Socialist Party. The council consists of 2 to 10 members, depending on the number of workers on the forest. Its function is to advise the Forstmeister regarding working conditions, etc.; decision is left to him or his superiors. There is to be a special trustee of labor (Treuhand der Arbeit) in each of the larger States, to exercise general supervision over forest-labor problems and settle disputes. He is a Reich official. He may establish uniform minimum wage rates for groups of forests, may remove members of the councils whose service is unsatisfactory, and may appoint councilors if the workers do not accept the slate nominated by the Forstmeister.

The council members serve 1 year, without pay, except that they receive regular wages for any time lost on account of their duties on the council, and necessary expenses. A majority of the council may appeal to the trustee of labor in case of dissatisfaction with wages or terms of employment fixed by the forest officer. Working conditions

<sup>7</sup> Based on (20, v. 16, pp. 339-540; 25; 27; 38).

<sup>8</sup> The Forstmeister or Oberförster and his assistants are usually provided with a small area of land for garden, field crops, and pasture.



and regulations covering wages, hours, time and method of paying wages, safety requirements, etc., are to be set forth in writing by the Forstmeister where there are 20 or more workers. Workers are protected by law against unreasonable discharge. The law retains the 8-hour day as standard.

Labor unions are no longer allowed to exist, but all forest and agricultural workers (including owners) are automatically members of the Reichsnährstand, which as a body is affiliated with the Labor Front. The aim of the Labor Front is to train all workers in the National Socialist political and social philosophy, and to train them in the technique of their jobs. It also carries on various kinds of social work such as emergency aid to the poor and provision of recreational facilities and vacations for workers and their families. The object of the Reichsnährstand is the promotion of the common interests of all persons engaged in agriculture and forestry.

Since September 1935 every worker must have a workbook (Arbeitsbuch) which shows his training, experience, and qualifications. Without this book he cannot be employed.

### WAGES AND WORKING CONDITIONS

Wages for woods work in Germany were very low (19 to 50 cents a day) a hundred years ago. The rates were increased about the middle of last century, but for many years remained about 20 percent below industrial wages. The State forests, like those in private ownership, were managed primarily for profit, hence wages were kept as low as possible. Most of the woods workers had no other opportunities for earning during the winter, and were more or less content with low wages as long as they were sure of getting firewood and leaf litter to bed their cattle.

In 1912 forest workers' wages in Prussia ranged from 22 to 36 pf. an hour (equivalent to 5.2 to 8.6 cents). Farm laborers got about the same as forest workers—4.5 to 9.8 cents an hour in 1914. This was considerably less than wages of industrial workers, whose hourly wages in 1912 were (29) as follows:

	<i>Cents</i>
Wood-working industries.....	10.5 to 14.5
Mining.....	9.0 to 18.6
Metal trades.....	10.2 to 15.7
Chemicals.....	10.9 to 13.6
Building trades.....	13.3 to 16.9
Textiles.....	9.0 to 11.2
Railroads.....	9.4 to 15.2

In the Königsberg district of East Prussia, as late as 1891, the average daily wage of forest workers was M1.02 (24 cents), with a minimum of 59 pf. (14 cents). In 1906 wages were raised to nearly the level of industrial wages, after allowing for the cheaper rural living costs. In 1913 the daily rate was 40 cents to \$1.07, and in 1917 it ranged between 58 cents and \$1.43. In 1918 extra allowances were added, depending on number of children. Later, the fees formerly paid to foremen out of workers' wages were paid by the State, allowances were made for traveling long distances to work, and extra allowances were given to help the workers buy their tools.

<sup>9</sup> Discussion based largely on Treitschke (58). A brief summary of conditions in Austria is given in the Appendix, p. 51.

Since the World War, the increase in forest workers' wages greatly exceeded the increase in living costs; timber prices increased for a time but decreased greatly after 1930. Table 14 gives the relative wages, cost of living, and timber prices in Prussia from 1928 to 1932 on a basis of 1911-12 as 100 (12).

TABLE 14.—*Relative wages, cost of living, and timber prices, Prussia, 1928-32*

[Wages in 1911-12=100]

Item	1928	1930	1931	1932
Wages.....	206	248	246	196
Cost of living.....	151	150	139	124
Timber price.....	166	122	87	71

Timber cutting is generally paid for on a piece-work (Akkord) basis. The Akkord system is especially suitable for logging, because the men work in small crews and continuous supervision is difficult. Work in planting and road construction and maintenance, which is usually done by fairly large gangs and can easily be supervised, is generally paid for on an hourly basis, with sliding scales according to sex, age, and locality. At first there were three different local rates, depending on local differences in living costs and wage rates; then the number was increased to six, and later it was reduced to five and then to four. In 1922 the principle was adopted of paying an additional wage according to size of family; need, as well as performance, was made a basis of wages.

Until just before the war, wages were usually paid at the end of the season, after the timber was sold, although advances had to be made. Later, payments were made monthly or semimonthly. Now, payment every 2 weeks is standard practice, and a worker can get an advance at the end of any week. After 1904 it became customary to pay one-third of the regular wage when the worker was called away for military training (up to 14 days a year) if he was married and the main support of a family, as well as for absence on account of various required meetings or for urgent personal reasons such as weddings, serious illness, or death in the family. After 1919, full pay was allowed for legal holidays and for absence on account of voting, moving, birth of children, illness, funerals, etc. Since 1925, full pay has been granted when the worker was incapacitated by illness or accident, up to 10 percent of the number of days worked during the preceding year. Since 1920, a vacation with full pay has been allowed, of 5 days if employed for 170 days in the preceding year, 6 days for 200 days' work, and 7 days for 230.

#### FOREST WORKERS' WAGES IN PRUSSIA

The method of grading wage scales according to sex, age, and locality is illustrated by the rates effective in the State forests of Prussia (38) as of June 30, 1924 (table 15).

The average daily earnings of workers in the State forests of Prussia are shown in table 16. Timber cutters' earnings have averaged considerably higher than the earnings of most other workers, and women earned, on the average, only about half as much as men.

TABLE 15.—Hourly wages of workers in Prussian State forests, by sex, age groups, and locality class,<sup>1</sup> June 30, 1924<sup>2</sup>

Sex and age	Class 1	Class 2	Class 3	Class 4	Class 5
Males:	<i>Pfennigs</i>	<i>Pfennigs</i>	<i>Pfennigs</i>	<i>Pfennigs</i>	<i>Pfennigs</i>
Under 15.....	12	12	12	11	11
15 to 16.....	15	14	14	13	13
16 to 18.....	19	18	18	17	17
18 to 21.....	29	29	28	27	25
21 to 24.....	33	32	31	30	29
Over 24.....	34	33	32	31	30
Females:					
Under 16.....	12	12	12	11	11
16 to 18.....	17	16	16	15	15
Over 18.....	23	22	21	20	19

<sup>1</sup> Group classification based on local conditions as to living costs, etc.<sup>2</sup> 1 pfennig=0.238 cents in 1924.TABLE 16.—Average daily earnings of timber cutters and other workers in State forests of Prussia, 1927-34<sup>1</sup>

Year	All classes of work <sup>2</sup>		Timber cutting, men	Year	All classes of work <sup>2</sup>		Timber cutting, men
	Men	Women			Men	Women	
	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>		<i>Marks</i>	<i>Marks</i>	<i>Marks</i>
1927.....	5. 11	2. 29	( <sup>3</sup> )	1931.....	6. 06	3. 01	8. 16
1928.....	5. 41	2. 71	6. 83	1932.....	4. 78	2. 43	6. 17
1929.....	6. 08	2. 96	7. 73	1933.....	4. 27	2. 29	5. 27
1930.....	6. 40	3. 11	8. 65	1934.....	4. 32	2. 24	5. 40

<sup>1</sup> Based on official reports (24). 1 mark (gold value)=23.8 cents prior to 1934; about 40 cents in 1934 and subsequent years.<sup>2</sup> These wages do not include bonuses paid to foremen, or State contributions to social insurance fund. They do include vacation pay, allowances for sickness, etc.<sup>3</sup> Data for 1927 not available.

Wage rates and earnings vary rather widely in different parts of Prussia, depending on local conditions. In 1933, for example, the average earnings of male workers ranged from RM 3.57 in the Trier district to RM 4.98 in the Erfurt district, and for women, from RM 2.07 (Schneidemühl) to RM 2.58 (Allenstein). For piece work the absolute range is much greater than for hourly wages, owing to local or temporary conditions such as bad weather, difficult topography, especially good or especially poor timber. Table 17 shows the maximum and minimum daily earnings of able-bodied men (over 21 years old, for those paid on an hourly basis) for a full 8-hour day.

TABLE 17.—Range of daily earnings, at piece work and hourly wage, of able-bodied male workers in Prussian State forests, 1926-34<sup>1</sup>

Year	Paid on piece basis		Paid on hourly basis		Year	Paid on piece basis		Paid on hourly basis	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>		<i>Marks</i>	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>
1926.....	1. 44	11. 90	3. 12	3. 78	1931.....	1. 36	14. 64	4. 56	5. 04
1927.....	1. 19	13. 40	3. 28	3. 87	1932.....	1. 12	11. 76	4. 16	4. 88
1928.....	1. 28	14. 72	3. 84	4. 84	1933.....	1. 04	10. 72	3. 52	4. 40
1929.....	1. 32	21. 36	4. 56	5. 04	1934.....	1. 01	12. 32	3. 12	4. 16
1930.....	1. 36	16. 48	4. 56	5. 04					

<sup>1</sup> Based on official reports (24). 1 mark (gold value)=23.8 cents prior to 1934 and about 40 cents thereafter.

These are exclusive of foremen's bonuses (which averaged 12 Rpf.<sup>10</sup> a day for all workers in 1933 and 1934), pay for days on vacation and sick leave, etc. (averaged 12 Rpf. a day for all workers in 1933 and 16 Rpf. in 1934), and State contribution to social insurance (averaged 32 Rpf. a day per worker in 1933 and 22 Rpf. in 1934). The highest wages on an hourly basis were paid in the western districts and the lowest in East Prussia.

Workers are required to furnish their own tools and keep them in good working order. Frequently, they are paid an allowance in addition to their wages, to be applied on the purchase and maintenance of tools, and in some instances the State gives an extra allowance to induce workers to acquire new and improved types of equipment, such as saws. The object of this, of course, is to increase production per man-hour and consequently to reduce costs.

Between 1927 and 1934 the average yearly earnings from work in the State forests of Prussia ranged, for men, from RM608 (about \$144) in 1930 to RM310 (about \$74 in 1933) (table 18). Owing to the devaluation of the dollar the 1934 earnings of RM363 were about the same in terms of dollars as the nominally higher earnings of 1930.

TABLE 18.—Average yearly earnings of male and female workers in the State forests of Prussia, 1927-34<sup>1</sup>

Year	Males	Females	Year	Males	Females
	<i>Marks</i>	<i>Marks</i>		<i>Marks</i>	<i>Marks</i>
1927.....	498	66	1931.....	524	69
1928.....	547	76	1932.....	335	35
1929.....	594	79	1933.....	310	42
1930.....	608	80	1934.....	363	45

<sup>1</sup> Based on official reports (24).

For year-long workers, of course, the earnings were much larger. As long ago as 1908 the workers in the Harz region of Hanover earned from RM800 to RM1,200 (\$190 to \$285) a year (14).

Total wages paid to laborers in the Prussian State forests averaged more than RM 45,700,000 a year during the period 1927-31 (\$10,900,000), decreased to RM25,000,000 in 1932, and rose to RM38,000,000 (over \$15,000,000 in terms of devalued dollars) in 1934. This is for an area of approximately 6,000,000 acres.

#### FOREST WORKERS' WAGES IN BAVARIA

Average wage rates for adult male workers in Bavarian State forests (5) increased from 28.6 pf. an hour in 1913 to a peak<sup>11</sup> of 68.0 pf. from December 1929 to February 1931, since when there was a rapid decline to 50.7 pf. in February 1933. The maximum hourly rates increased from 33 pf. to 77 pf. plus 4 pf. additional for heads of families, then declined to 51 plus 4 pf. (table 19).

<sup>10</sup> One Rpf. (Reichspfennig) is equivalent to 0.4 cents. Prior to 1934, 1pf.=0.238 cents.

<sup>11</sup> Wages during the inflation period (1922 to early in 1924) reached such fantastic levels that they are omitted from the official statistics.

TABLE 19.—*Maximum and average hourly wages for adult male workers, with extra allowance for heads of families, in Bavarian State forests in 1913 and 1924-33*

Date effective	Maximum		Average	Date effective	Maximum		Average
	Base rate	Extra allowance			Base rate	Extra allowance	
	<i>Pfennigs</i>	<i>Pfennigs</i>	<i>Pfennigs</i>		<i>Pfennigs</i>	<i>Pfennigs</i>	<i>Pfennigs</i>
1913.....	33	0	28.6	October 1928.....	75	4	66.0
May 1924.....	35	3	33.7	December 1929.....	77	4	68.0
October 1924.....	50	3	40.5	February 1931.....	73	4	65.7
March 1925.....	55	3	44.8	November 1931.....	63	4	58.5
July 1925.....	63	3	49.5	January 1932.....	55	4	53.0
April 1927.....	68	3	53.2	October 1932.....	53	4	53.0
February 1928.....	71	3	56.6	February 1933.....	51	4	50.7

The standard employment agreement (6) adopted in October 1931 prescribed an 8-hour day and 48-hour week (or 40 hours if mutually agreeable), with 25 percent additional pay for overtime and 50 percent additional for work on Sundays, holidays, or between 8 p. m. and 6 a. m. Three basic rates of hourly wages were established, according to locality,<sup>12</sup> and it was provided that wages for various classes of workers would be the following percentages of the base rate:

Men and boys:	Percent	Women and girls:	Percent
16-18 years.....	60	16-18 years.....	45
18-20 years.....	90	18-20 years.....	55
Over 20 years.....	100	Over 20 years.....	60

Married workers (heads of families) got 4 pf. an hour more, and workers living in camps during the week 9 pf. more. Foremen got at least 4 pf. more than ordinary laborers, and persons engaged on especially hazardous work, 9 pf. extra. An allowance of 8 percent of wages was given for upkeep of tools and equipment to persons skidding and hauling timber; wood cutters in the plains received 4 percent for this purpose, and wood cutters in the mountains 5 percent. Tools for felling and skidding (axes, saws, wedges, cant hooks, hand sleds, hoes, and shovels) are sold to the workers at a fixed price, or at market price if that should be lower. The Forest Service provides and maintains planting and road-building tools and heavy equipment such as stump pullers.

Vacation with pay is allowed after 1 year's service, at the rate of 2 days for 170 to 200 days, or 3 days for more than 200 days' service in the preceding year, increasing by 1 day for each year's service up to a maximum of 10 days' vacation. Absence on account of illness not to exceed 3 weeks in a year is counted as employed time in computing the vacation allowance.

Average daily earnings in various kinds of work in the Bavarian State forests are shown in table 20.

The higher average wages for logging are explained by the fact that this work is done almost entirely by adult men, and also by the fact that 75 to 85 percent of it is paid for on a piece-work basis. In 1933, 87 percent of the regular loggers were paid at piece rates, but only 8 percent of the emergency workers were so paid. Earnings in road

<sup>12</sup> As of February 27, 1933, these rates were 51, 47, and 45 pf. (12.1, 11.2, and 10.7 cents) an hour.

construction come next to logging; this work is also done chiefly by adult men, but 90 to 95 percent of it (81 percent in 1913) is paid for on an hourly basis. The lowest average earnings are in planting and cultural operations, most of which are done by women and by boys and girls under 16. Less than 1 percent of this class of work is paid for at piece rates. From 94 to 97 percent of the miscellaneous work is paid for by the hour.

TABLE 20.—Average daily earnings of workers at various activities in the State forests of Bavaria, 1924-33<sup>1</sup>

Year	Log- ging	Plant- ing and cultural opera- tions	Road con- struc- tion	Other work	All work	Year	Log- ging	Plant- ing and cultural opera- tions	Road con- struc- tion	Other work	All work
	Marks	Marks	Marks	Marks	Marks		Marks	Marks	Marks	Marks	Marks
1924.....	3.40	1.94	2.84	2.16	2.89	1930.....	6.66	4.12	5.56	4.75	5.68
1925.....	5.13	2.66	3.96	3.02	4.16	1931.....	6.27	3.81	5.29	4.33	5.37
1926.....	5.30	2.77	4.05	3.27	4.34	1932.....	5.01	2.95	4.25	3.55	4.56
1927.....	5.53	2.97	4.31	3.39	4.54	1933 <sup>2</sup> .....	4.75	2.78	4.06	3.30	4.39
1929.....	6.68	3.86	5.33	4.33	5.54	1933 <sup>3</sup> .....	3.78	3.25	4.07	4.01	3.76

<sup>1</sup> Classified figures for 1928 not obtained; the average for all kinds of work was 4.93 marks.

<sup>2</sup> Earnings of ordinary laborers.

<sup>3</sup> Earnings of emergency employees from relief rolls.

Earnings on a piece-work basis are consistently higher than those on an hourly basis (table 21). This is largely due, of course, to the fact that piece work is mostly done by men who would fall in the higher wage groups anyway. It is generally the policy, however, to set piece rates so that an average worker can make about 25 percent more than he would under an hourly rate.

TABLE 21.—Average daily earnings, hourly wage and piece work, in the State forests of Bavaria, 1913 and 1924-32

Year	Earnings under hourly rates	Earnings under piece rates	Year	Earnings under hourly rates	Earnings under piece rates
	Marks	Marks		Marks	Marks
1913.....	2.38	2.70	1928.....	3.96	6.65
1924.....	2.29	3.55	1929.....	4.49	7.14
1925.....	3.09	5.45	1930.....	4.72	7.11
1926.....	3.32	5.56	1931.....	4.45	6.56
1927.....	3.51	5.92	1932.....	3.70	5.12

The average earnings vary not only from year to year, but also from one locality to another, just as in Prussia. This is particularly true of timber cutting and skidding, which is largely paid for on a piece-work basis, for local variations in timber and topography influence output. Table 22 shows the range of earnings in logging in the forests of the Upper Bavarian plain and hill region (not including the mountains).

For final crop cutting the lowest average was RM 4.16 (about \$1), the highest RM 6.16 (about \$1.50), and the average for all units RM 5.20 (about \$1.25). For intermediate cuttings the lowest average earning was RM 3.56, the highest RM 5.92, and the average RM 4.78.

TABLE 22.—Range of average daily earnings of timber cutters on different forest units and types of cutting, in the State forests of Upper Bavaria, 1932<sup>1</sup>

Range of earnings (marks)	Forest units		Range of earnings (marks)	Forest units	
	Final crop cutting	Inter-mediate cutting <sup>2</sup>		Final crop cutting	Inter-mediate cutting <sup>2</sup>
	Number	Number		Number	Number
3.51 to 4.00.....	0	3	5.01 to 5.50.....	19	9
4.01 to 4.50.....	3	11	5.51 to 6.00.....	9	5
4.51 to 5.00.....	11	11	6.01 to 6.50.....	2	0

<sup>1</sup> Based on unpublished official records.<sup>2</sup> Thinning, improvement cutting, etc.

## FOREST WORKERS' WAGES IN WURTTENBERG

Standard wage regulations for workers in private forests in Wurttemberg and Hohenzollern were set forth by the trustee of labor for that district in 1935 (1, v. 17, p. 1186). A minimum hourly wage of 40 pf. (about 16 cents) was established for males over 20, with 4 pf. additional for married men or those with dependents. Travel time in excess of 2 hours a day is to be paid for. Piece rates are set so that good workers can earn 10 to 15 percent more than the minimum hourly rate. Additional pay is to be given where the work is especially difficult on account of steep topography or dense, low branches, etc. Leave with pay is to be allowed after the first year; 3 days is allowed if the worker was employed for 200 days in the preceding year, increasing by 1 day (up to a maximum of 10 days) for each year's service of 200 days or more. Two days' leave, increasing to 8 days, is allowed for employment of 170 to 200 days a year. In case of death or sickness in the family a worker may take off 8 hours with pay, if he has worked for 6 weeks. When work is stopped by bad weather, workers paid by the hour are entitled to pay for 1 hour more than they actually work.

The hourly wage rates in the State forests of Wurttemberg between October 1929 and March 1931 were as shown in table 23. These rates, which were the highest reached in Wurttemberg, were practically the same as those in Bavaria during the same period. The wage scales in the different States appear to have been about the same; for example, in January 1932, the top rate for adult men was 55 pf. an hour in Prussia and Bavaria, 56 pf. in Wurttemberg, and 59 pf. in Baden. Wages for boys from 16 to 21 were considerably higher in Baden than in the other States.

TABLE 23.—Hourly wage rates for male and female workers in four wage groups, in the State forests of Wurttemberg, by age classes, October 1929 to March 1931<sup>1</sup>

Age class (years)	Males <sup>2</sup>				Females			
	Group 1	Group 2	Group 3	Group 4	Group 1	Group 2	Group 3	Group 4
	Pfennigs	Pfennigs	Pfennigs	Pfennigs	Pfennigs	Pfennigs	Pfennigs	Pfennigs
14 to 16.....	31	29	27	25				
16 to 18.....	45	42	39	36	38	36	33	30
18 to 20.....	60	56	52	48	45	42	39	36
Over 20.....	75	70	65	60	49	46	42	39

<sup>1</sup> Based on official reports (41). Group classification based on local conditions as to living costs, etc.<sup>2</sup> Married men got 3 pf. additional.

## FOREST WORKERS' WAGES IN BRUNSWICK

The average daily earnings in various kinds of work in the Brunswick State forests, 1931 to 1933, are shown in table 24.

TABLE 24.—Average daily earnings of male and female workers at different classes of work in the State forests of Brunswick, 1931-33<sup>1</sup>

Class of work	1931		1932		1933	
	Males	Females	Males	Females	Males	Females
	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>	<i>Marks</i>
Logging.....	7.68	3.33	5.74	2.58	5.03	2.36
Planting, etc.....	6.03	3.20	4.63	2.67	4.15	2.27
Roads.....	6.51	3.62	4.97	2.55	4.14	2.41
Other.....	6.21	3.22	4.72			

<sup>1</sup> Based on official reports (7).

LABOR REGULATIONS IN BAVARIAN FORESTS<sup>12</sup>

The labor regulations of the Bavarian State Forest Service (adopted in 1921, with amendments through 1933) provide that the employment agreement covering wages, hours, and working conditions shall be signed by the workers. They agree to work overtime or at other jobs than usual, in case of emergency such as fire or unusual wind and snow breakage. Piece work is not to be done on Sundays or legal holidays or at night. Workers paid by the hour get 2 hours of rest periods during the day. The member of a crew who is responsible for starting the cooking or warming fire at camp is to be allowed sufficient time, with pay, to cut firewood and build the fire. The crew leader is responsible for paying the men, but must not do it in an inn. The purpose of this provision is to keep the men from spending their wages for beer.

Insurance premiums and taxes of various kinds are withheld from the wages, and one-fourth of the amount due (not to exceed 1 week's pay) may be held back as security for tools furnished by the management or to insure that the worker will stay until the job is done.

Workers are required to keep the camps clean, to be careful with fire, and to use only inferior wood for fuel. They may build fires of waste material to warm themselves or their food (except in danger periods), provided they take precautions to prevent damage. They may not carry away the ashes, however: to do so would rob the soil of valuable plant foods. Smoking of cigars, cigarettes, or uncovered pipes during dry weather is forbidden. Any personal property that the workers may have in camp is insured against fire by the Forest Service.

All crews are to be equipped with first-aid kits, and several workers in each crew are to be given first-aid instruction, preferably by a physician. Intoxicated persons are not allowed to work, and no one is supposed to undertake tasks that are too heavy for him. The rules contain detailed prescriptions regarding handling of tools and explosives, and means of avoiding accidents. They also contain detailed prescriptions regarding methods of felling and bucking trees, and sorting and piling logs and bolts. Concealing defects in a log is ground for dismissal. Workers agree not to carry away any forest product without a permit.

<sup>12</sup> Based on official reports (6).



Violations of these working rules may be punished by fines (generally not more than one-half day's wage), withdrawal of privileges (to take firewood, etc.), temporary lay-off, or discharge. Fines are paid into a fund for the support of sick and indigent forest workers. Offenses known to the forest officer and unpunished for 14 days cannot be punished later.

#### PRIVILEGES AND PERQUISITES OF FOREST WORKERS

Wages in woods work average considerably lower than those in industrial employment. This is possible partly because of the character of the work, which is largely supplementary to work on the farms or in local industries, and partly because of special privileges or concessions granted to the workers.

These include rights to gather berries and mushrooms free or upon payment of a nominal charge, rights to cut grass, gather litter, and pick up faggots, rights to get free firewood or to purchase it at reduced rates, provision of house and garden land at low rentals, and rights to pasture livestock in openings in the forests.

In Prussia, workers are allowed to take limited quantities of firewood at 70 percent of the forest base price (38). A person employed for 15 days a year is entitled to 1 stere (about one-third of a cord) of softwood or 5 steres of twigs; the amount increases with length of employment up to 12 steres (3½ cords) of large wood and 5 steres of twigs for persons employed 200 days in the year. In Thuringia regular workers (heads of households) get 6 steres of softwood or 4 steres of hardwood at 80 percent of the base price; women and single workers get less. In Saxony, workers get as much small fuel wood (twigs) as they can carry home, for 10 pfennigs (4 cents) a day. In Mecklenburg-Schwerin they get free from 2 steres for 40 to 79 days' work, up to 12 steres for more than 240 days. In Prussia, continuously employed workers were allowed (in 1919) to buy up to 30 marks' worth of good timber at the forest base price plus 10 percent, and 20 steres (about 5 cords) of small limb wood and 4 steres of larger hardwood fuel or 6 steres of softwood, at the base price. In 1925 the prices were reduced.

#### HOUSING AND FARM LAND

In most parts of central Europe the forest workers—whether farmers or industrial workers—live at home, either in villages or on their farms, where these are located outside of villages. Except in the mountains they usually live close enough to the forests so that they can go home at night, either on foot or on bicycles. In the mountain districts, such as the Bavarian and Austrian Alps and the Harz region, much of the work is so far from the villages that the workers have to live in the woods. In these cases cabins (Herbergen) are usually provided, equipped with bunks, straw mattresses, and facilities for cooking. Large logging camps are not common; usually a relatively small crew of men works in one place, and they usually go home over the week ends. In camp, each man furnishes and cooks his own food, over a common stove in the middle of the combined living and sleeping quarters. The newer camps contain separate rooms for living, cooking, and sleeping (14). An attempt was made in Prussia to introduce community eating, with camp cooks, but the workers preferred to bring and prepare their own food.

For many years the State (at least in Prussia) felt no obligation to provide housing for its forest workers. Only in 1877 was the Finance Department persuaded to allow the renting of houses to workers. By 1892 the Forest Service was renting 470 apartments in 214 houses. Since 1892 there have been appropriations almost every year to build workers' houses. These are ordinarily modest houses, frequently built of logs, and are mostly in districts where there are few settled workers, especially in the eastern provinces. Houses are usually built to accommodate two to four families. At the end of 1934 the State owned 1,199 forest-workers' houses, with accommodations for 2,268 families (24). This does not include the living quarters and administrative structures occupied by forest officers, which numbered about 5,000. There were also 100 camps (Herbergen), occupied during the logging season. The average rent charged the workers for houses was 99 marks a year in 1934 (about \$40).

Besides the living quarters, nearly 43,000 acres of arable and pasture land was leased to some 18,000 workers in the Prussian forests in 1934, at an average annual rental of about RM5 (\$2) an acre. The rentals vary, of course, with land values and local economic conditions. In 1934 the range was from RM2.6 in the Allenstein district of East Prussia (rather poor land and plenty of it) to RM10.4 in the industrial Oppeln district of Silesia. Since 1919 workers have been able to lease land for 18-year terms. In most districts such a lessee is obligated to work on the forest, at regular wages, whenever called upon to do so, and in some instances this applies also to the other adult members of his family. It is generally the policy to rent workers only enough land to provide food for their families, but not so much that they will not need the forest work (33). In some East Prussian forests most of the workers own their homes, and either own a few acres of arable land or rent it from the State. The aim is to give each worker at least 2.5 acres of land. Each family generally owns a cow or a flock of geese.

The communes and some of the large private forest estates make similar provision for their workers. On a private forest in East Prussia, for example, several of the permanent workers are given a house and garden for a rental of about \$30 a year, and can rent additional fields if desired. They also get 7 cords of firewood at half again the cost of cutting it, and summer pasture and winter feed for a cow at a low price. (Wages for wood cutters here were about \$2 for a 10-hour day in 1928.) In some cases private owners have helped their workers to buy or build houses of their own, either through advancing credits or through furnishing timber and other materials below market prices.

The main objective of public as well as of private forest management has usually been to make a profit. Income from the forests was an important item in the budgets of communes and States. Both the owners and the workers have desired to make as much as they could currently, and sometimes the long-time aspects have been overlooked. In the past, the workers were not bound to the forest, but had become an unrooted proletariat like the city workers; when a better job was offered they left the forests, and in many places there was a shortage of wood cutters (40). As Dieterich (11) points out, this unstable working force was not conducive to sustained-yield forest management—

for sustained-yield forestry must be based on an economically sound forest population, attached to the soil, not on a gypsy horde of wood cutters and adventurers or on portable sawmill operations.

Realizing that the tendency to desert forest work for the towns is likely to assert itself again when prosperity returns, recent administrations have undertaken to do more than has been done hitherto in the way of establishing settled workers on the forests. Although the workers might be forced to stay away from the cities, they would not make willing workers under such conditions. It is deemed preferable to make the worker feel that the forest is his home, hence the policy of leasing him land for a long term and helping him to own his house. It has been suggested that such leases be made practically hereditary (40).

Funds were made available in 1935 by the Reich's Labor Ministry for the construction of forest workers' dwellings. The policy is to build these in groups so that several families will be together, in places where the workers, with the help of their families, can raise part of their food in their spare time and thus save enough to pay for the houses. In Brunswick, for instance, plans were under way in 1934 for building 100 houses, at a cost of about RM5,600 (\$2,240) apiece; these were to be paid for, including interest and amortization, at the rate of RM24.80 (about \$10) a month (1, v. 16, p. 970).

According to instructions (22) issued by the Reichsforstmeister in 1935, a typical worker's house contains a combined living-room and kitchen, two bedrooms and space for another in the attic, and space for a cow. Each worker is to have at least 4 morgen (2.5 acres) of land, except that a permanent worker (practically full-time) may be given as little as 2 morgen, provided the forest administration certifies that it will make more land available if he ceases to be a permanent worker and needs an additional 2 morgen.

The Reich lends up to 90 percent of the cost of land and buildings, at 3 percent interest plus 1 percent amortization, but not to exceed RM 1,500 on the house, RM 700 on the land, and RM 300 on inventory (tools, equipment, stock). Workers who already have enough land and equipment may borrow up to RM 2,200 on the house. A commercial first mortgage up to RM 2,000 is allowed in addition to the Government loan. It is planned to build State-owned houses for forest workers in the future only in special cases.

#### SOCIAL INSURANCE

Since 1914, sickness, accident, invalid, and old-age insurance has been compulsory for agricultural and forest workers in Germany. For sickness insurance the employer formerly paid one-third, the worker two-thirds of the premium, but since 1934 they have contributed equally. The employer pays the entire premium for accident insurance, and both employer and employee pay one-half of the invalid and old-age pension premiums, to which is added a contribution from the Government. Accident insurance covers all workers, even those not employed directly by the forest owner, unless they are covered by some other insurance organization; the other forms of insurance apply only to regular workers directly employed by the owner or forest manager (26).

During the period 1926-34 the Prussian State Forest Service paid an average of nearly RM2,560,000 (over \$600,000) a year for workers'

insurance and pensions (24). During the period 1925-32 social-insurance payments by the State Forest Service of Wurttemberg (with about 500,000 acres of forest) averaged RM480,000 a year (\$114,000). Of this, RM122,000 was for sickness insurance, RM132,000 for invalid pensions, RM53,000 for unemployment insurance, and RM173,000 for accident insurance.

#### TRAINING OF FOREST WORKERS

During the last few years the policy of training woods crews has been widely adopted in Germany. This training has a twofold object: (1) To inculcate the prevailing political and social philosophy (nationalsozialistische Weltanschauung), especially in the case of the older workers who have not received such training through membership in the various party organizations (Hitlerjugend, Sturmabteilung, etc.); and (2) to acquaint the workers with the most up-to-date tools and technique. Training in technique is particularly necessary because of the policy of selective cutting which is now the official standard for all Germany, for this requires more skill than the clear-cutting methods that have been employed, especially in northern Germany, in the past. One of the greatest obstacles to the introduction of the new methods is said to be the scarcity of skilled wood cutters (29).

Saxony held its first training course in 1933, when one three-man and nine two-man crews were assembled at a Labor Service camp and instructed in the care and use of tools, and technique of felling and bucking, and thinning. Since then several courses have been held, usually lasting about 4 days, with 15 to 20 two-man felling crews taking part in each course. The best crews from each State forest have been selected for training, with the idea that they will stimulate the other workers to follow the improved methods. These crews are provided with new tools free or at nominal cost. They are required to advise and assist in accident prevention and in training their fellow workers, and they receive special pay for any time spent on such work. From now on the forest officers in each State forest unit (Forstamt) will be held responsible for training the workers, commencing with the middle-aged men. Training courses are to last several weeks, and are to include some elementary forestry, pruning, seed collection, construction of game fences, road maintenance, accident prevention, first aid and hygiene, physical training, advice on diet and clothing, tools and their use, and political instruction (16).

Baden started with a course for wood cutters in 1934, with such good results that four courses, two for older workers and two for young men, besides two for road workers, were held in 1935. These courses are given with the cooperation of the vocational training division of the German Labor Front which provides the political instructors. The courses for the older workers are conducted at the forestry college at Karlsruhe; those for younger workers at the camp of the vocational training division. Courses last 3 weeks for woodsmen, 4 days for road workers. Two-man crews who will continue to work together are selected for training. Enrollment in the first course included 26 boys 16 to 20 years old, but most of the trainees are somewhat older. The courses are open to workers in communal and private forests as well as to men employed by the State. The subject matter of the courses is much the same as in Saxony: Use of tools, elementary

forestry, methods of thinning, best methods of cutting up trees to minimize cull for rot and other defects, methods of felling and skidding to avoid damage to young growth, physical training, and political philosophy (1, v. 17, pp. 953-954; 3).

Thuringia has held several similar training courses, lasting about 6 days, with 20 to 30 participants in each course. Workers receive wages and expenses while in attendance at these courses (1, v. 17, p. 537.)

Brunswick constructed a special training camp to accommodate 24 men, at which it is planned eventually to train all of the State forest workers. Courses last for 8 days (1, v. 18, p. 169).

Wurttemberg held its first training course in the fall of 1935, with 8 foresters and 26 wood cutters in attendance (1, *Deut. Forstbeamztz.*, pp. 469-470, 475).

Hesse started with a 4-day course in 1934. The number of men in each course was limited to 30 (1, v. 16, p. 806).

In Prussia, a 4 weeks' course was given in the spring of 1935 for 27 young men, all of whom had served a year or more in the Labor Service and intended to become permanent forest workers. Most of them had worked in the woods and several were sons of woodsmen. They were given training in the use of tools, planting technique, forest protection against fire and fungus and insect pests, hygiene, first aid, and accident prevention. Lectures were also given on German history, race problems, history of forest labor, forest administration, silviculture, timber measurement, and properties and uses of wood. Similar courses have since been given for older workers and also for young foresters (1, v. 17, pp. 428-429; 2). Similar training camps have been held in several Prussian provinces, under the auspices of the State Forest Service, the German Labor Front, and the Reichsnährstand (1, v. 18, p. 211).

#### EMPLOYMENT IN SAWMILLS AND WOODWORKING INDUSTRIES

The number of persons employed in primary and secondary wood-consuming industries in Germany is very large. In 1907 more than 1,500,000 persons were engaged in manufacturing and distributing wooden products and in wooden building construction. These were classified as follows (29):

	<i>Number of persons</i>
Building construction (estimated; one-third all construction) -----	278, 067
Miscellaneous cabinet work -----	167, 193
Wooden vehicles -----	165, 362
Furniture -----	151, 787
Carpenters (not included in building construction) -----	124, 917
Paper and pulp -----	122, 758
Sawmills -----	98, 174
Parquetry and interior finish -----	66, 054
Turned and carved goods -----	49, 917
Rough woodenware -----	42, 439
Baskets -----	41, 281
Cooperage -----	37, 488
Lumber and timber dealers -----	30, 947
Brushes and brooms -----	26, 983
Pianos -----	26, 828
Timber preservation, etc -----	23, 370
Paper and pulp -----	22, 591
Furniture dealers -----	16, 289

	<i>Number of persons</i>
Resin products.....	13, 772
Canes and umbrellas.....	12, 553
Mirrors and picture frames.....	10, 851
Miscellaneous wickerware, etc.....	9, 674
Toys.....	8, 530
Matches.....	5, 694
Miscellaneous.....	17, 891
Total.....	1, 571, 410

According to the 1925 census of occupations, 966,000 persons were engaged in the lumber and timber industries in that year. These included:

	<i>Number of persons</i>
Engagement or industry:	
Wooden-building construction.....	472, 000
Sawmills and veneer plants.....	129, 000
Sash, planing-mill products, etc.....	104, 000
Woodenware, etc.....	82, 000
Containers.....	44, 000
Miscellaneous.....	135, 000

Besides these, 127,000 were employed in the paper and pulp industry and at least 30,000 in the timber trade (9). The above classification is different from that of 1907 and probably does not include all of the industries listed in the earlier year. In comparing the figures the loss of territory by the Versailles Treaty should be taken into consideration.

Fragmentary data from a few sawmills and other plants indicate that yearlong employment is given to one person for every 250 cubic meters (8,800 cubic feet) of logs sawed,<sup>14</sup> and one for every 150 cubic meters (5,300 cubic feet) of wood made into pulp. Veneer and plywood plants employ one person for every 40 to 50 cubic meters (1,400 to 1,750 cubic feet) of logs manufactured into veneer and plywood.

TABLE 25.—*Employment in wood-using industries in Germany in 1925*

Industry	Establishments	Employees	
		Total	Per establishment
	<i>Number</i>	<i>Number</i>	<i>Number</i>
Sawmills and planing mills.....	9, 209	126, 500	14
Veneer and wood preservation.....	1, 142	15, 400	14
Carpentry and interior finish.....	66, 524	203, 400	3
Furniture manufacture.....	29, 325	179, 400	6
Other cabinet work.....	6, 628	50, 600	8
Woodenware.....	18, 224	77, 300	4
Cooperage.....	14, 212	30, 100	2
Wooden boxes, crates, excelsior.....	1, 466	19, 200	13
Wooden vehicles and parts.....	38, 563	103, 800	3
Turned goods, sports equipment.....	952	7, 200	8
Canes, umbrellas, whips.....	2, 924	15, 000	5
Pencils and crayons.....	153	7, 300	48
Willowware.....	18, 264	47, 500	3
Brushes, brooms, paint brushes.....	7, 089	39, 600	5
Wood finishing.....	1, 885	5, 100	3
Pulp and paper.....	1, 151	117, 200	102
Musical instruments.....	9, 112	64, 400	7
Wooden toys.....	2, 165	10, 400	5
Miscellaneous.....	2, 415	30, 600	13
Total.....	231, 403	1, 150, 000	5

<sup>14</sup> This figure checks closely with employment in 9 State sawmills in Czechoslovakia, which normally employ 1,740 workers and saw 465,000 cubic meters of logs, or 267 cubic meters (9,425 cubic feet) per worker (8).

The numbers of establishments and persons employed in various industries in 1925, according to Dieterich (10), are given in table 25. These figures appear to be on a different basis from those given above. The small average size of establishments in most of the industries is striking. In some lines hand work predominates. This is particularly true of cabinet work, cooperage, wagon building, and basket making.

German sawmills are characteristically small. Many of them are very primitive and their output is low. Water-driven mills are common, especially in the mountains. Practically all are stationary mills; portables are virtually unknown. Many of these small mills are strictly family affairs, operated by a farmer and members of his household. The average number of employees in a sawmill in 1925 was 14, for the Reich as a whole. In Brandenburg the average was 26, in Wurttemberg only 8.

Although it is realized that greater efficiency could be attained by concentrating lumber manufacture at a relatively few large mills, this is not considered socially desirable, and it is the general policy to encourage continued operation of the small local units. In the Franconian Forest (Frankenwald) of Bavaria, for example, 105 mills saw only 19,000 cubic meters of timber a year, or an average of 181 cubic meters apiece (about 45,000 board feet). Many of these are cooperative undertakings, with the individual owners' shares about 15 cubic meters a year. If this output were all concentrated in a few larger steam mills, many persons would lose the opportunity to work for a few days or weeks and to earn the small amount of cash which enables them to retain their small farms and without which they would probably become public charges. In recognition of this fact, it is the deliberate policy of the State Forest Service to sell them the timber they need instead of selling to large-scale operators, even though this may involve a financial sacrifice.<sup>15</sup>

Similar conditions prevail in Austria, where there were, in 1930, some 5,740 sawmills, or 1 mill for every 1,350 acres of productive forest land. It has been stated that 200 fully mechanized mills with modern equipment could saw the same quantity of lumber. This, however, would reduce the number of workers from nearly 23,000 to about 6,000 and would compel thousands of families to give up their farms and join the city proletariat (17).

The idea that is prevalent in the United States, that a sustained-yield unit to supply one mill must include scores of thousands of acres, would be hardly conceivable to a forester or sawmill operator in central Europe. The Bärenfels forest in the Saxon Erzgebirge, for example, with a total productive area of about 7,500 acres, supplies the timber used by 13 permanent sawmills, besides shipping out considerable quantities of pulpwood. A small mill adjacent to the Tharandt State forest cuts about 3,500 cubic feet of logs a month, from 11 or 12 different species of timber.

Dieterich says (9):

If it is desired to prevent depopulation of the forest districts and check the growth of proletarianism, measures must be adopted to promote the timber industries of the more remote, forested portions of the country. At the same time, such a policy will best promote permanent forest management. Technical, and to some extent commercial, rationalization in this respect would point toward somewhat different goals than those indicated by sound socio-economic rationality.

<sup>15</sup> Based on unpublished official records.

He goes on to say that combination of small into large enterprises, mechanization, and concentration of industries, all of which might increase mechanical and commercial efficiency, are not sound policy for a country like Germany, because they would entail heavy sacrifice of social values.

Table 26 shows that 57 percent of the persons employed in sawmills and veneer plants in Germany in 1925 were in small- and medium-sized enterprises, which included 94 percent of the plants. It also shows that there were more large mills in northeastern Germany (East Prussia, Brandenburg) and a high percentage of small mills in the southwest (Bavaria, Baden, Wurttemberg). Small enterprises dominated most of the other wood-using industries to an even greater extent, with the notable exception of pulp and paper. Pulp and paper mills are generally fairly large.

TABLE 26.—Sawmills and certain other wood-using enterprises in Germany, 1925, classified by size of plant and total employment<sup>1</sup>

Industry and location	Small plants (1 to 5 persons)		Medium plants (5 to 50 persons)		Large plants (over 50 persons)	
	Plants included	Persons employed	Plants included	Persons employed	Plants included	Persons employed
Sawmills and veneer plants:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Prussia.....	47	5	45	48	8	47
East Prussia.....	31	3	53	41	16	56
Brandenburg.....	23	2	63	46	14	52
Westphalia.....	56	6	38	41	6	53
Rhine Province.....	60	9	33	42	7	49
Bavaria.....	68	13	29	53	3	34
Saxony.....	49	7	44	45	7	48
Baden.....	68	12	28	44	4	44
Thuringia.....	53	10	44	64	3	26
Wurttemberg.....	74	19	24	55	2	26
All plants.....	57	8	37	49	6	43
Furniture.....	79	26	19	43	2	31
Woodenware.....	89	32	10	32	1	36
Containers.....	93	41	6	27	1	32
Wagons, etc.....	96	58	4	17	1	25
Wooden toys.....	87	36	11	35	2	29
Pulp and paper.....	11	( <sup>2</sup> )	50	10	39	90

<sup>1</sup> Based on Dieterich (19). Small enterprises average 1 to 2 persons; medium enterprises average 10 to 20; large enterprises average about 100.

<sup>2</sup> Less than 0.5 percent.

Under the new planned economy it is proposed gradually to do away with existing large mills in the cities—in Berlin and Munich, for example—and establish more mills close to the forests. This will accomplish a twofold purpose: It will help to decentralize population and increase the stability of rural communities, and it will make possible closer utilization of timber and reduction of imports of foreign wood. This trend is being stimulated by regulations issued under the 1935 law for control of timber marketing (Marktordnung), which requires the permission of the Reich's Forestry Department before a new sawmill or woodworking plant may be established or an old one enlarged, or before one that has been closed down for more than a year may resume operation. One of the avowed purposes of this regulation is the gradual relocation of the industry, so that it may be better adjusted to sustained domestic supplies of timber.



Average gross wages in timber-products industries (especially carpentry and cabinet work) in 1934-35 amounted to 74.8 Rpf. an hour. Employment averaged 42.9 hours a week, so the weekly wage was RM32.09 (\$12.85). Net earnings, after deduction of tax and social insurance contributions, amounted to RM27.42 (\$11). This was lower than for many branches of industry, but higher than earnings in the paper, shoe manufacturing, and other industries which employ many women and children.<sup>16</sup>

#### TOTAL EMPLOYMENT IN FORESTRY AND FOREST INDUSTRIES

It is difficult to ascertain from the available data just how many persons are employed altogether in forestry and industries depending on the forests. Statistics of the number of persons employed in 1925 in "pure and nearly pure" forest enterprises (i. e., those with less than 12.4 acres of farm land) in Germany indicate that roughly 64 persons were employed in forest work for each 2,470 acres of forest (9). Of these, 5 were owners or members of the owners' families (mostly for the smaller units), 3 were managers, 9 were permanent laborers, and 47 were part-time workers (maximum number employed during the year). Women comprised 30 percent of the total number employed.

In the forests of Czechoslovakia it was estimated in 1926 that 227,000 workers and officials were employed (8). The area of forest and the volume of timber cut were about one-third as great as in Germany. One person was employed for every 51 acres of forest.

Endres estimates that 50 to 60 hectares (124 to 148 acres) of forest under fairly intensive management requires the equivalent of a full year's work of one person, and that transportation and manufacture of the product requires at least as much work. At this rate, if the German forests were all intensively managed (which they are not) they would give work directly and indirectly to between 400,000 and 500,000 persons (full-time equivalent).

Ortegel (29) estimates that about 1,000,000 persons were directly employed in the German forests just before the World War, or about 1 person per 34 acres. This was the equivalent of full-time employment of 200,000 persons. In addition, there were 26,000 foresters and other officials in the lower and middle grades and 4,700 higher officials, including some proprietors, practically all on a full-time basis.

According to Dieterich (9), the Prussian State forests in 1927 afforded 0.96 man-days' work for every cubic meter of timber (Derbholz) cut. At this rate, all the forests of Germany should provide about 42,000,000 days' work in normal years. He concludes that if 200 days is considered full-time employment, and if allowance is made for less intensive management of forests not belonging to the State, direct employment in the forests is equivalent to between 170,000 and 180,000 full-time workers. As the average worker is employed only 80 to 90 days a year, this means that about 500,000 different persons are employed. Besides these, there are indirectly employed some 400,000 persons (equivalent to 40,000 to 50,000 year-long), in hauling timber and other forest products; and probably more than 1,000,000 persons (equivalent to 100,000 to 120,000 full-time) are engaged part of the time in gathering twigs, berries, and mushrooms, and in peeling pulpwood and doing other work for con-

<sup>16</sup> Data from Institut für Konjunkturforschung, reported in Stuttgarter NS-Kurier, December 31, 1935.

tractors and purchasers of forest products. Some 32,000 foresters and other officials are employed practically all the time in connection with the administration and use of the forests. Dieterich estimates that the aggregate employment in producing, harvesting, and transporting forest products and in managing the forests amounts to nearly 2,000,000 different persons, equivalent to 300,000 to 350,000 on a full-time basis. This is equivalent to about 1 percent of the gainfully employed persons in Germany in 1925.

According to the 1925 census of industries, the wood-using industries, including pulp and paper, gave employment to 37 persons for every 1,000 acres of forest land in Germany. This was probably not full-time employment for all of them, and it also includes industries using imported wood. The figures ranged from about 26 persons in Bavaria and about 31 in Prussia to 49 in Wurttemberg, 53 in Thuringia, and over 150 in Saxony, which normally imports much timber from Czechoslovakia.

If allowance is made for imported wood, the industries using home-grown timber employed at least 20 persons for every 1,000 acres of forest land, or approximately twice as many as were employed in forestry, logging, and timber hauling. Altogether, the forests directly and indirectly gave employment equivalent to virtually full-time work for more than 30 persons for every 1,000 acres.

#### EFFECT OF ECONOMIC DEPRESSION ON FOREST EMPLOYMENT

Falling timber prices and reduced cutting after 1928 meant less work for the wood cutters and other laborers in the forests. Not only was the quantity of work greatly reduced in most forests, but the rates of pay also were reduced. This brought considerable hardship to the small farmers and village workers who depended on wages earned in the forests to carry them over the winter.

The Konradsdorff Forest district of Hesse is one example of the many communities that were hard hit by the decrease in forest employment (23). In 1933 this district had a population of 8,377, in 17 communes. Of the 1,788 households, 1,443 were farm units; 680 of them had less than 5 acres of land, 701 had 5 to 25 acres, and only 11 had more than 50 acres. The State forest employed 205 regular workers, most of whom owned less than 12.5 acres of land and needed the extra work. Seventy percent of the workers (144) were married and had 258 children. The average employment in 1933 was only 33 days and the average earning RM150 (about \$36). Out of this they had to pay RM20 for social insurance, RM12 for rent of land, RM40 for wood, RM13 for tax, and RM15 for clothing, leaving RM50 to spend for other things. Some firewood, grass, and litter was given away free in return for work. In the fall of 1933 many of these workers were on the relief rolls.

In most parts of Germany the attempt was made to spread employment and to take care of those in greatest need. For example, official orders of the Prussian Forest Service in 1933 provided for shortening the work-week to not more than 40 hours in 5 or 5.5 days; five 6-hour days were recommended for the winter months, and five 8-hour days for summer, with 7-hour days in early spring and late fall (20). This would permit employment of 20 percent more persons. Women were to be used on sowing, planting, and nursery work, but not on other

jobs if it could be avoided. Regular work and small emergency jobs were to be reserved for regular employees, and outside workers were to be employed only on the larger extraordinary (zusätzlich) jobs, where there were not sufficient local unemployed workers. It was proposed that hand labor be used instead of teams for working the soil on steep slopes and in other difficult places. Regular workers were to be given work the year round, so far as practical; after logging was done they were to be used for building roads and ditches and in pruning. Needy persons were to be allowed to cut firewood for their own use, but to take only small trees from thinnings, or stumps the extraction of which would not pay if done by paid labor.

The measures adopted during the last 2 or 3 years to increase the cut in German forests and reduce imports of timber have, of course, greatly increased employment of woods workers. In 1935 the cut of the State forests was raised approximately 50 percent above normal and in 1936 and 1937 this increase was also required of the other public and the private forests.<sup>17</sup> It was estimated early in 1936 that the excess cutting of the past 2 years had provided the equivalent of 6 months' work to 60,000 or 70,000 more woods workers than were employed in 1927 (31). Sawmills employed about 38,000 more persons and woodworking industries 51,000 more in 1935 than in 1932.

From 1927 to 1929 the Prussian State forests provided emergency employment amounting to 279,000 man-days (37). This was mostly planting of insect-devastated areas in the eastern provinces. In 1930-31 emergency work amounted to 87,000 man-days, and in 1932 it rose to 588,000 days. Before 1932 a large part of the workers were women from Berlin and other cities, as it was desired not to reduce the supply of farm workers; with increased unemployment in agriculture, beginning in 1932, more local people were employed.

During the year ended February 1, 1932, unemployed persons were given 720,000 steres of fuel wood, which they were allowed to cut for themselves. This helped to reduce thefts of wood, and at the same time accomplished some needed thinning that the forest administrations could not afford to pay for.

The emergency work on the State and other public forests was financed largely from relief funds appropriated for the purpose, or from unemployment insurance funds. This enabled the forest administrations to get a great deal of work done which they could not have done otherwise, owing to reduced income. The workers were recruited through the labor offices, and were frequently city industrial workers. More work could have been accomplished with the same funds if experienced workers could have been hired, without restrictions, but this would not have accomplished the objectives of the relief funds.<sup>18</sup> The expenditure, even though the work was not particularly efficient, was considered justified because the workers would have had to be supported anyway even if not employed. Moreover, it was estimated that one "free" worker was employed in making clothing, materials, and equipment, and preparing food, for every two unemployed persons given relief jobs (15). The relief workers received regular wages, contributed partly by the labor offices and partly by the forest administrations.

<sup>17</sup> Similar action was taken in 1919-20, when the Minister of National Economy ordered forest owners to cut 33 percent more than the normal cut in order to supply the deficiency resulting from loss of territory by the Treaty of Versailles. (13)

<sup>18</sup> Künanz states (23) that relief workers accomplish only 55 percent as much as experienced men.

It has been an established policy not to let relief work interfere with employment of regular forest workers. To be sure, many regular workers have been unemployed, owing to low timber prices and reduced cutting, as well as other curtailment of forest work on account of reduction in forest income. It was estimated that 120,000 to 130,000 forest workers were unemployed in 1933. Wherever such workers could be employed, they were given jobs, and in most places they were always given the preference on relief jobs, provided they were actually in need and were on the relief rolls. Many were employed as foremen and crew leaders in connection with emergency work.

According to orders issued by the chief forester of Prussia in 1933, relief projects must be supplementary (*zusätzlich*), i. e., jobs that would not ordinarily be done (20). They must be economically worth while, technically feasible, and essentially self-liquidating. They must also promote forest management. The following classes of projects were listed as appropriate:

1. Work that could not be done otherwise because of reduced funds, such as planting of cut-over areas or those denuded by insects, storms, etc.
2. Afforestation of idle land.
3. Construction of roads and similar transportation facilities which will increase future timber values and hence forest income.
4. Land improvement, where future maintenance of the improvements can be depended on.
5. Pruning of dead limbs to produce clear timber, especially of pine.
6. Fencing reproducing areas to favor the development of mixed stands and natural reproduction. Use of pole fences is recommended, in order to save costs and make use of small forest material for which the market demand is small.
7. Stand improvement, especially the substitution of good races of trees for inferior races, underplanting of open stands or those needing a hardwood understorey, and improvement cutting.

In December 1934, the permissible classes of work were increased by adding the following (1, v. 17, pp. 91-92):

- First thinnings in stands so young that they will yield no income.
- Cutting of underbrush that is hindering growth of young trees.
- Cutting of small sprouts in converting coppice to high forest.
- Binding crop trees with twigs, to protect them against peeling and rubbing by deer.
- Construction of game fences.
- Drainage and irrigation.

The importance of planning relief projects in advance has been emphasized, both in order to make the work as effective as possible and also to fit it in with seasonal employment in agriculture and other occupations. The attempt is made to use skilled workers on jobs that they can do better than unskilled workers, such as sowing and planting, nursery work, cultural operations, building of paved roads, etc. Unskilled workers are used on ordinary road building, insect control, drain construction, and construction of boundary and fire lines. An attempt is made to give each regular forest worker enough days' employment to supplement his other income, especially in the case of small landowners. This is in accord with the established policy of keeping the rural population from migrating to the cities as soon as conditions improve, and also helps to insure a stable supply of forest workers (15).

## THE AFFORESTATION PROGRAMS

Afforestation of waste land has played a major part in the relief program. This fits the specifications for such projects, in that it would not ordinarily be done with regular funds, and that it will be economically worthwhile in the long run but will return little or no income for many years. It can also be done by good-sized crews, and is work that can be learned quickly by most workers. In addition to providing work now, it also assures future employment in tending, harvesting, and utilizing the timber crops. According to one estimate (*l. v. 15, pp. 357-359*), 5 or 6 million acres could be afforested during the next 5 to 10 years, and this would require 20 million man-days' work a year, including ground preparation, planting, and other cultural work.

In 1934, approximately 100,000 acres of waste land was afforested under the so-called Reinhardt program. This included not only land in the State forests and land bought by the State for the purpose, but also land in other public forests and private land. Private owners unable to buy planting stock were given plants through the Reichsnährstand, with the proviso that they plant at their own expense a certain number of walnut trees.<sup>19</sup> It is also the policy to require that all plantations made under this program include, if possible, a mixture of species. Especial emphasis is laid on the introduction of the less common species, such as maple, ash, elm, hornbeam, chestnut, alder, birch, linden, poplar, and locust, all of which are needed by German industries. Firebreaks of broadleaf species are required in conifer plantations.

The Darré program (named after the Minister of Agriculture), which was inaugurated in 1934, followed about the same lines as the Reinhardt program (*l. v. 17, pp. 852-854; 21; 28; 30*). It was specified that State aid would be given only for the afforestation of land not suited for agriculture, including idle land, worn-out cropland, unproductive oak coppice areas (Schälwald), and forest land devastated by natural agencies such as fire, wind, or insect calamities, in cases where the owner lacked the necessary funds for reforestation. Funds were provided in four ways: (1) Contributions from the emergency employment funds of the national office for employment and for unemployment insurance (Reichsanstalt für Arbeitsvermittlung und Arbeitslosenversicherung); (2) work by the Labor Service (Arbeitsdienst); (3) loans by the Rentenbank Credit Institute (Deutsche Rentenbank-Kreditanstalt); (4) direct grants (verlorene Zuschüsse) from the national treasury. States could get aid from the first two sources, and communes and other public or quasi-public agencies from the first three. The first three agencies assisted private owners, provided a public agency acted as sponsor for the project.<sup>20</sup> Private owners could also get direct grants in lieu of the other kinds of help, provided they could not do the job with their own funds. Contributions from the employment funds might be as much as RM 3 for each man-day of employment; men were not to be worked more than 40 hours a week and were to be paid regular wages; not more than 10 percent of them could be regular employees, and 90 percent had to

<sup>19</sup> This is a striking example of long-range economic and military planning. The object is to furnish a domestic supply of high-grade wood for furniture, etc., and for future military needs (gunstocks), although obviously walnuts planted now will hardly yield such material for 60 to 100 years.

<sup>20</sup> Private owners could not get loans if they also got help from either of the first two sources.

be employed through the labor offices; 80 percent had to be taken from the relief rolls: ALU (unemployment relief, Arbeitslosenunterstützung), KRU (emergency relief, Krisenunterstützung), and WU (welfare relief, Wohlfahrtsunterstützung). It was required that the cost of the job consist largely of direct wages for labor and that the work be of a character that would not normally be done with regular workers. A forest owner was required to use his own resources as far as he was able.

Loans from the credit institute not exceeding RM 10,000 could be used to pay "free" labor, not from the relief rolls, but 80 percent had to be unemployed persons assigned by the labor offices. Interest is charged at the rate of 3 percent to public agencies and 3.5 percent to private owners. There is also a charge of 0.25 percent for administrative costs, and 2 percent for amortization beginning January 1, 1937. Provision for these credits expired in June 1936.

Projects on private land are sponsored by the forestry divisions of the organized peasantry (Landesbauernschaften), which allocate the funds provided under direct grants through the Reichsnährstand and supervise their expenditure.

The Labor Service (Arbeitsdienst) is used only when the planting project is near an established camp, or when there are enough other projects in the same vicinity to justify setting up a camp. It has been estimated that afforestation of 1,700 acres will require 50,000 days' work and will employ a standard camp of 216 men for a year, working 36 hours a week.<sup>21</sup> Where the Labor Service is used, the owner is expected to pay a small sum per man per day, and also to pay the salaries of forester and foremen and provide tools and materials.

During the 4 years ended with 1935, at least 43,200 acres was afforested by emergency workers and Labor Service men in Silesia alone (*l. v. 17, p. 1145*). In Prussian Saxony 18,000 acres of private forest, in at least 2,000 separate tracts, was afforested in 1935 under the Darré program. In this region much of the work was done under the stimulation of numerous afforestation societies or cooperative organizations (*l. Deut. Forstbeamtzg, p. 550*).

#### THE LABOR SERVICE

The German Labor Service (Reichsarbeitsdienst) has evolved from the more or less unorganized work camps for young men that sprang up soon after the World War. In the beginning these were sponsored by all sorts of public and private agencies and were primarily for the purpose of giving employment to the needy. Many were "open" camps, i. e., the men lived at home and received nominal wages which helped the family finances. In Hesse, for example, the allowance was RM 1.60 a day (\$0.38). Later, the work was put on an organized basis and "closed" camps became standard. The workers lived in the camps, received subsistence and work clothes and an allowance of 20 to 30 pf. a day (8 to 12 cents at present rate of exchange). There was an average enrollment of 228,000 men in the camps in 1933 and 1934. In 1935 the number was set at 200,000, including leaders, and the term of service at 6 months.

In 1935 the Service, which had been on a voluntary basis (Freiwillige Arbeitsdienst), was made compulsory in theory for every German

<sup>21</sup> It is not clear how this works out, for of course planting cannot be carried on throughout the year. Much of the work, however, can be done at almost any time—for instance, preparation of the ground, cultural operations following the planting, building of game fences, etc.

citizen between the ages of 18 and 25.<sup>22</sup> The relief phase, therefore, is no longer important. It is unnecessary here to go into detail as to the social and political objectives of the Labor Service. It has important economic objectives, in which forestry has a part. These objectives are to increase the productivity of the German territory and to promote the redistribution of population in such a manner that all of the national resources may be utilized to the best advantage. Of the work accomplished up to the middle of 1935, about 60 percent, measured in man-days, was in improvement of agricultural land, including drainage, irrigation, clearing of stumps and rocks, and reclamation of land from the sea. About 15 percent was road construction, 5 percent establishment of new settlements, and 10 percent miscellaneous. Only 10 percent was forestry work (18).

Projects to be undertaken by the Labor Service are supposed to meet certain requirements (19):

1. They must be of public benefit.
2. They must be self-liquidating; i. e., there must be prospect that the benefits sooner or later will at least balance the costs.
3. They must require relatively small capital investment in proportion to the amount of labor required.
4. The work must be fairly simple, so that it can be learned easily; there must be some variety to it; and it must be suitable for men working in crews.
5. Projects must be such that they can be started or dropped at any time, and work must be practical during most of the year.
6. There must be enough work in one place to justify setting up a camp, without having to spend too much time in travel to and from work; projects must be well distributed geographically.
7. The work must generally be of a kind that would not ordinarily be done by regular workers.

Some kinds of forest work meet these specifications admirably. Kinds that are considered especially suitable for the Labor Service are afforestation of idle land, reforestation of extensive denuded areas (not ordinary reforestation following cutting), construction of forest roads (beyond the ordinary forest budget), improvement of pastures and meadows, pruning, and extraction of resin. Regular planting and construction work is reserved for the regular workers, as is timber cutting. The Labor Service is sometimes used to make thinnings in young stands, where the cost of the work cannot be recovered from the sale of the material removed.

A considerable amount of work in one locality, either a large project or many small ones, is necessary to justify establishment of a Labor Service camp. The camps normally contain 216 men, including leaders, and figure on about 50,000 man-days work a year. Owing to the overhead cost of buildings and equipment, which are provided by the Forest Service where jobs are on the State forests, it is the policy to prefer projects that will require 2 or more years' work from one camp (20, v. 15). It seems to be agreed that the young men in the Labor Service, although willing, cannot accomplish nearly as much work as experienced forest laborers. Thalau (37), for instance, estimates that their work is 90 to 100 percent as good as that of regular workers, but that they do only 60 to 70 percent as much. He and other writers (19, 23) agree that the work could be done more cheaply by regular workers at regular wages, but that the moral, physical, and social benefits to the young men far outweigh the greater cost.

<sup>22</sup> It was made compulsory in 1933 for college students and all persons who intended to enter the public services.

Furthermore, from the standpoint of the State Forest Service or other forest owners, the work is cheap, because they put up only part of the cost—generally quarters, tools and equipment, technical supervision, and a small cash contribution per man per day.

From the beginning, the Labor Service has carried on projects on both public and private forests. Projects on private land have to be approved and sponsored by some public or quasi-public agency, such as a commune or, usually, the local agency of the Reichsnährstand, the national farm organization. They must involve work that the owner would not and could not do with his own resources, and must be directed primarily toward benefiting the public rather than the private owner. He is expected to pay as much of the cost as he can. The policy in the last year or two has been to work mostly on public lands.

### SUMMARY AND CONCLUSIONS

In central Europe generally, and in Germany particularly, securing of the economic and social stability and well-being of the rural population is definitely regarded as a major objective of forest-land management.

Forests managed so that they are continuously productive afford a large volume of work, which recurs more or less regularly, year after year.

Forest work, much of which can best be done between late fall and early spring, is especially suitable for supplementing farm work and other rural employment. It is the major source of cash income for large numbers of small farmers, especially in those parts of the country where there are few other opportunities for outside employment.

Besides the regular work required to operate the forests and utilize their products, the development and improvement of forests affords a huge reservoir of opportunities for socially useful emergency employment.

The experience of Germany and other countries of central Europe demonstrates the advantage, from the social standpoint, of having forests and forest industries widely distributed and in close proximity to rural settlements. When that is the case, it is possible to have a settled force of permanent workers, living in their own homes and making their living partly from the forest and partly from their farms or other occupations. Such workers are likely to take a keen interest in maintaining the productivity of the forest.

Large-scale mass production may be less desirable, from the social standpoint, in forestry and most of the forest industries, than production in relatively small and widely scattered units. Incidentally, production in small units is usually better for the forest, because it is less likely to involve excessive cutting over large areas.

Woods work in Germany affords employment at the rate of one person fully employed for approximately 100 acres of productive forest land. Several times as many are actually employed, on a part-time basis. Manufacture, processing, and distribution of forest products employ perhaps twice as many persons as forestry and logging.

It is not likely that the forests of the United States, which has 4 acres of productive forest land per capita of population, can in the near future provide employment at anywhere near the same rate as



those of Germany, which has less than one-half acre per capita. Nevertheless, after making due allowance for differences in intensity of management, there is ample reason to believe that our forests can continue indefinitely to support many millions of people and serve as a mainstay of rural life in many regions. They can do this only if they are managed for continuous production and in proper correlation with the agricultural land and other natural resources in their vicinity.

## LITERATURE CITED

- (1) ANONYMOUS.  
1933-36. [UNSIGNED NOTES.] Deut. Forstwirt 15: 357-359, 639, (1933); 16: 520, 607, 628, 676, 743, 804, 806, 924, 970, 996, 1019, 1032, 1067, 1119-1120, (1934); 17: 23, 91-92, 189, 192, 206, 232, 428-429, 537, 852-854, 901, 953-954, 1145, 1186, (1935); 18: 118, 169, 210-211, (1936); Deut. Forstbeamztg. 1: 469-470, 475, 550, 1935.
- (2) \_\_\_\_\_  
1935. DAS ERSTE JUNGARBEITERLEHRLAGER DEUTSCHER WALDARBEIT. Tharandter Forstl. Jahrb. 86: 342-344. (Article signed Hs.)
- (3) \_\_\_\_\_  
1935. SCHULUNGSPLAN DER BADISCHEN LANDESFORSTVERWALTUNG FÜR FORSTARBEITER IM JAHR 1935. Allg. Forst u. Jagd Ztg. 111: 323-324.
- (4) AUSTRIA FEDERAL FORESTS.  
1927-33. JAHRESBERICHT DER ÖSTERREICHISCHEN BUNDESFORSTE.
- (5) BAVARIA STATE FOREST SERVICE.  
1913-34. FORSTSTATISTISCHER JAHRESBERICHT DER BAYERISCHEN STAATSFORSTVERWALTUNG. Staatsministerium der Finanzen, Ministerial-Forstabteilung.
- (6) \_\_\_\_\_  
1934. ARBEITSORDNUNG DER BAYERISCHEN STAATSFORSTVERWALTUNG. Finanz Ministerialblatt f. d. Freistaat Bayern 15 (19 Dezember 1921), with amendments through 1933.
- (7) BRUNSWICK STATE FOREST SERVICE.  
1929-33. MITTEILUNGEN ÜBER DIE WIRTSCHAFTSERGEBNISSE DER BRAUNSCHWEIGISCHEN FORSTVERWALTUNG.
- (8) CZECHOSLOVAKIA MINISTRY OF AGRICULTURE.  
1926. SYLVICULTURE DANS LA RÉPUBLIQUE TCHÉCOSLOVAQUE. Tchécoslovaque Min. d'Agr. Pubs. 1926, No. 66, 318 pp., illus. Prague.
- (9) DIETERICH, V.  
1932. DIE AUSWERTUNG DER REICHSSTATISTIK ZUR KENNZEICHNUNG DER FORSTLICHEN VERHÄLTNISSE DEUTSCHLANDS. Silva 20: 265-271, 273-278, 297-304, 305-309, 321-328, 329-334, 345-350, 353-358, 361-365.
- (10) \_\_\_\_\_  
1933. STATISTISCHE GRUNDLAGEN UND METHODEN EINER FORSTWIRTSCHAFTLICHEN STANDORTSKUNDE. II. DIE NACHFRAGESEITE DER HOLZMARKTES. Silva 21: 257-269, 273-279, 297-392, 305-311.
- (11) \_\_\_\_\_  
1936. WALD-FORSTWIRTSCHAFT-LANDESPLANUNG. EIN WEITERER BEITRAG ZUR WIRTSCHAFTLICHEN STANDORTSKUNDE. Silva 24: 267-277, illus.
- (12) EBERTS, H.  
1933. ERHALTUNG DES WALDARBEITERBERUFSTANDES. Deut. Forstwirt 15: 137-141, 145-147, 149-151, 153-156.
- (13) GLESINGER, E.  
1932. LE BOIS EN EUROPE; ORIGINES ET ÉTUDE DE LA CRISE ACTUELLE. 734 pp., illus. Paris.
- (14) GRUENEBERG.  
1908. DIE ARBEITERVERHÄLTNISSE IN DEN STAATSFORSTEN DES HANNOVERISCHEN HARZES IN VERBINDUNG MIT DER GRÜNDUNG UND ENTWICKLUNG DER FORSTARBEITERUNTERSTÜTZUNGSKASSE ZU CLAUSTHAL. Ztschr. Forst u. Jagdw. 40: [481]-505, [551]-571.

- (15) HARTMANN AND PISTOR.  
1934. NOTSTANDSARBEIT. Deut. Forstwirt 16: 921-922.
- (16) HEINZE.  
1935. TECHNISCHE WALDARBEITERSCHULUNG IN SACHSEN. Deut. Forstwirt 17: 925-928.
- (17) HESKE, F.  
1935. DIE FORSTWIRTSCHAFT ÖSTERREICHS. Ztschr. Weltforstwirtschaft 3: 1-80, illus.
- (18) HIERL, K.  
1935. [SPEECH REPORTED IN DAILY PAPERS.] Leipziger Neueste Nachrichten, September 16.
- (19) HILF, H. H.  
1932. ARBEITSGESTALTUNG IN NOTZEITEN. Deut. Forstwirt 14: 599-601, 607-609, 613-616.
- (20) KEUDELL, VON.  
1933-34. [OFFICIAL NOTICE.] Deut. Forstwirt 15: 569, 1933; 16: 339-340; 548, 1934.
- (21) ———  
1935. DIE WEITERFÜHRUNG DES NATIONALEN AUFFORSTUNGSWERKS. (Abstract) Forstwiss. Centbl. 57: 676-677.
- (22) ———  
1935. [LETTER OF SEPTEMBER 13 TO STATE FOREST SERVICES.] Deut. Forstwirt 17:
- (23) KÜNANZ, H.  
1933. DIE ARBEITSBESCHAFFUNG IN DER FORSTWIRTSCHAFT. Deut. Forstwirt 15: 593-597, 601-604, 609-612.
- (24) LEMMEL.  
1935. DIE WIRTSCHAFTSERGEBNISSE DER PREUSSISCHEN STAATSFORSTVERWALTUNG IM JAHR 1934. Mitt. Forstwirt. u. Forstwiss. 6:537-620, illus.
- (25) MANTEL, K.  
1934. DIE NEUGESTALTUNG DER NATIONALEN ARBEIT IN DER FORSTWIRTSCHAFT. Deut. Forstwirt 16: 353-355.
- (26) ———  
1934. DER NEUAUFBAU DER SOZIALVERSICHERUNG IN DER FORSTWIRTSCHAFT. Deut. Forstwirt 16: 594-595.
- (27) ———  
1935. DIE ORDNUNG DER NATIONALEN ARBEIT IN DER WALDWIRTSCHAFT. In Wappes, L., Wald und Holz, Bd. 2, pp. 1321-1329. Neudamm and Berlin.
- (28) ———  
1935. DAS DEUTSCHE FORST-UND HOLZWIRTSCHAFTSRECHT. In Wappes, L., Wald und Holz, Bd. 2, pp. 1331 ff. Neudamm and Berlin.
- (29) ORTEGEL, R.  
1927. DIE FORSTWIRTSCHAFT. LAGE UND AUFGABEN IN DER DEUTSCHEN VOLKSWIRTSCHAFT. Aufl. 2, 95 pp. Neudamm.
- (30) PARCHMANN, W.  
1935. DAS NATIONALE AUFFORSTUNGSWERK IM JAHRE 1935-1936. Deut. Forstwirt 17: 481-484.
- (31) ———  
1936. ZUM 29. MÄRZ. Deut. Forstwirt 18: 290-292.
- (32) RAAB, F.  
1931. DIE DEUTSCHE FORSTWIRTSCHAFT IM SPIEGEL DER REICHSSTATISTIK; AUF GRUND DER ÄMTLICHEN QUELLENWERKE . . . 182 pp., illus. Berlin.
- (33) SCHWAPPACH, A.  
1918. FORSTWIRTSCHAFT. In Braun, F., Edler, von, Dade, H., and associates, Arbeitsziele der deutschen Landwirtschaft nach dem Kriege, pp. 891-904. Berlin.
- (34) ———  
1927. FORSTVERWALTUNG. In Lorey's Handbuch der Forstwissenschaft, Aufl. 4, Bd. 3, ch. 16. Tübingen.
- (35) SCHWERDTFEGER, F.  
1936. KULTURSCHÄDLINGE UND FORLEULENFRASS. Ztschr. Forst u. Jagdw. 68: 653-660, illus.

- (36) SIEBERT.  
1935. [ADDRESS AT MEETING OF DEUTSCHER FORSTVEREIN.] In Wurzburger General-Anzeiger, August 27, 1935.
- (37) THALAU.  
1933. DIE AUSFÜHRUNG VON ARBEITEN IN DEN PREUSSISCHEN STAATSFORSTEN IN KRISENZEITEN. Deut. Forstwirt 15: 69-71, 73-76, 85-88.
- (38) TREITSCHKE, K.  
1928. DIE WIRTSCHAFTLICHEN UND SOZIALEN VERHÄLTNISSSE DER PREUSSISCHEN STAATSFORSTARBEITER. Deut. Landarbeitverbandes, Schrift No. 21, 247 pp. Berlin.
- (39) WAGNER, C.  
1935. GRUNDLEGUNG EINER FORSTLICHEN BETRIEBSLEHRE; EIN LEHRBUCH FÜR THEORIE WIE PRAXIS. 337 pp. Berlin.
- (40) WALKENHORST.  
1934. SIEDLUNG IM FORSTBETRIEBE. Deut. Forstwirt 16: 955-957.
- (41) WÜRTEMBERG STATE FOREST SERVICE.  
1929-32. FORSTSTATISTISCHE MITTEILUNGEN AUS WÜRTEMBERG.

## APPENDIX

## EXAMPLES OF EMPLOYMENT AFFORDED BY MANAGED FORESTS IN GERMANY

1. A city forest of 6,200 acres in Württemberg. Spruce and fir, with some pine. Annual cut about 530,000 cubic feet. Forest officers (including office force), 8. Permanent workers, 60, employed practically yearlong. These are mostly skilled woodsmen and get about \$2.40 a day (RM 6). The forest partially supports 60 to 70 small sawmills and other wood-using industries, besides considerable home industry (hand work).

2. A State forest of 7,000 acres in Saxony. Spruce, pine, and some hardwoods. Forest officers, 7. Permanent (yearlong) workers, 15. Numerous temporary workers (number not known).

3. A private forest of 60,000 acres in Prussia. Pine (mostly poor soil and relatively light stands). Annual cut 2,475,000 cubic feet. Forest officers (including office force), 54. Permanent workers 360 (not all yearlong). Besides these, there are 25 officials and 324 workers in sawmills and pulp and paper plants. Mills saw only part of the sawlogs produced on the property, but the pulp mills get part of their wood from other forests. The owner estimates that about 30 hectares (74 acres) of this kind of forest will furnish a full year's work for one person, in woods and mills. Approximately 2,200 persons, including dependents, gain their living from work in the forest and the industrial plants connected with it.

4. A 12,500-acre forest in Baden, owned jointly by the State and individuals. Spruce and fir, with some pine and beech. Annual cut 1,340,000 cubic feet. Foresters, etc., 12. Permanent workers, 206, practically full time.

5. A unit including State and communal forests of 11,100 acres in Baden. Spruce, fir, pine, and hardwoods. Foresters, 19. Workers, 600, averaging about 3 months' employment.

6. A private forest of 2,200 acres in Anhalt. Pine. Annual cut 160,000 cubic feet. Foresters, 2 to 3. Permanent workers, 5 to 10. Temporary workers, 20 to 25, for 4 to 6 months.

7. A State forest of 7,500 acres in Saxony. Spruce, fir, and beech. Annual cut 475,000 cubic feet. Foresters, etc., nine. Permanent workers, 52; semipermanent, 15 (4 to 6 months). About 80 women employed during planting season (3 to 4 weeks). Thirteen sawmills get their timber from this forest.

8. A city and hospital forest of 2,200 acres in Saxony. Spruce. Annual cut 97,000 cubic feet. Foresters, three. Permanent workers, 10, besides 40 women for 3 to 4 weeks during the planting season.

9. A private forest of 10,500 acres in East Prussia. Spruce, mixed hardwoods, and pine. Annual cut about 1,100,000 cubic feet (normal cut 860,000 cubic feet). Employs 200 workers for 4 months (November to February), and about 50 during the rest of the year.

10. A State forest of 10,400 acres in East Prussia. Spruce and hardwoods, some pine. Annual cut 880,000 cubic feet. Employs 200 to 210 workers for 6 to 9 months. Workers are all farmers, mostly with 5 to 7 acres of farm land; a few have 25 to 30 acres. Six sawmills get timber from the forest, and there is considerable home industry, making grain shovels, baskets, and handles.

11. A 13,000-acre State forest in East Prussia. Pine. Annual cut 1,130,000 cubic feet (normal cut 635,000 cubic feet). Has 100 yearlong workers. At least as many are engaged part of the year in hauling timber. Two villages with 250 to

300 inhabitants depend entirely on forest work. The soil is so poor that a family cannot make a living on 60 acres of cultivated land. Most of the forest workers have 3 to 5 acres of land; all keep geese and a few have goats, cows, or horses.

12. Another 13,000-acre State forest in East Prussia. Pine. Annual cut 1,235,000 cubic feet (normal cut 935,000 cubic feet). Foresters, 9 to 10. Laborers, 50 year long (about 11 months); about 150 for 4 to 5 months (now 6 months owing to abnormal cutting). These part-time workers are mostly building workers rather than farmers, although most of them own small fields or lease them from the State. Most of them raise their own potatoes and vegetables, and many keep cows, which are pastured in openings in the forest.

13. A 12,000-acre State forest, also in East Prussia. Pine. Annual cut 675,000 cubic feet. Employs 120 workers for 8 months.

14. A 10,000-acre State forest in East Prussia. Pine. Annual cut 560,000 cubic feet. Employs 60 workers for 5 months and a few throughout the year.

15. A 5,500-acre State forest in Bavaria. Spruce, hardwoods, and pine. Employs 26 year-long workers, 43 temporary laborers for an average of about 3 months, and about 30 women for 4 to 6 weeks in planting and weeding (cleaning) plantations.

16. A 220-acre communal forest of hardwoods and spruce, in Wurttemberg. Annual cut 7,200 cubic feet. Operation of this forest requires 200 to 300 man-days of work a year, which is divided among the 30 families owning the forest. Workers receive M3 (\$1.20) a day, and as owners share in the net income from the forest.

17. A 3,500-acre State forest in Saxony. Spruce, pine, and hardwoods. Annual cut 140,000 cubic feet of stem wood, or 176,000 cubic feet including branch wood. Foresters and office staff, four. Permanent workers, 17; temporary workers, 48 women.

18. A 3,700-acre State forest in Wurttemberg. Beech (53 percent), spruce (36 percent), miscellaneous hardwoods and conifers. Annual cut about 260,000 cubic feet; plant about 50 acres a year. Six or seven foresters, etc.; these have to supervise management of 2,400 acres of communal forests and 570 acres of private forests, in addition to managing the State forest. State forest alone employs 102 workers, a few of them practically full-time, but most of them only during the winter (at least 3 months). Many are carpenters, bricklayers, or other village workers, and most of them own small subsistence farms.

#### EXAMPLES OF EMERGENCY WORK UNDER RELIEF PROGRAMS IN GERMANY

1. Adenau communal forest (Prussia). Converted 750 acres of oak coppice by planting conifers; built 2.36 miles of new road and improved 7.9 miles of old road; cleared 30 acres of State forest land for agricultural use. Enough wood was cut from the coppice area to pay for the cost of cutting it, and the timber from the cleared land nearly covered the cost of clearing (the land was subsequently rented for \$10 to \$18 an acre). These projects required 50,141 days' work (6¾ hours) by emergency workers and 5,625 man-days by the Labor Service, all in 1934. Emergency workers received 45 pfennigs (18 cents) an hour. (*1, 16: 924.*)

2. Linichen forest (Prussia). Prepared soil and planted areas defoliated by insects, did intensive cultural work in young plantations, and sprayed plantations against leaf-cast fungus. In 1932 employed 58 relief workers for a total of 2,154 days; in 1933, 42 workers for 4,247 days; and in 1934, 16 workers for 722 days. This freed the surrounding communities of unemployment. The labor office contributed toward the cost at the rate of RM 3 per man per day. (*1, 16: 628.*)

3. Grimnitz forest (Prussia). In 1934, up to October 31, employed relief workers to the extent of 4,750 man-days and "free" workers 700 days on road construction. This took care of all local unemployment (*1, 16: 1067*).

4. Freienwalde forest (Prussia). In winter of 1933-34 employed 40 to 50 relief workers for 3,040 days on soil improvement and cultural operations, pruning, and road building. Built one-half mile of road to open up timber hitherto inaccessible. Two communes in the district employed 150 men getting out stone from their forests for road building (*1, 16: 996*).

5. Communal forest district of Wittlich (Prussia), embracing the forests of 14 communes. Employed about 100 persons for 5 months (11,460 man-days) in converting and planting 97 acres of coppice forest, release cutting (weeding) on 700 acres, and construction of 3.54 miles of new road (*1, 16: 607*).

6. Grohnde forest (Prussia). In fiscal year 1933 employed 187 workers for 16,000 days, besides many of their teams, all on road construction and maintenance. This kept several communities free from unemployment for several

months. Part of the cost was covered by contributions from the State labor office and the Reich relief fund. More work was given to regular workers by increasing the cut from a normal of 19,000 cubic meters to 24,000 in 1933 and 29,000 in 1934, and by shortening hours during the winter to spread work. This increase in cut was mostly inferior material, the removal of which improved the forest. Work was confined mostly to fall, winter, and early spring, because farm workers were needed in summer in that locality (*1, 16: 628*).

7. Luneburg district, including eight State forests (Prussia). From February to July 1934, planted 940 acres of waste and insect-devastated land, at a cost of RM 88,000 (about \$35,000). The Forest Service put up only RM 4,000; the national office for employment and for unemployment insurance contributed RM 47,000, the Labor Service RM 9,000, and RM 28,000 was borrowed from the Rentenbank Credit Institute. The project made 16,000 days' work for relief workers, 5,000 days for Labor Service enrollees, and 2,000 for local forest workers (*1, 16: 1119-20*).

8. In Pomerania, the provincial farm organization (Landesbauernschaft) appealed to landowners in 1934 to make work by afforesting land unsuitable for agriculture. During the ensuing 3 months 200 owners of medium and large tracts and 1,500 small farmers afforested approximately 7,500 acres, filled in blanks on 620 acres additional, did cultural work on 620 acres, and stand improvement on 5,000 acres. The small farmers did the work themselves, using plants provided free of cost by the organization, but the larger owners employed some 5,000 persons from the relief rolls and 200 regular workers for about 13 weeks. The cost of 350,000 days' work was contributed by the employment office (*1, 17: 206*).

During the preceding 22 months, 360 emergency projects and 127 supplementary projects for work on private forests were approved. These called for employment of 11,200 relief workers for an average of 26 weeks and 600 "free" workers, or for twice as many persons for 13 weeks. The total employment was estimated at 1,772,000 man-days, and the cost about 7,138,000 marks (\$1,700,000 at the rate of exchange prevailing in 1932-33), of which the Reich was to contribute approximately three-fourths. The work projected included: Afforestation of 13,000 acres of waste land and moor, reforestation of 28,600 acres of land denuded by fire, insects, etc., underplanting of 1,015 acres, cultural work on 1,910 acres, release cutting (weeding) and pruning on 12,000 acres, land improvement on 1,120 acres, clearing of 215 acres, and insect control on 550 acres (*1, 16: 743*).

9. The Betzdorf district (Prussia) has a dense industrial population and had much unemployment. There are large areas of coppice forest, owned by communes and associations, that need to be converted to timber forest. There is also great need for increasing the agricultural area by clearing any land that is suitable, and also an urgent need for better roads. Over 3,500 workers were given employment; first, members of the Labor Service, and since 1933, persons from relief rolls. The district (Kreis) and communal governments paid the social-insurance fees, the salaries of technicians and foremen, and workers' wages in excess of RM 2.50 per man-day (about \$1) advanced by the Reich. Landowners benefiting by the work furnished the necessary tools. In 10 months, 500 acres of land was cleared for agriculture, 410 acres of coppice was converted by planting, cultural operations were performed on 635 acres of plantations, and 37.2 miles of road was built, of which 12.4 miles was surfaced (*1, 17: 232*).

10. In the winter of 1934-35, some 2,000 persons in the toy-making district of the Saxon Erzgebirge were employed in making 5,000,000 small hand-carved wooden tags used in collecting funds for winter relief. In this way, these persons who were unemployed because of the depression in the toy industry were enabled to earn an average of RM 100 apiece. Unemployed wood carvers in Baden were helped in a similar manner (*1, 16: 1019, 1032*).

11. A group of 13 State forests in the Luneburg district (Prussia), with an aggregate area of 190,000 acres, employed 600 emergency workers during the year ended September 30, 1935, for a total of 37,530 days. The total cost was about \$60,000, of which two-thirds was contributed by the labor office. The accomplishments included 28 miles of new road or surface on old roads, soil improvement on 320 acres, cultural operations on 175 acres, cleaning 370 acres of plantations, pruning of 960 acres, cleaning of 15.7 miles of ditch, building of 6.2 miles of firebreaks and 11.7 miles of game fence, and 25 miles of boundary ditch (*1, 18: 118*).

12. The 20 State forests comprising the Schneidemühl district (Prussia), with a wooded area of about 310,000 acres, provided 262,500 man-days of emergency work during 15 months ending with December 1934. Accomplishments included:

Construction or reconstruction of 125 miles of roads, construction of 7.5 miles of ditches and cleaning of 98.6 miles of old ditch, drainage of 125 acres of meadows, construction of 35 miles of game fence, sowing or planting of 3,135 acres, preparation of 440 acres for planting, cultural work (weeding, insect control, etc.) on 7,050 acres of plantations, stand improvement on 560 acres, pruning on 320 acres, and quarrying of 18,400 cubic yards of rock for road building. During the first 9 months an average of 840 workers were employed, and during the last 6 months 490, of whom about 50 were unemployed persons from Berlin (1, 16: 628; 17: 192).

13. The Köslin district of Prussia, with 251,300 acres of woodland in State forests, gave 1,070,000 man-days of emergency work between April 1933 and September 1935, inclusive. In each of the 3 years, 1,300 to 1,500 emergency workers, 750 to 960 "free" workers, and several hundred Labor Service enrollees were employed, most of them for 150 to 180 days a year. Besides local unemployed, about 100 were brought from Berlin. The total cost of the program was approximately 4,500,000 marks (about \$1,600,000), of which about one-third came from the regular forest funds and slightly more than two-thirds from various relief funds. Accomplishments included: 12,400 acres of new plantations, 8,030 acres of supplementary planting (to fill blanks, etc., in earlier plantings), 36,200 acres of cultural work in plantations, 4,600 acres pruned, 3,000 acres of land improvement, 465 miles of roads built or improved, 273 miles of drainage ditches built, and 45 miles of game fence constructed (1, 17: 23; *Deut. Forstbeamtztg.* 1: 550).

14. The Brunswick State forests (about 187,000 acres) normally provide about 319,000 man-days of work a year. Since 1933 much additional work was given to unemployed persons, especially during the winter. During the year ended with September 1934, such extra employment amounted to 95,000 man-days, most of which was on road building to increase the value of the forest. Still more work was planned for 1935 (1, 17: 189, 192).

15. The 260,000 acres of State forest in the Königsberg-West Prussia district of eastern Germany provided about 750,000 man-days of work during each of the years 1933 to 1935. About half of it was emergency work, which cost altogether more than 4,000,000 marks (about \$1,400,000), nearly all from the special emergency funds and the unemployment funds of the Reich. Accomplishments included: 466 miles of road built or improved, 37 miles of game fence built, several hundred acres pruned, 15,500 acres planted, and 47,000 acres drained (1, *Deut. Forstbeamtztg.* 1: 475).

16. The Merseburg district, embracing about 180,000 acres of Prussian State forests, in 1933-34 employed about 1,000 emergency workers for 72,000 days' work, largely road building and afforestation (1, 16: 804).

17. The 34 State forests in the Allenstein district of East Prussia, with a wooded area of about 485,000 acres, provided more than 800,000 man-days of emergency work during the 14 months ended with May 1934. Part of the time as many as 5,000 workers were on the job, including both local people and many from the larger cities. The local men lived at home, the others in camps. Workers were paid 3.20 marks (about \$0.76) for an 8-hour day. The work was financed by grants from the Reich's labor department and by loans. A great variety of work was done, including: Cutting timber, building roads, planting and cultural work, disease and insect control, flood control works, drainage, stream and ditch clearing, pasture improvement, fertilizing, release cutting, pruning, marking diseased trees, construction of game fences, tarring buds to prevent browsing, marking of boundaries, construction of fire lines and bridges. Experienced workers were used as foremen, but the accomplishments as a whole were considerably below what would have been done by regular forest workers (1, 16: 676).

18. The Minden-Münster forest district, with 61,000 acres of forest, employed 345 emergency workers for a total of nearly 31,000 days in the fiscal year 1935. Many of these were industrial laborers from the cities. The State labor office contributed RM 2.50 (\$1) a day for local unemployed workers, and special arrangement was made for the city workers, all of whom were married and had to have private quarters (1, 18: 210).

19. In the State forests of Schleswig-Holstein, considerable work was done by the Labor Service in 1934, in addition to the regular work carried on by "free" laborers. Many unemployed persons were also allowed to supply themselves with firewood, which they paid for by working in the forests. Besides these, 482 emergency laborers were given an aggregate of 22,150 days' employment. They planted 200 acres of idle land; prepared the ground for later planting on 60 acres; made a release cutting of 100 acres of suppressed spruce; cleaned and deepened 21 miles of drainage ditch; built 24 miles of game-proof fence around plantations; and improved or constructed 9.4 miles of timber-extraction roads (1, 16: 743).

## VOLUME OF EMPLOYMENT IN AUSTRIAN FORESTS, WORKING CONDITIONS, AND WAGES

The total area of Austrian State forests (4) is slightly more than 1,800,000 acres, but only 800,000 acres is classed as commercial timberland. The average annual cut during the period 1927-31 was approximately 44,000,000 cubic feet. The numbers of persons employed at various times since 1927 are shown in table 27.

TABLE 27.—Persons employed in the State forests of Austria, 1927-31

Year and month	Administrative		Laborers			Total laborers per 1,000 acres	
	Technical and protection staff	Clerical and other	Statutory		Free	Commercial forest area	Gross area
			Perma- nent	Nonper- manent			
1927-April.....	1 807	(1)	<sup>2</sup> 1, 076	(2)	2, 787	4. 8	2. 1
1928-June.....	661	141	983	464	2, 300	4. 7	2. 1
1929-December.....	589	204	902	395	2, 500	4. 7	2. 1
1931-December.....	527	230	724	377	1, 913	3. 8	1. 7

<sup>1</sup> Technical and clerical employees not given separately for 1927.

<sup>2</sup> Permanent and nonpermanent workers not given separately for 1927.

The number of workers employed by the State per unit of area is smaller in Austria than in Germany, partly because in Austria only about half of the timber cut from the State forests is cut by the State workers. About 30 percent is sold on the stump and cut by the purchasers, and 20 percent is cut by holders of timber rights (servitudes).

In Austria, forest laborers are classed as "statutory" or "free." The former, who are found in only two provinces, have legally established rights to employment in the State forests when work is available. They include permanent (ständige) workers, whose right to work is irrevocable, although they cannot demand full-time employment, and nonpermanent (unständige) workers, from whom the right can be withdrawn, but who enjoy the same arrangements with respect to insurance, wages, and terms of employment as the permanent workers. The free workers work under agreements drawn up in the spring of each year.

Wages in Austria, at least until recently, have been comparable to those in Germany (4). The average daily wage for forest workers in 1913-14 was S. 3 (\$0.71), or about the same as in Bavaria. In 1931 the average was S. 6.40 (\$1.52). Wages ranged from S. 4.4 (\$1.05) for an 8-hour-day planting, to S.6.8 (\$1.62) for a 10-hour-day logging. There is also some variation according to region; for instance, wood cutters in Lower Austria got S. 6.63 a day in 1930, and those in the Tyrolean Alps S. 8.84. Wages in private forests are lower than those in State forests.

In Austria the "statutory" workers get old-age pensions and allowances for sickness without any contribution on their part (4). In some places they also receive free medical treatment. The cost amounts to about S. 3,000,000 a year (about \$700,000). In July 1928, there were 2,432 pensioned workers or widows and orphans of workers. The average age of the men was 59 years and their average length of service 31 years (maximum 50 years). Their average pension was S. 121 (\$28.80) a month. Widows received an average of S. 66 (\$15.70), and orphan children S. 20 (\$4.76). In December 1931 there were on the pension rolls 1,957 men, 567 widows, and 46 orphans. The total number of statutory workers actually employed in 1928 was 1,427 and in 1931, 1,101. There were approximately twice as many pensioners as active workers.

Examples of employment afforded by managed forests in Austria are as follows:

1. A State forest of 10,000 acres (forest land only) in Austria. Spruce, beech, and some pine. Annual cut 880,000 cubic feet. Foresters, etc., 11. Permanent workers, 16; temporary workers, 23 (4 to 5 months).

2. A State forest of 16,000 acres in Austria. Spruce, beech, and some pine. Annual cut 1,400,000 cubic feet (normal cut 1,125,000 cubic feet). Foresters, 10. Permanent workers, 26; regular part-time workers, 63; occasional workers, 30. Numerous small mills draw their logs from this forest.

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