

rise above this zone, but the conditions of the soil in Germany permits of trees growing everywhere. Even in the barest parts, in the sandy parts of plains, and on the shallow earth of mountains, the hardier species of timber, especially fir and pine trees, find sufficient inducement to thrive. Thus, in the course of centuries, the actual distribution has been fixed by artificial influences such as density of population, growth of property, legal conditions, and the development of industry and traffic. Fewer forests are to be found in districts where the soil is level and fertile, and consequently devoted to agriculture, or where the population is denser and traffic more extensive than in districts scarcely populated and with uneven, barren soil.

Three Chief Timber Districts.

Setting aside the political division of the empire into 26 separate states, the following timber districts may be distinguished:—

1. The North German plain district comprising 49 per cent. of the total forest area, with fir trees as its chief species of timber.

2. The mountain and hill country of Central Germany with pine and beech trees predominating; this district comprises 22 per cent. of the forest area; and

3. The South German district with beech, pine and pitch pine, or 28 per cent of the forest area. Arranged according to these districts, the whole forest area in the German States is owned as follows:—

Crown property	257,302 hectares or	1.8 per cent.
State property	4,489,883	31.9 "
Municipalities	2,258,090	16.1 "
Corporat's, institutions.	211,015	1.5 "
Property in trust	1,446,664	10.4 "
Societies	306,214	2.2 "
Private owners	5,056,701	36.1 "

Predomination of Labor Estates.

Large estates predominate. They offer the greatest security for a systematic and permanent revenue, especially when they take the form of trusts in the hands of public bodies and legal representatives. Of the forest area 64 per cent. is tied property, and 36 per cent. unfettered private property. For purposes of management the forest area is divided into 953,875 units, of which 23,041 consists purely of forest and 931,834 of forest and arable land.

The estates are divided according to size as follows:—

	Of total number.
Estates under 10 hectares.....	89.9 per cent.
" from 10 to 200.....	9.2 "
" from 200 to 1,000.....	0.7 "
" from 1,000 to 5,000.....	0.2 "
" over 5,000	0.3 "

Most of the small estates are situated in the west of Germany, the large forest being in the east.

Small Variety in Species.

The variety of wood species in Germany is not large. Among the numerous indigenous kinds which formerly existed, in consequence of the economic management of forests introduced in the middle of the eighteenth century, only those have been preserved which possess a high economic value, i.e., foliage trees, principally oak and beech, or about 1,000,000 hectares in all. These trees are mostly grown in the plantations of the lower Rhine and Westphalia, but the area devoted to its cultivation is gradually declining, owing to its absorption for agricultural purposes.

Bark wood is likewise declining in extent, because on account of the low prices prevailing for tanning bark. The beech tree (*Fagus sylvatica* L) formerly much grown for fuel has almost lost its importance with the spread of coal mining, and is being displaced to an increasing extent by the better paying conifer. It is mostly to be found in the west of Germany, and on the chalky soil of the south German mountains, and is abundantly represented in the north on the shores of the Baltic from Schleswig Holstein to Pomerania. On account of the good forest qualities of the beech tree valuable species of wood, chiefly oak, maple (*Acer* L), ash (*Fraxinus Tourn*), as well as conifers are grown with it. In many places horn beam (*Carpinus* L), elm (*Ulmus Tourn*) and such soft woods as aspen, poplar (*Populus* L) are planted. The unpretentious birch is to be found everywhere (*Betula* L). Finally, the alder (*Alnus Tourn*) is cultivated as underwood in damp low ground. The beech, including the hardwood species of foliage trees, occupies a total area of about two millions of hectares, soft wood about 0.3 million hectares, mixed foliage tree about 1.2 million hectares, and osier beds 36,000 hectares.

The total area covered by foliage trees amounts to 4.5 million hectares, or 32.5 per cent. of the total forest area, 67.5 per cent. or 9,500,000 hectares, being covered with conifers. The most important species of the latter are the fir and pine, and in the southwest of Germany, the pitch pine mixed with larch. The fir (*Pinus sylvestris* L) the chief wood represented in the sandy plains occupies about 5,500,000 hectares of ground. It thrives best in the dry districts of northeast Germany (east Prussian fir is highly valued) but flourishes also in those districts which have a considerable rainfall, i.e., in the west and on the plateaus of Central Germany from Nuremberg to the Palatinate; with careful treatment fir trees yield a great quantity of wood even in hilly and mountainous country, although this latter wood is of an inferior quality. According to the locality beech, oak, pine, larch, birch and soft woods are frequently grown with it.

Great Forests of Pine.

The pine (*Picea excelsa* Lk) forms great forests which cover the mountains of middle and southern Germany, but from time immemorial it has been a native of the plains in eastern Prussia, Silesia and Hanover. About 2,500,000 hectares of ground are covered by pine trees, and this area will continue to increase because the pine is hardy and easily cultivated, and yields a great quantity of timber in a relatively short time. Consequently, in afforestation the pine tree is preferred to others, and is also used as a substitute for the economically inferior foliage tree. The pitch pine (*Albies pectinate* DC) is usually grown in the Black Forest and the Vosges, but it is to be found everywhere in mixed woods in the northeast of the country. It occupies an area of about 300,000 hectares. The larch (*Larix europea* Will) is to be found everywhere intermingled with other woods, but is at its best in mountainous regions.

Management of Tall Timber.

Of the typical kinds of forestry, tall timber predominates throughout about 11,000,000 hectares. Bare clearing with artificial renewal is the general rule for fir and pine trees, seeding in with natural renewal for foliage trees and pitch pine. The cultivation of tall timber necessitates long period of management, great areas of cultivation, systematic management and constant care, but yields most wood and the greatest value per hectare.