

**REPORT ON FORESTRY IN
NORTHERN NEW JERSEY.
REPORT ON FOREST FIRES
FOR SEASON 1895; PP. 99-187**

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C. C. VERMEULE

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REPORT ON FORESTRY IN NORTHERN NEW JERSEY.

BY C. C. VERMEULE.

Last year we began a detailed survey and inquiry into the physical condition of the forests of Northern New Jersey, and reported thereon in the last Annual Report. This work has since been extended to cover all of the Highlands, the Central Passaic valley, and that portion of the country east of the Watchung mountains which is included in Bergen, Hudson and Essex counties. As a result of this work we now know the location and extent of all forested areas, and the size, varieties and character of the growth. The forest is considered in these studies to include the following classes:

1. Brush or stump land, to include no areas intended to be cleared and cultivated.
2. Old clearings formerly cultivated, but now growing up to timber.
3. Young growth, in which class was included all timber less than six inches diameter, the approximate age, size and height being noted.
4. Large timber, including all over six inches in diameter, the diameter and height being noted as before.

Without attempting any strict botanical classification, the varieties of timber have been designated as follows:

1. Deciduous, with the prevailing varieties indicated.
2. Coniferous, classified as pine, cedar, hemlock, &c.
3. Mixed deciduous and coniferous.

Notes were kept of the general character of scattered growth over lands under cultivation, also of the general condition of the forested areas, and of any remarkably large trees, any original forest, planted timber, brush land which seems incapable of producing timber, the

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succession of growth, &c. Information was also collected as to the value per acre of stump land of twenty-years or thirty-years growth, and all heavy timber of various kinds; also of the testimony of reliable persons as to how the amount of timber now standing compares with that of previous periods, and of how the growth on slopes of hills compares with that in the valleys or on the top of plateaus.

It will be noted that the inquiries were of the most practical kind, and it is believed that the information obtained will be of value in reaching an understanding of the actual economic condition of our forested areas. Thus far they have developed the fact that there have been no important changes either in the limits of cultivated land, or in the proportion of forested and cultivated areas, since the topographical surveys were begun in 1877. There have been minor changes, and a few old clearings of small area have been allowed to grow up, the areas thus added to the forests being just about offset by that which has been brought under cultivation, likewise in small, scattered parcels.

The topographical maps showed forested lands as distinguished from those under cultivation. They made no attempt to indicate the varieties, size or condition of the timber. There is very little land in the State which, if left uncultivated, does not spontaneously produce, in a few years, a fairly good growth of timber; consequently, the land represented as forest on the maps, for which the surveys were completed in 1887, ranges from brush to good timber of from forty to fifty years growth, and for the most part every gradation of growth is represented in due proportion. The examinations made during the past year have attempted to differentiate this growth into varieties of trees, age and size, as we have explained.

Like almost every other physical feature of the State, the forests may be classed broadly into five divisions corresponding with the geological formations, and each of the three northern divisions must be subdivided into glaciated and unglaciated districts. There is a marked difference in the proportion of forest area, and also a less marked difference in the varieties of timber north and south of the terminal moraine line. Consequently we can most conveniently consider the forests by the several topographical divisions adopted and followed in the "Physical Description" of the State, published in 1888.

For convenient reference, and in order to give something like completeness to this present progress report, we have incorporated herein the results of the two years' work.

THE HIGHLANDS.

The region known as the Highlands has been often described in the reports of the Survey. Its boundaries are indicated on the accompanying map, and it is the region of Archean or gneissic rocks. The most significant geological subdivision in connection with forestry is into two districts; first, the northeastern or glaciated, and second, the southwestern or unglaciated Highlands. The former being denuded of soil on the ridges, and the valleys filled with gravel, boulders, &c., by the action of the great ice sheet, is less adapted to agriculture, consequently more generally forested than the southwestern portion, which has smoother ridges, well covered with soil, and clean, uncluttered valleys.

We may indicate the difference by comparing the percentages of forest areas in two classes of townships, each typical of one of these subdivisions of the Highlands.

GLACIATED NORTHEASTERN HIGHLANDS.

Township.	County.	Percentage of area in forest.
Byram.....	Sussex.....	77
Jefferson.....	Morris.....	74
Rockaway.....	".....	72
West Milford.....	Passaic.....	74
Pompton.....	".....	76

UNGLACIATED SOUTHWESTERN HIGHLANDS.

Mendham.....	Morris.....	30
Chester.....	".....	46
Washington.....	".....	32
Lebanon.....	Hunterdon.....	27
High Bridge.....	".....	26
Bethlehem.....	".....	35

It will be seen that the northeastern section has, generally, 75 per cent. of the area forested, as against about 30 per cent. of the southwestern, and this difference is undoubtedly almost entirely due to the different surface conditions brought about by glacial action.

The forests of this Highlands region have a direct relation to the future water-supply of the State, for here lie the splendid gathering-grounds which are already coming rapidly into use for the supply of our cities. We estimate that the Highlands region has in all about

340,000 acres of forest, of which 240,000 acres are in the northeastern, and 100,000 acres in the southwestern section. In our detailed descriptions of each of these subdivisions we shall follow the topographical subdivisions of the Highlands which we adopted in the "Physical Description" published in 1888, beginning on the northwest and passing to the southeast side of the plateau.

FORESTS OF THE NORTHEASTERN HIGHLANDS.

First, on the extreme northwest of this district we have Pochuck mountain, a Highlands region lying detached from the main plateau, like an island, at the eastern side of the great Kittatinny valley. The forests of this region cover about two-thirds of the area, and consist mainly of oak and chestnut, with a considerable amount of hemlock, and some red cedar where old clearings have grown up. A considerable portion of this timber is from 40 to 50 years old, and there are a number of large trees which we shall note later in connection with the forests of the main plateau.

Vernon valley, which separates Pochuck mountain from the main group of the Highlands, is a fertile agricultural district, with a very small amount of forest, but it has a goodly supply of scattering trees which are thrifty and often of large size.

Passing on to the southwest we come to the Alamuche-Pohatcong range, the glaciated portion of which includes the district lying between the Lehigh and Hudson River railroad on the west, and the valleys of the Walkill and Lubber's run on the east, and extending from Franklin Furnace southwest to the Vienna and Hackettstown road. We find the conditions as follows: From Franklin Furnace southwest to the line of the New York, Susquehanna and Western railroad, this ridge is known as Pimple Hill. The growth of wood is thin, ranging from 2 to 8 inches in diameter, and consisting mainly of chestnut, oak and red cedar, with a few other coniferous trees scattered throughout the whole district. On the high hill near the railroad and north of Sparta, and also along the ravine southwest of Franklin Furnace, the conifers are quite abundant. The growth, however, is principally chestnut and oak, the best of which is from 6 to 24 inches in diameter, and 30 to 55 feet high, a good proportion of these trees being about 12 inches in diameter. Not much cordwood is cut in this section, but the best timber is selected and taken out

here and there as needed. Between the New York, Susquehanna and Western railroad and the highway from Sparta to Pinkneyville there are very few coniferous trees, chestnut and oak being predominant, and somewhat larger than on the Pimple hills, measuring from 9 to 16 inches in diameter and 30 to 55 feet high. Just northwest of Sparta there is a ridge which has been entirely stripped of timber, but there is no clearing in any of this district for farming purposes, and there does not appear to be much cleared land lapsing back into forest. The flat swamp land on the Wallkill southwest of Sparta has some timber, mostly bordering the stream. There are maples and elms 12 to 24 inches in diameter and 40 to 50 feet high interspersed with a good deal of brush, and near the head of the swamp there are a few good white pines, also a number of hemlocks about the headwaters of the stream. The ridge just west of this swamp is well wooded at the north end, the trees being mostly 10 to 14 inches in diameter, but ranging up to 24 inches. The larger trees have been cut out at the southern end of the ridge. There are red cedars bordering the clearings. Tar Hill ridge in Andover township, just east of the Lehigh and Hudson River railroad, is quite well wooded. A small portion has been cut off within the last five years, more within ten years, but generally the timber runs from 6 to 24 inches in diameter and from 30 to 50 feet high, the larger sizes being not very numerous. There are a good many hemlocks and red cedars and a few white pines. On the ridge line between the upper Wallkill and the easterly branch of Lubber's run, and stretching from Sparta to Roseville, the timber is small southward as far as the Gaffney mine, most of the large growth having been cut out. In a few spots trees were noted 18 to 24 inches in diameter, but for the most part they are less than 8 inches. On the west slope there are a great many red cedars and a few hemlocks. In the swamp near Gaffney mine, and also the one just southwest along Lubber's run, there are a good many tamaracks. The hills just east of Stag pond are well wooded on the tops, the trees ranging from 6 to 18 inches in diameter, but the steep slope just east of the pond and its-outlet is broken and rocky, and is mostly red cedar and hemlock, with a few white pines. There are also hemlocks and a few white pines on the ridge north of Roseville. A tract of 500 acres at Roseville has had all trees 9 inches in diameter and over cut out. An examination of the stumps showed that oak 60 to 70 years old ranged from 18 to 24 inches in

diameter; from 40 to 50 years old ranged from 18 to 21 inches, being mostly 13 and 14 inches. An oak stump 89 years old measured 24 inches, and showed that for the first 20 years the growth had been very slow. Chestnut 68 years old measured 31 inches, and hickory 90 years old 19 inches. Generally over this tract from Sparta southwest to the Roseville and Andover highway the timber was in good condition. In a few places it had been cut within 3 years; other tracts within 15 years, but a great many of the trees would average from 12 to 20 inches in diameter. Other portions would average from 8 to 15 inches in diameter and from 40 to 55 feet high, although some of the largest timber seemed to be over 60 feet. While oak and chestnut predominate, there is scattering white pine and hemlock throughout.

Between the Andover and Roseville highway, the Sussex railroad and Lubber's run there are a few trees 24 inches in diameter, but for the most part they run from 6 to 14 inches, with a height of from 30 to 50 feet. Near Andover, on the road to Roseville, the timber was 10 to 20 inches in diameter, and 50 to 60 feet high.

The portion of this district extending from Sussex railroad southwest to the highway from Hackettstown to Alamuche is known as Alamuche mountain, and is almost a solid forest. In the Kitatinny valley, between the foot of the mountain and the Lehigh and Hudson River railroad, the country is highly cultivated, the scattering patches of timber being composed of small oaks and chestnuts from 4 to 6 inches in diameter and 15 to 35 feet high. In each grove there are a few large trees from 10 to 30 inches in diameter and 40 to 60 feet high, but most of these larger trees have been cut out for timber or other purposes. There are also a good many red cedars. Along the streams and in the swamp near Alamuche elms and maples prevail, the larger ones being 24 inches in diameter and about 50 feet high. There has been a considerable amount of clearing recently in this swamp, which is being ditched and brought under cultivation as a result of the improvement in the drainage of the Pequest valley. Passing along the road from Andover to Alamuche the first growth seemed to range from 8 to 20 inches in diameter and about 55 feet high; further along, from 6 to 24 inches in diameter and from 30 to 55 feet high, mixed with a smaller and denser growth. About Tranquility timber was noted from 10 to 20 inches in diameter and 40 to 50 feet high, and near Alamuche it

ranged from 4 to 18 inches and from 20 to 45 feet high. It is somewhat similar toward the top of the mountain eastward from Alamuche, and there seems to be a predominance of trees all through the mountains, ranging from 7 to 11 inches in diameter. Trees as large as 20 inches are scarce and scattering, while there is a good deal of young and small growth. There are a few hemlocks on the rocky slope north of Cranberry reservoir, on the end of the mountain north of Alamuche, and near Waterloo, while the swamp north of Waterloo has some tamaracks. South of the road from Alamuche to Waterloo there is a game preserve or deer park, and the wood is chestnut and oak, with some hickory, whitewood, birch, maple and elm. South of the road from Warrenville across the ridge to Saxton Falls, the timber is very short, mostly chestnut and oak on the tops of the hills. On the east slope, where it has not been cut, there is a thrifty growth of chestnut and oak ranging from 6 to 14 inches in diameter. A considerable portion has been cut within 3 years.

Mr. James French, of Waterloo, owns 3,000 acres of timber in this vicinity. Mr. Henry French, his son, reports that they do not cut any cordwood there now, as they do not find it profitable, not being able to compete with the pine cordwood of South Jersey. They sell a good deal of timber on special orders for various purposes, getting out almost anything, for ship-building or other purposes, which may be required. Their tract does not produce timber quite as fast as they need at present. He claims that they work up everything and waste nothing, and thinks that forests are generally in a better condition now than they were 40 years ago, as the larger mills are not cutting much and cordwood is not profitable, that the demand is for the largest timber, and consequently the younger growth is allowed to mature. These gentlemen also peel quite a good deal of butternut, hickory, oak and birch bark for their trade.

It is interesting to note that about 20 years ago Mr. French bought a tract of woodland in these mountains which had been cut off a few years before. This tract has not appeared to grow since, and is said to be not much more than brush at present.

Continuing southwest to the road from Hackettstown to Vienna we find that the timber is inferior in quality. On the slope just northwest of Hackettstown the timber has been cut within three years, but on the hill-top it is 6 to 14 inches in diameter and from