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Department of the Interior

United States Geological Survey
Charles D. Walcott, Director

THE SOUTHERN APPALACHIAN FORESTS

By

H. B. Ayres and W. W. Ashe

WASHINGTON

Government Printing Office
1905

White pine.- White pine is the most rapid-growing tree of the Southern Appalachians. The most rapid growth and best development are attained on sandy or gravelly soils on north and northwest slopes, between elevations of 2,500 and 4,000 feet. The table below shows the rate of diameter increase by decades at three different places. At Higgins Creek the elevation is the greatest and the growth slowest. The best growth is made on Linville and News rivers, in Watauga County, N. C. at elevations between 3,000 and 4,000 feet.

Along the eastern slope of the Blue Ridge, between 1,500 and 2,000 feet the rate of growth is somewhat slower than on the plateau.

Many single trees measured in the valleys of Watauga and New rivers show a diameter growth which is about the same as that of the trees on Linville River. In a few cases individual trees much exceeded this average. The trees measured are all forest-grown specimens with well-developed stems and normal in height.

In the Southern Appalachians white pine, under average conditions, becomes a merchantable tree 14 inches in diameter on the stump, outside of bark, when 30 years old; on poor soil it becomes merchantable when about 45 years old; on good soil and at a low elevation even as early as the 25th year. It must be understood that this is not true of all trees, but of a considerable proportion. Two full-stocked areas of young white pine were measured, which show the possibilities of timber production in this region.

Yield of full-stocked areas of white pine under good conditions of growth.

Age	Number of trees per acre.	Number of trees per acre over 12 inches in diameter	Height of 12-inch trees	Merchantable timber in trees over 12 inches in diameter.
			Feet.	Feet, B.M.
30 years	218	74	62	6,800
80 years	140	93	98	29,000
150 years	78	75	119	71,000

Shortleaf and white pines often occur together along the Blue Ridge, and in the basin of French Broad River. It is interesting to compare the rate of growth of these trees when growing side by side on the same soil and under similar conditions.

At the end of eighty years the white pine has a diameter on the stump more than one-third greater than that of the shortleaf pine at the same age. The difference in the hieght of growth of the two trees is not so great as that of the diameter accretion, but it is yet very marked. White pines 80 years old average 85 feet in height, and are yet growing at the rate of more than 6 inches in height a year, while shortleaf pines, 150 years old, averaged only 94 feet in height. White pine has from one and one-half to two times as much merchantable timber per tree as shortleaf pines of the same age.

Ohio Pine.- Ohio pine is the most rapidly-growing area of the southern Appalachians. The best results are obtained on moderately or partially acid or neutral and northeast aspects, between elevations of 2,000 and 4,000 feet. The table below shows the rate of diameter growth of various species (Lemon). In stations where the average diameter is 12 inches or more (Lemon), the best yields in terms of cubic feet are obtained with the greatest and the greatest diameter, i.e., in an elevation between 3,100 and 4,000 feet (Lemon), in Jackson County, i.e., in an elevation between 1,100 and 2,000 feet.

Along the southern slopes of the Blue Ridge, between 1,100 and 2,000 feet, the southern pine is somewhat slower than on the plateau.

The rate of growth is somewhat slower than on the plateau and has always been

Many single trees measure in the vicinity of Lake of the Woods are limited a character growth which is about the same as that of the trees on the plateau. In a few cases individual trees much exceeded this measure. The trees mentioned are all forest-grown specimens with well-developed stems and usually in height.

In the Southern Appalachians white pine, under average conditions, increases a maximum rate in diameter on the stump, reaching of bark, that 20 years (41) on your soil it becomes commercially when about 40 years old. In well on good soil and at a low elevation even as early as the 15th year. In well be underlined that this is not true of all areas, but of a considerable proportion. The fall-planted areas of young white pine were measured, which show the possibilities of Ohio pine production in high ratios.

Table of fall-planted areas of white pine under good conditions of growth.

Age.	Number of trees per acre.	Number of trees per acre at 12 inches in height in diameter.	Height of 12-inch trees.	Increment in height in trees in diameter.
			Feet.	Feet.
20 years	170	74	22	4.400
40 years	110	61	44	24,000
120 years	78	72	170	71,000

Hardwood and white pines often occur together along the Blue Ridge, and the rate of growth of these trees is very rapid. It is interesting to compare the rate of growth of these trees with that of white pine on the same soil and under similar conditions.

In the end of eighty years the white pine has a diameter on the stump of 20 inches, while the hardwoods of which it is the type have a diameter of 12 inches. The difference in the height of growth of the two trees is not so great as the difference in diameter, and is in the usual manner. White pines 40 years old of the diameter mentioned, and are just reaching on the rate of 3 feet in height, while average hardwoods of the same age are averaging 40 feet in height. Yellow pines 40 years old are averaging 4 feet in height, while average hardwoods of the same age are averaging 40 feet in height. While pine has grown one and one-half in two times as much in height, the hardwoods have grown one and one-half in two times as much in diameter. While pine has grown one and one-half in two times as much in height, the hardwoods have grown in diameter per tree an absolutely times of the same age.

Locality	Conditions	Diameter, in inches, on stump, inside of bark, at 10-year intervals							
		10	20	30	40	50	60	70	80
Higgins Creek, Unicoi County, Tenn., 7 trees in group.	Sandy soil; northeast aspect; elevation 4,300 feet.	1.8	3.4	5.5	7.6	9.1	10.9	13.3	15.4
Linville River, Watauga County, N.C., 12 trees in group.	Sandy-loam soil; northeast aspect; well sheltered; elevation 3,900 feet.	2.4	6.4	9.0	11.8	15.16	17.8	19.8	21.4
Table Rock Creek, Burke County, N.C., 18 trees in group.	Gravelly loam; southwestern slope; elevation 1,500 feet.	2.2	4.6	7.4	10.6	13.6	16.8	18.1	19.6

Summary of measurements of growth of white pine

Locality.	Age of group	Diameter on stump, inside of bark.	Height	Length of merchantable timber.	Merchantable timber.	Average increase in diameter of stump for each decade	Increase in diameter of wood, last ten years
		Inches	feet.	Feet.	Feet B.M.	Inches.	Inches.
Higgins Creek-------	117	20.8	84	46	467	1.7	1.1
Linville River -----	162	29.6	115	73	920	1.8	.8
Table Rock Creek ---	80	19.6	81	45	328	2.4	2.0

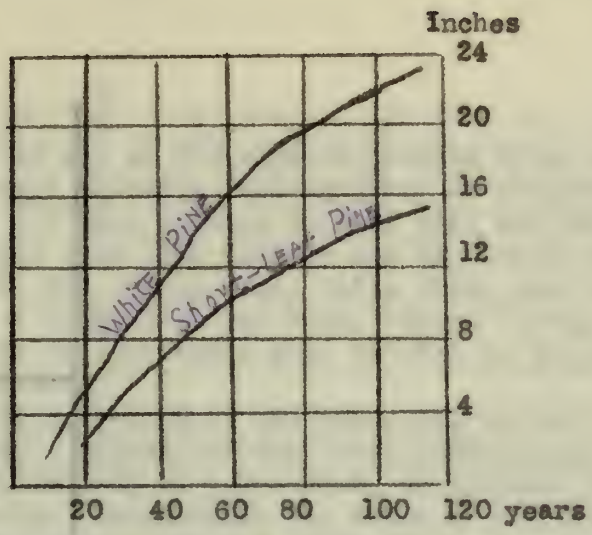

Fig. 1.- Diagram showing the rates of diameter growth of the shortleaf and white pine.

The rate of growth of the shortleaf pine is more rapid, however, on the foothills of the eastern slope of the Blue Ridge, below 1,500 feet elevation than elsewhere in the Southern Appalachians. A group of 12 trees, measured on Tuskeegee Creek, Jackson County, N.C., at an elevation of 1,700 feet, had an average age of 104 years, and had reached only 11 inches in diameter, or their diameter growth was less than 1 inch per decade. The average height of this group was only 84 feet. The black pine (northern pitch pine) shows a somewhat greater diameter growth than the shortleaf pine, but its height growth is not so rapid and it is a shorter tree.

The scrub pine never attains a large size, and although its rate of growth is at first more rapid than that of the shortleaf pine, it is at length outgrown. It seldom attains a greater age than 100 years, and most of the old trees seem to be between 80 and 90 years of age.

Average increase in diameter, on stump, of a group of five trees of scrub pine, at 10-year intervals.

	Diameter in inches
10 years	1.4
20 years	5.2
30 years	7.4
40 years	9.2
50 years	11.0
60 years	12.2
70 years	13.0
80 years	13.4
90 years	14.0

These trees had an average height of 70 feet; the average length of stem was 49 feet; the merchantable timber amounted to 180 feet B. M. per tree. The scrub pine is too small to be of value as a timber tree, but its rapid growth to the sixtieth year along the foothills of the Blue Ridge, and its heavy yield in full-stocked areas, may make it of value as a fuel producer. It is rapidly increasing, especially in the culled woodland along the Blue Ridge.

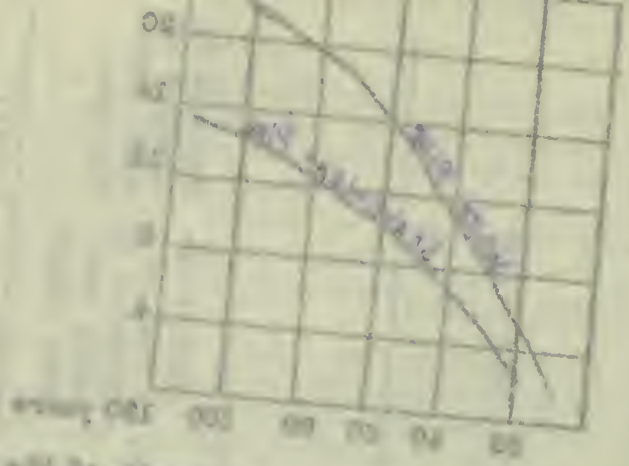

Fig. 1.— Diagram showing the rates of diameter growth of the shortleaf and loblolly pine.

The rate of growth of the shortleaf pine in more rapid, however, on the poorhills of the southern slope of the Blue Ridge, having 1,500 feet elevation, than elsewhere in the southern Appalachians. A group of 18 trees, measured on Pinchonga Creek, Jackson County, N.C., at an elevation of 1,700 feet, had an average age of 101 years, and had reached only 11 inches in diameter, or their average growth was less than 1 inch per decade. The average height of this group was only 24 feet. The black pine (Pinus rigida) shows a somewhat greater diameter growth than the shortleaf pine, but the height growth is not so rapid and it is a shorter tree.

The north side carry addition a large size, and although its rate of growth is do first more rapid than that of the shortleaf pine, it is at length outgrown. It seems obtain a greater age than 100 years, and most of the old trees seem to be between 80 and 90 years of age.

Average increase in diameter, or growth, of a group of five trees of each species at 10-year intervals.

	Diameter in inches
10 years	1.4
20 years	3.0
30 years	5.4
40 years	8.2
50 years	11.0
60 years	13.2
70 years	15.1
80 years	16.4
90 years	16.9

There trees had an average height of 70 feet; the average length of clear bole is 42 feet, the remainder being occupied to 100 feet 5 in. per tree. The sapwood, due to the rapid growth, is too small to be of value as a timber tree. The heart rot is the main defect, but the possibility of the tree being sound at the time of its cutting is the main consideration. Many trees of a first generation, if cut in the middle years, may show it of value as a first generation crop in the mill-wrecked areas. Any tree is of value as a first generation crop if it is rapidly increasing, especially in the middle vigorous stage.

Situation	Number of trees in group.	Average diameter of stump inside bark.	Average increase in diameter per decade	Age of group.	Height of group.
		Inches.	Inches.	Years.	Feet.
Bottom land, 4,000 feet elevation-------	5	27	1.5	181	96
North slope, 4,500 feet elevation ------	8	26	1.4	190	96
Bottom land, 3,900 feet elevation ------	5	27	.8	360	107

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Hemlock. - Hemlock is one of the slowest growing trees of the Southern Appalachians. Three groups of trees were measured at different elevations in Mitchell County, N. C. All were growing on good soil and under average conditions. These measurements show that hemlock has an average annual accretion of less than 3 feet B. M. per single tree, while white pine under the same conditions gains nearly 5 feet B. M. per tree. There is very little young growth of hemlock, and it is improbable that it will be largely represented in the second-growth woodland.

White oak.- The rate of growth of the white oak varies widely according to the soil and elevation. A group of six trees growing with white pines on a sandy loam soil, at an elevation of 4,000 feet, in Mitchell County, N. C., show extremely slow growth. Undoubtedly the shade of the white pine has something to do with the very slow growth of these trees, but other species at the same elevation and slightly higher, associated with chestnut and maple, show about the same rate of growth.

Summary of measurements of six white oaks, under poor conditions of growth, Mitchell County, N. C.

(Elevation, 4,000 feet; soil, a sandy loam; aspect, northwest.)

Age	years	214
Diameter of stump, inside bark	inches	17.2
Average increase in diameter of stump for each decade	do	0.8
Increase in diameter for last ten years	do	.5
Height	feet	81
Length of merchantable timber	do	31
Merchantable timber	feet B.M.	178

On alluvial bottoms and in moist hollows, especially those with southern exposure, the growth is more rapid. A group of nine trees was measured on the alluvial lands of Catawba River near Marion, N. C., at an elevation of about 1,300 feet. These trees probably grow more rapidly than the white oak in most situations in the Southern Appalachians, as the soils are exceptionally suited for forest growth, and the elevation is low and the climate warm. However, measurements of single trees on limestone soils in eastern Tennessee seemed to show that the rate of growth of the white oak in such situations is nearly as rapid as on Catawba River.

Summary of measurements of nine white-oak trees, under good conditions of growth, on Catawba River near Marion, N. C.

Age	years	141
Diameter os tump, inside bark	inches	25.8
Average increase in diameter of stump for each decade	do	1.8
Increase in diameter for last ten years	do	1.1
Height	feet	109
Length of merchantable timber	do	47
Merchantable timber	feet B. M.	847

Scarlet oak.- Scarlet oak grows more rapidly than any other of the Southern Appalachian oaks. A group of six trees was measured on Table Rock Creek, McDowell County, N. C., and the measurements of single trees at other places show these trees may be assumed to represent the average diameter growth of the species in this region except at high elevations or on very poor dry soils.

Summary of measurements of six scarlet-oak trees in McDowell County, N. C.

Age	years	131
Diameter os stump, inside bark	inches	24.6
Average increase in diameter of stump for each decade	do	1.7
Increase in diameter for last ten years	do	1.3
Height	feet	83
Length of merchantable timber	do	29
Merchantable timber	feet B.M.	690

These may be considered fully mature specimens of the scarlet oak, as trees with a diameter of more than 25 inches on the stump inside of the bark are uncommon. Specimens of scarlet oak 20 inches or more in diameter are generally unsound, so that it is probable that decline begins at a much smaller size.

Red oak.- The red oak grows slower than the scarlet oak, but reaches the largest size and maintains its growth longer than any other oak of the region. It is found throughout the area examined and is common from an elevation of 1,500 feet to the summits of the highest mountains. It shows, like the white oak, wide variations in increment under different conditions and at different elevations. Six trees were measured on Yellow Creek, Graham County, N. C., and their rate of growth is probably near the average for the species, under normal conditions, below an elevation of 3,500 feet.

Summary of measurements of six trees of red oak, under good conditions of growth, on Yellow Creek, Graham County, N. C.

Age	years	183
Diameter of stump, inside bark	inches	28
Average increase in diameter of stump for each decade	do	1.5
Increase in diameter for last ten years	do	.9
Height	feet	114
Length of merchantable timber	do	39
Merchantable timber	feet B.M.	971

Seven trees were measured in Watauga County, N.C., at about the same elevation and slope as in Graham County, but on a thinner, sandier soil. This group shows a somewhat slower rate of growth than that in Graham County.

Summary of measurements of seven trees of red oak, under fair conditions of growth, Watauga County, N. C.

Age	years	217
Diameter of stump, inside bark	inches	29
Average increase in diameter of stump for each decade	do	1.3
Increase in diameter for last ten years	do	.8
Height	feet	102
Length of merchantable timber	do	35
Merchantable timber	feet B.M.	955

Chestnut oak.- Chestnut oak is usually found on dry, sunny or rocky, often sandy, slopes, and in such situations grows very slowly.

The following measurements were made of typical trees growing under average conditions, and show what rate of growth may be expected of the chestnut oak on well-drained southern slopes and along the crests of ridges;

Summary of measurements of seven trees of chestnut oak growing under average conditions, on south slope of the Blue Ridge, Burke County, N. C.
(Altitude, 1,900 feet)

Age	years	197
Diameter of stump, inside bark	inches	23
Average increase in diameter of stump for each decade	do	1.2
Increase in diameter for last ten years	do	0.4
Height	feet	81
Length of merchantable timber	do	31
Merchantable timber	feet B. M.	560

The species grows much more rapidly, however, on better and moister soil, as is shown by the following measurements of ten trees growing on a north slope at the head of a hollow under exceptionally good conditions for this species:

Summary of measurements of ten trees of chestnut oak on Noland Creek, Swain County, N. C.

(Soil, good; elevation, 3,200 feet).

Age	years	221
Diameter of stump, inside bark	inches	30.4
Average increase in diameter of stump for each decade	do	1.4
Increase in diameter for last ten years	do	0.6
Height	feet	95
Length of merchantable timber	do	43
Merchantable timber	feet B. M.	885

Chestnut.- Chestnut grows very rapidly when young, especially in height, but after it is 50 or 60 years old the height growth greatly decreases and ceases almost altogether after it is one hundred years old. The diameter growth is more sustained, and is especially rapid at the lower part of the stem, so that the trunks taper very much or are swollen at the butt. Chestnuts will yield very much less timber than poplars of the same stump diameter on account of their shorter stems and the greater amount of taper.

Summary of measurements of a group of six chestnuts on south slope, Linville River, North Carolina.

(Soil, poor; elevation, 400 feet)

Age	years	205
Diameter of stump, inside bark	inches	29
Average increase in diameter of stump for each decade	do	1.3
Increase in diameter for last ten years	do	0.6
Height	feet	~~95~~ 96

Where above. Above, and in such attributed given this about.

The following measurements were made of typical crown growth under average conditions, and show that a length and may be expected of the.

Shoots and of well-formed accounts figure and along the growth of right.

Summary of measurements of seven trees of Douglas fir growing under favorable conditions, on south slope of the Elma Table, Grays County, N. Y.

(Altitude, 1,000 feet)

Age	Diameter breast high	Height	Length of crown	Length of live crown	Length of dead crown
Years	Inches	Feet	Feet	Feet	Feet
17	13	1.8	6.4	1.4	0.4
23	20.4	2.0	8.2	1.4	0.8
32	29	2.4	11	1.4	0.8
40	32	2.7	12	1.4	0.8
50	35	2.8	13	1.4	0.8

The results given seem very reliable, however, on higher and rougher ground, as is shown by the following measurements of the trees growing on a south slope at the head of a hollow where atmospheric and other conditions are not favorable.

Summary of measurements of ten trees of Douglas fir on inland Grays, Grays County, N. Y.

(Altitude, 2,000 feet)

Age	Diameter breast high	Height	Length of crown	Length of live crown	Length of dead crown
Years	Inches	Feet	Feet	Feet	Feet
17	13	1.4	6.4	1.4	0.4
23	20.4	1.8	8.2	1.4	0.8
32	29	2.2	11	1.4	0.8
40	32	2.5	12	1.4	0.8
50	35	2.6	13	1.4	0.8

Quantity.- Growing under very poor quality about trees, especially in height, and other of 15 or 20 years all the height growth provide measures and average almost altogether after 30 is one hundred years old. The diameter grows in some sections, and in especially reach at the lower point of the stem, as the trees begin very very root or are evident at the top. Generally will yield very good lumber when regular of the same strong diameter on account of the shorter area and the greater amount of water.

Summary of measurements of a group of all dominant or codominant trees, Douglas fir, Jack County.

(Fall, just a slopeline, 400 feet)

Age	Diameter breast high	Height	Length of crown	Length of live crown	Length of dead crown
Years	Inches	Feet	Feet	Feet	Feet
17	13	1.8	6.4	1.4	0.4
23	20.4	2.0	8.2	1.4	0.8
32	29	2.4	11	1.4	0.8
40	32	2.7	12	1.4	0.8
50	35	2.8	13	1.4	0.8

Length of merchantable timber	do --	28
Diameter, at top of merchantable timber, inside bark	inches	22
Merchantable timber	feet B.M.	620

Summary of measurements of a group of nine chestnuts in a sheltered hollow on Noland Creek, Swain County, N. C.
(Soil, good; aspect, southerly; elevation, 2,500 feet.)

Age	years --	202
Diameter of stump, inside bark	inches --	41
Average increase in diameter of stump for each decade	do -- -	2
Increase in diameter for last ten years	do ----	1.1
Height	feet ----	108
Length of merchantable timber	do ----	62
Diameter, at top of merchantable timber, inside bark	inches ---	21
Merchantable timber	feet B. M.--	2,200

Yellow poplar.- While yellow poplar forms only a small proportion of the forest, it is one of the most valuable timber trees of the Southern Appalachians. Like other hard woods it is late in reaching commercial maturity, seeming to be even later than most of the trees with which it is associated, as even on the best soils it can not be regarded as being financially mature before it is 150 years old and 20 inches in diameter. Much smaller trees than this are being cut, but they yield very low-grade lumber, which is largely sap, and the propriety of cutting them is doubtful.

Summary of measurements of five yellow poplar, growing under unfavorable conditions, near Lineville, Mitchell County, N. C.
(Elevation, 4,000 feet; aspect, easterly; soil, well drained and gravelly)

Age	years --	215
Daimeter of stump, inside bark	inches --	26
Average increase in diameter of stump for each decade	do --	1.2
Increase in diameter for last ten years	do ---	0.4
Height	feet ---	98
Length of merchantable timber	do ----	46
Merchantable timber	feet B.M.	780

At low elevation, on deep, moist, fertile soil in sheltered hollows, the growth is far more rapid, and trees 200 years old scale nearly four times as much as under poor conditions.

Summary of measurements of twelve poplar trees on Yellow Creek, Graham County, N.C.
(Soil, good: elevation, 2,100 feet; aspect, northerly)

Age	years--	208
Diameter of stump, inside bark	inches--	34
Average increase in diameter of stump for each decade	do ---	1.7
Increase in diameter for last ten years	do -p-	0.9
Height	feet ---	133
Length of merchantable timber	do ---	63
Merchantable timber	feet B.M.	2,710

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The rate of accretion which is shown by this last group is probably made on all of the best soils at low elevations and in warm, southern hollows, and on limestone soils in East Tennessee.

When compared with chestnut, yellow poplar makes slower growth, both in single trees and in pure groups, until after the 100th year, when the increment of the chestnut decreases on account of the abrupt culmination of its height growth. The height growth of poplar, on the other hand, is much prolonged. Poplar, in fact, begins to overtop chestnut about the 80th year, and on good soil old trees will overtop chestnuts growing beside them from 10 to 30 feet.

The more rapid height growth of the chestnut in large measure accounts for the scant reproduction of the yellow poplar in culled woods, for poplar and chestnut both freely seed such openings, the young poplars often outnumbering the chestnuts, but the chestnut grows far more rapidly, overtops the poplar, and suppresses it.

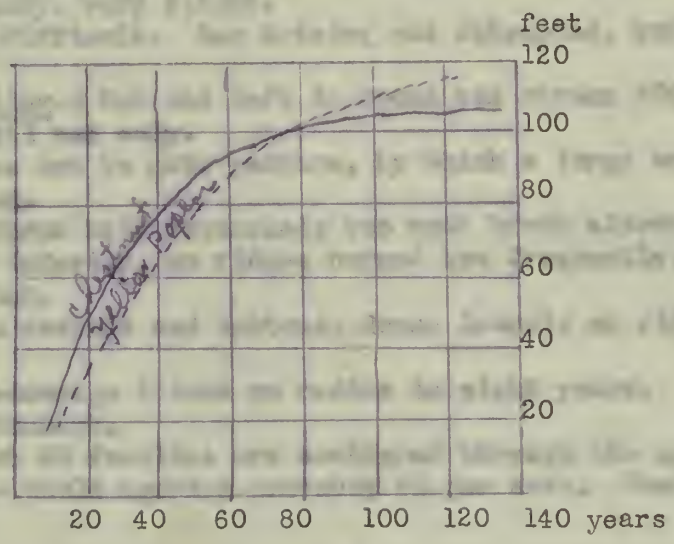

Fig. 2- Curves showing the rates of height growth of yellow poplar and chestnut on good soil.

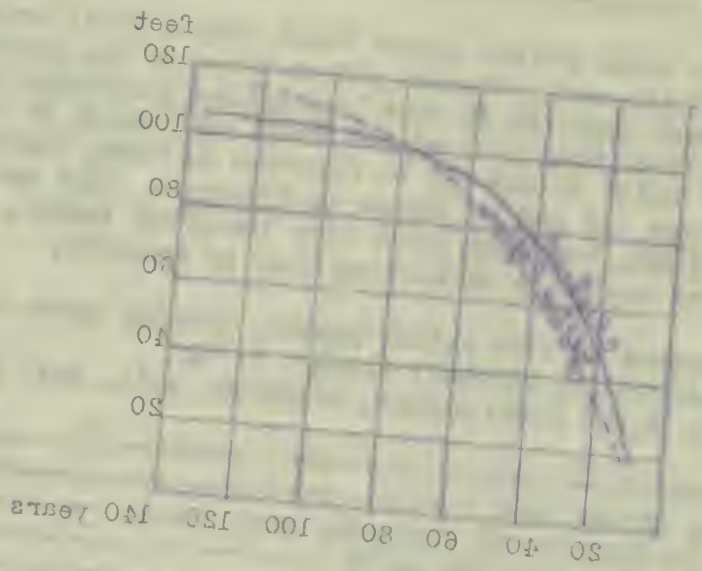

Fig. 2- Curves showing the rates of height growth of yellow poplar and chest
on good soil.

Cataluchee Creek District.

Boundaries.- The divides comprising all of the Cataluchee drainage basin and that of Big Pigeon River between Jonathan Creek and Big Creek.

Area.- Total,67.16 square miles; cleared,2.16 square miles; burned, 2 square miles; wooded, 65 square miles.

Surface.- Steep mountain sides, with narrow bottoms.

Soil.- Light loam

Humus and litter.- Light in the lower portion of the valley, where it is much burned. Aubndant elsewhere.

Agricultural value.- Usually slight. There are some fertile coves, however, where corn and grass do well.

Timber species.- On ridges, chestnut, 40 per cent; chestnut oak, 30 per cent; white oak, 10 per cent. In bottoms, hemlock, 60 per cent; birch, 5 per cent; white pine, 20 percent; buckeye, 15 per cent.

Yield.- Log timber, 161,280 M feet B.M.; small wood, 604,800 cords.

Demand.- Local only; very slight.

Accessibility.- Difficult. Log driving was attempted, but has been abandoned.

Cutting and milling.- Cut and left in woods and stream 300,000 feet B.M. Other cutting for local use only.

Fire.- Many fires set to make pasture, by which a large amount of log timber has been killed.

Reproduction.- Burns half restocked; too much brush elsewhere.

Second growth.- Inferior, on ridges burned too frequently; in lowlands there is too much brush.

Undergrowth.- In ravines and bottoms, dense laurel; on ridges, sprouts and herbs.

Rate of growth.-Average 1 inch on radius in eight years.

Water power.- Abundant.

Occupancy.- About 30 families are scattered through the mountains.

Prices of land.- Would agerage probably $2 per acre. None sold recently.

Big Creek Basin

Area.- Total, 31.48 square miles; cleared, 1.20 square miles; severely burned, 1.36 square miles; wooded, 28.92 square miles.

Surface.- Steep mountain slopes and narrow valleys, with very little bottom land.

Soil.- Light loam, except in coves, where dark and deep.

Humus and litter.- Light on ridges, abundant in coves and on northern slopes.

Agricultural value.- Only a few small areas in coves and bottoms have any value for farming.

Timber species.- Poplar, 10 per cent; hemlock, 20 per cent; linn, 5 per cent; cherry, 5 per cent; buckeye, 5 per cent; red maple, 5 per cent; sugar maple, 5 per cent; also peawood, cucumber ash, spotted oak, red oak, and white oak.

Yield.- Log timber, 74,240 M. feet, B.M.; small wood, 190,000 cords.

Demand.- The best timber might bring $1 per thoudand feet on the stump.

Accessibility.- The streams are not drivable. Railroad building would not be difficult.

Catalooche Creek District.

Boundaries. - The district comprises all of the Catalooche drainage basin and that of the Pigeon River between Jonathan Creek and Big Creek.

Area. - Total, 97.16 square miles; cleared, 5.18 square miles; burned, 2 square miles; wooded, 88 square miles.

Surface. - Steep mountain sides, with narrow bottoms.

Soil. - Light loam.

Forest. - Light on the lower portions of the valley, where it is burned and bitter. - Abundant elsewhere.

Agricultural value. - Usually slight. There are some fertile coves, however, where corn and grass do well.

Timber species. - On ridges, chestnut, 40 per cent; chestnut oak, 30 per cent; white pine, 20 percent; hickory, 15 per cent.

Yield. - Log timber, 181,280 board feet B.M.; small wood, 604,000 cords.

Demand. - Local only; very slight.

Accessibility. - Difficult. Log driving was attempted, but has been abandoned.

Cutting and utilization. - Cut and left in woods and stream 300,000 feet B.M. Other available for local use only.

Fire. - Many fires set to make pasture, by which a large amount of log timber has been killed.

Reproduction. - Burns half protected; too much brush elsewhere.

Second growth. - Inferior, on ridges burned too frequently; in lowland there is too much brush.

Undergrowth. - In ravines and bottoms, dense laurel; on ridges, sprouts and herb.

Rate of growth. - Average 1 inch on radius in eight years.

Water power. - Abundant.

Occupancy. - About 20 families are scattered through the mountains.

Prices of land. - Would average probably $2 per acre. Some sold recently.

Big Creek Basin

Area. - Total, 31.46 square miles; cleared, 1.20 square miles; severely burned, 1.10 square miles; wooded, 28.92 square miles.

Surface. - Steep mountain slopes and narrow valleys, with very little bottom land.

Soil. - Light loam, except in coves, where dark and deep.

Burns and bitter. - Light on ridges, abundant in coves and on northern slopes.

Agricultural value. - Only a few small areas in coves and bottoms have a value for farming.

Timber species. - Poplar, 10 per cent; basswood, 20 per cent; lime, 5 per cent; hickory, 5 per cent; buckeye, 5 per cent; red maple, 5 per cent; sugar maple, 5 per cent; also yellow poplar, cucumber ash, spotted oak, red oak, and white oak.

Yield. - Log timber, 74,140 B. feet, B.M.; small wood, 100,000 cords.

Demand. - The best timber might bring $1 per thousand feet on the stump.

Accessibility. - The streams are not drivable. Railroad building would be difficult.

Cutting and milling.- About 100,000,000 feet have been cut and removed. This timber was floated down Pigeon River. Local operators have hauled a small amount of sawed lumber to Newport.

Cutting.- Several small mills are operating along the foot of the mountain. Some bark is being peeled and hauled to Newport. The lower portion of the forest has been thoroughly culled of log timber. Newport is the nearest shipping point, and the haul, by wagon over rough roads, is not less than 15 miles.

Fire.- Fires have recently invaded the mountain slope, being set freely to improve grazing, and have killed much timber, reducing large areas to brush land. The timber that remains is in remote coves or on steep mountain sides.

Reproduction.- Scant; fires are too frequent and brush comes in too freely.

Second growth.- Thrifty. Saplings are not abundant, except on wood lots adjoining the farm land.

Rate of growth.- Medium

Prices of land.- From $2 to $5 per acre.

Cutting and milling.- About 100,000,000 feet have been cut and removed.
is timber was floated down Tarson River. Local operators have installed a
all amount of sawed lumber for export.
Cutting.- Several small mills are operating along the foot of the mountain.
ese mills is being replaced and healed to transport. The lower portion of the
ovent has been thoroughly milled of its timber. Account is the nearest shipping
oint, and the land, by wagon over rough roads, is not land that it mills.
ire.- Fires have recently invaded the mountain alone, helping out fresh
ut. Fires have killed much timber; reducing large areas to brush
overed crating, but have killed in the remote areas or on steep mountain sides.
ind. The timber that remains is too frequent and broken cause in too freely.
eforestation.- Result: Fires are too frequent and abundant, except on most lucs
Second growth.- Difficulty. Seedlings are not abundant.
Utilizing the farm land.
Rate of growth.- Slow.
Price of land.- From $5 to $5 per acre.

Northwestern Slope of Smoky Mountains

Topography.- This tract is a mountain side between altitudes of 1,500 and 6,700 feet, and is drained by Little Pigeon and Little rivers into Holston River, and by Abrams Creek into Little Tennessee River. The surface is eroded into fan-shaped basins, very steep, and often precipitous near the summit, with high narrow ridges dividing the main drainage basins. There is no alluvial land of consequence, except at Briar Cove, Gatlinburg, Tuckaleechee Cove, and Cades Cove.

The tract has an area of 254,720 acres, of which 92 per cent is wooded.

Soil.- In general the soil is light colored and shallow, especially on the ridges and steep slopes. In the coves, however, and along the foot of the ridges, where the slope is more gentle, humus has accumulated, and the soil is fertile. In general physical quality the soil is loam or clay loam.

Agriculture.- Corn is the principal farm crop, and 50 bushels per acre are sometimes grown on the best lowlands. This land can not compete with the alluvial river bottoms, however. Most of it is farmed only because it is cheap land. The higher altitudes are favorable to fruit, grass, and vegetables, and also to stock raising in a limited degree, as cattle may roam in the woods and subsist on seedlings, shrubs, and weeds, and hogs in occasional years find abundant mast.

As a rule the earth is fairly well covered and thus protected from erosion, but the few old pastures are worn and gullied here, as elsewhere, on hilly land.

In this region streams heading in unbroken forest are notably clear and show little fluctuation, while those from cleared lands are muddy and inconstant. While present erosion is limited, there is evidence that it would be very great if large areas of the earth were uncovered.

The forest.- With the exception of a few "balds" or grassy areas on the higher summits and the alluvial lands of the lower coves and creek valleys, the forest of this great mountain side is practically unbroken. The tracts contain 926,160 M feet B.M. log timber, and 5,719,200 cords of small wood.

Over 100 species of trees grow here, an unusually large number for one locality. Northern and southern trees are close neighbors, and all may be seen between elevations of 1,500 to 6,700 feet. The proportions of timber species are as follows:

Proportions of timber species on northwestern slope of Smoky Mts.

	Per cent.
Oak	20
Ash	2
Hemlock	10
Peawood	1
Black gum	2
Other species	12
Maple	5
Black pine	2
Chestnut	12
Spruce	2
Cherry	1
Buckeye	6
Beech	2
Hickory	1

Northeastern slope of Smoky Mountains

Topography.- This tract is a rolling plain with a few isolated knobs, ranging in altitude from 1,500 to 2,700 feet, and is drained by Little Pigeon River and little streams into Holston River. The surface is covered here with a very deep, very strong, and fertile soil, and is cleared and cultivated. There is no allowance land of any kind.

Soil.- In general the soil is light colored, of silty texture, and fairly fertile. In the coves, however, and along the foot of the ridges, it is more productive, being less accumulated, and the soil is fertile.

Agriculture.- Corn is the principal field crop, and 20 bushels per acre are a good average yield. This land can not compete with the alluvial river bottoms, however. Most of it is turned only because it is cheap land. The higher altitudes are favored by fruit growers, and vegetables, and also to about raising in a limited degree, as cattle may roam in the woods and subsist on acorns, chestnuts, and roots, and hogs in occasional years find abundant meat.

As a rule the earth is fairly well covered and thus protected from erosion, but the few old pastures are bare and gullied bare, as elsewhere, on hilly land.

In this region streams heading in northern forest are notably clear and show little fluctuation, while those from cleared lands are muddy and inconstant. While present erosion is limited, there is evidence that it could be very great if large areas of the earth were removed.

The forest.- With the exception of a few "balds" or grassy areas on the higher ridges and the alluvial lands of the lower coves and creek valleys, the forest of this great mountain side is practically unbroken. The trees contain 928,150 board feet B.M. log timber, and 3,716,300 cords of small wood.

Over 100 species of trees grow here, an unusually large number for one locality. Northern and southern trees are close neighbors, and all may be seen between elevations of 1,500 to 3,700 feet. The proportions of timber species are as follows:

Proportions of timber species on northeastern slope of Smoky Mts.

	Per cent.
Oak	20
Ash	2
Hemlock	10
Yellow poplar	1
Black gum	2
Other species	15
Maple	5
Black plum	2
Chestnut	12
Spruce	2
Cherry	1
Beech	0
Hickory	2
	1

Proportions of timber species on northwestern slope of Smoky Mountains-Contd.

	Per cent.
White pine	3
Poplar	4
Cucumber	2
Linn	5
Birch	7
Locust	1

While some remarkable fine timber trees are here, the general average is far inferior to what might be grown with so favorable a soil and climate. Fire, grazing, and culling have reduced this forest considerably. Imperfect trees and inferior species are abundant, while some of the burns and cattle ranges are deficient in stand.

Hardly any other forest in the country would respond so readily to the forester's care and demonstrate so plainly that nearly all of this tract is best adapted to timber growing.

North Slope of White Rock Mountain (Cocke County, Tenn.).

Boundaries.- On the north, the foot of the mountain; on the east, Pigeon River; on the south, the mountain summit; and on the west, the eastern divide of Little Pigeon River and the north slope of Smoky Mountain, between Pigeon River and the eastern divide of the East Fork of Little Pigeon River.

Area.- Total, 32 square miles; cleared, 6.32 square miles; burned, 3.48 square miles; wooded, 22.20 square miles.

Surface.- Steep mountain slopes, frequently rocky and precipitous, grading into foothills deeply cut by watercourses.

Soil.- Light colored and shallow, except in a few coves.

Humus and litter.- Light. Much has been burned away by recent fires.

Agricultural value.- Corn, rye, and oats are light, except on some new ground in the coves. Fruits do well in the higher coves.

Timber trees.- Poplar, linn, ash, the oaks, red and sugar maple, gum, cherry, walnut, and cucumber, with some pine along the foothills. Merchantable timber is distributed among these species about in the order named.

Yield.- Log timber, 28,160 M. feet B.M.; small wood, 200,000 cords.

Demand.- Two dollars per thoudand feet on the stump is now paid for poplar. Other species mentioned above are cut in connection with poplar logging, but seldom bring more than 50 cents per thoudand feet.

Accessibility.- There is little or no log timber near the wagon roads. Logging, is difficult because of steep and brushy slopes.

Reproduction.- Free, except where much pastured or burned.

Proportions of timber species on northwestern slope of Douglas Mountains-Contd.

	Per cent.
White pine	2
Aspen	6
Lodgepole	1
Alder	8
Birch	7
Cottonwood	1

With some favorable fire timber trees are here, the general average is for timber so that might be grown with no favorable a soil and climate. Fire, grazing, and cutting have reduced this forest considerably. Important trees are timber species are abundant, while some of the burns and cutlis range are deficient in stand.

Hardly any other forest in the country would respond as readily to the forester's care and demonstrate so highly that nearly all of this tract is best adapted to timber growing.

Both slope of Little Bear Mountain (Cache County, Utah).

Boundaries.- On the north, the foot of the mountains; on the east, Ligon River; on the south, the accessible summit, and on the west, the western divide of Little Bear River and the northern slope of Bear Mountain, between Ligon River and the western divide of the last tract of Little Bear River.

Area.- Total, 32 square miles; classed, 8.32 square miles; burned, 0.13 square miles; wooded, 23.50 square miles.

Surface.- Very rough and precipitous, breaking into foothills nearly one up mountains, except in a few coves.

Soil.- Light colored and shallow, except in a few coves.

Timber and litter.- Light. Much has been burned away by recent fires.

Particular value.- Cove, yes, and cuts are light, except on some low ground in the coves. Trees do well in the higher coves.

Timber trees.- Douglas fir, aspen, the oaks, red and sugar maple, ash, elm, walnut, and cottonwood; these species about in the order named.

Distribution among these species about in the order named.

Yield.- Log timber, 22,150 B. feet B.M.; small wood, 200,000 cords.

Remarks.- The figures for thinned feet on the stump is any pole for poles. Other species mentioned above are out in connection with poles logging, but median point more than 50 cents per thousand feet.

Inaccessibility.- There is little or no log timber near the upper roads.

Logging difficulty.- Because of steep and brushy slopes.

Reproduction.- Free, except where much pastured or burned.

Second growth.- There is usually an abundant stand of saplings.

Undergrowth.- Dense laurel lines the bottoms. There are many seedlings elsewhere, except where closely pastured.

Rate of growth.- Rapid

Water power.- Abundant on the main creek.

Occupancy.- About 25 families are scattered along the lower course of the creek and in the coves about its head.

Briar Cove District (Sevier County, Tenn.).

Boundaries.- The divides comprising all of the drainage basin of the East Fork of Little Pigeon River above the mouth of Webb Creek.

Area.- Total, 65.32 square miles; cleared, 5 square miles; burned, 3 square miles, wooded, 57.32 square miles.

Surface.- Mountainous, with small areas along the river and in coves smooth enough to be arable.

Soil.- Very fertile in covers and along the river, but on ridges light and unproductive.

Humus and litter.- Abundant, except on the higher ridges and on some burns in the valley of the East Prong.

Agricultural value.- Most crops do well. Grass, corn, and fruit are the principal crops grown.

Timber trees.- Hemlock, 5 per cent; red oak, 5 per cent; scarlet oak, 6 per cent; poplar, 1 per cent; cherry, 2 per cent; peawood, 4 per cent; buckeye, 5 per cent; cucumber, 5 per cent; red maple, 6 per cent; sugar maple, 6 per cent; gum, 3 per cent; spruce, 5 per cent; beech, 3 per cent; yellow birch, 6 per cent; sweet birch, 6 per cent; linn, 5 per cent; chestnut, 10 per cent; and some white oak, black oak, butternut, walnut, and hickory.

Yield.- Log timber, 138,240 M feet B.M.; small wood, 400,000 cords.

Demand.- Poplar, ash, and cherry are worth $2.50 per thousand feet on the stump, while linn, buckeye, gum, maple, etc., bring only 50 cents per thousand feet.

Accessibility.- Portable mills are set near the uppermost clearings in the main valleys. The standing timber is nearly all above these points and difficult of access. The slopes are steep, and the roads must be rocky. The nearest shipping points are Newport and Sevierville.

Cutting.- The most accessible timber, including all the lower slopes, has been culled out. Some tan bark has been taken out, but much remains, as the prices have been too low.

Fire.- Most of the ridges have been burned over, and much of the timber on them has been killed and replaced by brush.

Reproduction.- Best adjoining clearings. In high altitudes there is too much brush.

Second growth.- Few good stands of saplings were seen, except on wood lots.

Undergrowth.- Laurel and other brush is usually dense.

Rate of growth.- Rapid. See general notes for trees measured here.

Water power.- Abundant; the river is large, rapid, and fairly constant.

Prices of land.- From $2 to $10 per acre.

Second growth.- There is usually an abundant stand of maplings.

Underbrush.- Dense layers like bottom. Place are deep leaf litter, except where clearly predated.

Depth of growth.- Rapid

Water power.- Abundant on the main creek.

Roads.- About 20 facilities are scattered along the lower course of the creek and in the course about the head.

Prior Cone Utilization (Winter Cutting).

Description.- The stations were taking all of the dominant stands of the right of the river above the south of the creek.

Area.- Total, 24.22 square miles; cleared, 0 square miles; burned, 3 square miles, modest, 17.22 square miles.

Density.- Very heterogenous, with small areas along the river and in areas modest around to be overall.

Soil.- Very fertile in covers and along the river, but on ridges light and unproductive.

Trees and Timber.- Abundant, except on the higher ridges and on some burns in the valley of the East Fork. Areas, corn, and fruit are the principal crops grown.

Principal species.- Most areas do well. 5 per cent; sugar oak, 5 per cent; poplar, 1 per cent; cherry, 2 per cent; basswood, 6 per cent; buckeye, 5 per cent; hickory, 5 per cent; red maple, 5 per cent; sugar maple, 5 per cent; sweet birch, 4 per cent; butternut, walnut, and elm, 3 per cent; yellow birch, 2 per cent; hemlock, 5 per cent; white oak, 10 per cent; red oak, 5 per cent; white fir, 5 per cent; chestnut, 10 per cent; and sycamore, willow fir, hickory, ash, maple, etc., being only 10 cents per thousand feet.

Yield.- Log timber, 1,240 board feet per acre; 2.00 per thousand feet or the equivalent, cord, one cherry are worth $2.00 per thousand.

Accessibility.- Favorable mills are not over the mountain clear-cut in the main valley. The standing timber is nearly all above these points and cliffs of coves. The slopes are steep, and the roads must be rough. The nearest shipping points are Bryant and Taylorville.

Cutting.- The most accessible timber, including all the lower slopes, has been cutting out. Some tan bark has been taken out, but much remains, as the prices have been kept low.

Fire.- Some of the slopes have been burned over, and much of the timber on these has been killed and replaced by brush.

Deterioration.- Most adjoining clearings.

Second growth.- Ten good stands of maplings were seen, except on good much brush.

Underbrush.- Laurel and other brush is usually dense.

Depth of growth.- Rapid. The general score for trees measured here.

Water power.- Abundant; the river is large, rapid, and fairly constant.

Prices of land.- Area $2 to $10 per acre.

Alum Cave Creek District (Sevier County, Tenn.).

Boundaries.- The divides comprising the entire drainage basin of West Pigeon River above the mouth of Dudley Creek.

Area.- Total, 35.48 square miles; cleared, 5 square miles; burned, 1 square mile; wooded, 29.48 square miles.

Surface.- Very steep mountain sides, except about 6 square miles of arable land near Sugarville and Gatlinburg.

Soil. - Fertile

Humus and litter.- Abundant

Agricultural value.- Grass, corn, and fruit do well. Small grains are grown, but corn is preferred.

Timber trees.- Yellow birch, 5 percent; sweet birch, 4 per cent; chestnut, 10 per cent; red oak, 8 per cent; chestnut oak, 10 per cent; white oak, 8 per cent; scarlet oak, 5 per cent; black oak, 2 per cent; sugar maple, 5 per cent; red maple, 3 per cent; buckeye, 8 per cent; cucumber, 4 per cent; poplar, 1 per cent; hemlock, 10 per cent; cherry, 1 per cent; gum, 2 per cent.

Yield.- Log timber, 57,778 M feet B.M.; small wood, 277,000 cords.

Demand.- Only the poplar, cherry, linn, ash, walnut, and peawood are considered of value. These sometimes bring $2 per thousand feet on the stump.

Accessibility.- Streams are not drivable, and the upper portions of the valleys are difficult for road making. The mountain slopes are steep and brushy.

Cutting.- The log timber that remains is not considered worth taking out.

Fire.- There are some scalds on ridges. About 500 acres are severly burned. Lighter fires have reduced the timber on the drier portions, yet the spruce is sparse and scrubby.

Reproduction.- Except for the fires, reproduction would be free. Peawood comes in abundantly on old pastures, and the oaks reappear quickly on the mountain sides.

Second growth.- Saplings are abundant and usually of the same species that occupied the ground before.

Undergrowth.- There is much laurel in ravines and huckleberry on the ridges.

Rate of growth.- Rapid.

Water power.- Abundant

Prices of land.- The best tracts of considerable size could be bought for $10 per acre.

Little River Basin Above Eli M'Carter's (Sevier County, Tenn.).

Area.- Total, 27,64 square miles; all wooded.

Surface.- Moderately mountainous. Many of the slopes are very steep; the bottoms are very narrow.

Soil.- Generally fertile.

Humus and litter.- Abundant.

Agricultural value.- Mostly too steep for cultivation. Probably 600 acres arable, on which corn, grass, and fruits would do well.

Timber trees.- Same as Alum Cave district, except more hemlock (13 per cent) and peawood (5 per cent).

Yield.- Log timber, 105,366 M feet B.M.; small wood, 353,792 cords.

Lion Creek District (Barber County, Tenn.).

Boundaries.- The divides separating the white drainage basin of West Creek from those of the south of Dodgy Creek.

Area.- Total, 55.46 square miles; cleared, 8 square miles; burned, 1 square mile; wooded, 25.46 square miles.

Land near surface and cutting s.:

Surface.- Very steep mountain sides, except about 6 square miles of gentle slopes.

Soil.- Porcelle.

Trees and litter.- Abundant.

Grass.- Grass, sedge, and fruit do well. Small grains are precarious, but corn is practiced.

Timber trees.- Yellow birch, 8 percent; sweet birch, 4 per cent; chestnut, 10 per cent; red oak, 8 per cent; chestnut oak, 10 per cent; white pine, 8 per cent; sugar maple, 5 per cent; hemlock, 8 per cent; black oak, 3 per cent; cucumber, 4 per cent; poplar, 1 per cent; beech, 10 per cent; cherry, 1 per cent; gum, 2 per cent.

Yield.- Log timber, 97,172 b.f.; small wood, 177,000 cords.

Remarks.- Only the poplar, cherry, lime, ash, walnut, and yellow wood are considered of value. These mountains bring 12 per thousand feet on the stump.

Accessibility.- Streams are not drivable, and the upper portions of the valleys are difficult for road making. The mountain slopes are steep and broken.

Outlook.- The lot timber that remains is not accessible enough taking out.

Fire.- Fires are seen again on ridges. About 600 acres are severely burned. Light fires have followed the timber on the drier portions, yet the spruce is sprouts and dry.

Reproduction.- Enough for the fires, reproduction would be free. Yellow poplar in abundance on old pastures, and the oaks reproduce quickly on the cleared lands.

Water power.- Abundant.

Prices of land.- The best tracts of considerable size could be bought for $10 per acre.

Little Elmer Basin Above Mill Creek's (Barber County, Tenn.).

Area.- Total, 27.64 square miles; all wooded.

Surface.- Moderately mountainous. Many of the slopes are very steep; the bottoms are very narrow.

Soil.- Generally fertile.

Grass and litter.- Abundant.

Agricultural value.- Hardly too steep for cultivation. Probably 600 acres arable, on which corn, grass, and fruits would do well.

Timber trees.- Same as Lion Cove district, except more hemlock (13 per cent) and peacood (5 per cent).

Yield.- Log timber, 105,366 b.f.; small wood, 382,782 cords.

Demand.- Although densely timbered with valuable species, the timber has no stumpage value.

Accessibility.- Difficult. The river below the flows through a crooked canyon about 15 miles before reaching drivable water near Tucaleechee Cove. Access by rail would require heavy grading.

Cutting.- No cutting has been done.

Fire.- A few small fires have occurred.

Reproduction.- The burns have been restocked with brush rather than with timber trees.

Second growth.- The forest is well supplied with saplings standing between the large old trees.

Rate of growth.- Rapid; the trees are very thrifty.

Water power.- Abundant.

Prices of land.- The whole basin could probably be bought for $1 to $5 per acre.

Jakes Creek Basin (Sevier County, Tenn.).

Area.- Total, 4.42 square miles; cleared, 0.50 square mile; burned, 1 square mile; wooded, 2.92 square miles.

Surface.- Hilly to mountainous; but few of the slopes are very steep.

Soil.- Fertile.

Humus and litter.- Abundant.

Agricultural value.- Very productive where cleared. Corn, grass, and fruits are the principal crops.

Timber trees.- Same as Alum Cave district, with the addition of gopherwood and holly.

Yield.- Log timber, 17,715 M feet B.M.; small wood, 40,000 cords.

Demand.- Stumpage values are low because access is difficult. Best export timber brings $2 per thousand feet on the stump.

Accessibility.- Naturally difficult. A fair wagon road has been built from Sevierville via Bear Valley. The slopes are steep and brushy.

Cutting.- Small mills have been operated for some years. One is now cutting the timber from the upper coves.

Fire.- Fires have run over most of the ridges, on which about half the trees are dead. The coves have escaped severe fire.

Reproduction.- Free. On recent burns there are many small seedlings.

Second growth.- The original forest is well supplied with saplings, but few are left on the burned areas.

Undergrowth.- Except in the ravines, where laurel is abundant, the underbrush has been reduced by fire and grazing.

Rate of growth.- Rapid.

Water power.- A stream 15 feet wide by 1 foot deep, with a swift current, falls rapidly through its entire course.

Prices of land.- From $2 to $5 per acre.

Little River Basin Below Eli M'Carter's (Sevier County, Tenn.).

Boundaries.- The divides comprising all of the land draining into the East Fork of the Little River below Eli McCarter's, except that draining into Jakes Creek.

Tamaul.- Although densely timbered with valuable species, the timber has no strongers value.

Lower Tilliter.- Difficult. The river below the flume through a crooked narrow work. It also carries resulting erosion under some Tuscaloosa Cove.

Average by rail would remain nearly flat.

Harbor.- No outlet has been done.

Tree.- Ice.really there been concerned.

Transportation.- The forms have been replanted with varied rubber than with lower class.

Second growth.- The forest is well supplied with anplsgr standing between the Lyre, all trees.

Site of town.- Despite the trees are very thickly.

Other farm.- Unknown.

Future of land.- The whole train could probably be bought for $1 to $5 per acre.

Lower Grove Basin (Lamar County, Tenn.).

Area.- Total, 4.69 square miles planned, 0.00 square miles burned, 1 square miles wooded, 2.69 square miles.

Surface.- Hilly to rolling; the low of the slopes are very steep.

Soil.- Fertile.

Trees and life.- Abundant.

Water.- Very pleasant low water clear.

Other trees.- Dogwood, redbud, and fruit are the principal trees.

Timber trees.- Some of the Cove district, with the addition of poplarwood and holly.

Size.- Jag timber, 17,710 feet B.M., small well, 40,000 cords.

Price.- Standing valuing are low because access is difficult. Such report timber bought by our lumbermen that on the study.

Accessibility.- Extremely difficult. A fair wagon road has been built from Jamesville via Lyre Valley. The slopes are steep and broken.

Cost.- Small mills have been operated for some years. The is now cutting the timber from the upper coves.

Fire.- Fires have run over much of the village, on which about half the trees are land. The coves have escaped severe fire.

Protection.- Free. In recent years there are many small meadings.

Second growth.- The original forest is well supplied with saplings, but for are left on the burned areas.

Timber growth.- Except in the ravines, where laurel is abundant, the undergrowth has been greatly reduced by fire and grazing.

Area of growth.- Rapid.

Value cover.- A stump 12 feet aline by 1 inch deep, with a main current fall is swiftly through the entire course.

Values of land.- From $1 to $5 per acre.

Little River Basin below Elk Mountain's (Warren County, Tenn.).

Boundaries.- The divides enclosing all of the land draining into the Elk port of the Little River below Elk Mountain's, except that draining into Lar Creek.

Area.- Total, 24.20 square miles; cleared, 0.56 square mile; wooded, 23.64 square miles.

Surface.- Very steep and rocky, except Little Greenbrier Cove, on the Wear Cove road.

Soil.- Light, except in coves.

Humus and litter.- Light; mostly consumed by fire.

Agricultural value.- Slight.

Timber trees.- Black pine, 7 per cent; red oak, 10 per cent; black oak, 4 per cent; chestnut oak, 5 per cent; ash, 2 per cent; scarlet oak, 10 per cent; white oak, 1 per cent; red maple 7 per cent; sugar maple, 10 per cent; birch, 10 per cent; peawood, 10 per cent; linn, 12 per cent; hemlock, 4 per cent; white pine, 0.5 per cent; cherry, walnut, butternut, and yellow wood constitute the remainder.

Yield.- Log timber, 29,747 M. feet B.M.; small wood, 178,000 cords.

Demand.- Stumpage prices for the best timber runs from $1 to $2 per thousand feet, where it is fairly accessible.

Accessibility.- Difficult. The slopes are steep and rocky, especially near river. A wagon road has been made, at great expense, from Wear Cove to Greenbrier Cove, then, crossing the river, passes through the coves near the sources of the western tributaries.

Cutting.- Portable mills have operated here and there along this road. Perhaps 10 per cent of the most valuable timber has been taken out.

Fire.- At least half of this tract is burned over annually. Most of the underbrush has been killed, except laurel, which is abundant along the streams.

Reproduction.- Free, except where repeatedly burned.

Second growth.- Deficient. Fires have been too frequent, and very little young stock is coming up, especially on the ridges.

Undergrowth.- Southern slopes are fairly free; northern slopes have some brush, but it is much reduced by fires.

Rate of growth.- Slow on ridges; fairly rapid in coves and along streams.

Water power.- Abundant along the river.

Prices of land.- From $2 to $5 per acre.

Middle and West Prongs of Little River Basins (Sevier and Blount Counties, Tenn.).

Boundaries.- The divides comprising the whole drainage basin above Tuckaleechee Cove, except that of Laurel Creek.

Area.- Total, 38.16 square miles; cleared, 0.23 square mile; burned, 2 square miles; wooded, 35.93 square miles.

Surface.- Mountainous; much of it very steep. The stream bottoms are narrow.

Soil.- Light.

Humus and litter.- Scant; mostly consumed by fire.

Agricultural value.- Slight. Even the clearings, supposed to be the best land, are not very productive.

Timber trees.- Hemlock, 12 per cent; white pine, 2 per cent; black pine, 1 per cent; chestnut oak, 10 per cent; chestnut, 10 per cent; white oak, 10 per cent; red oak, 4 per cent; scarlet oak, 10 per cent; black oak, 2 per cent; cherry, ash, and poplar together, 2 per cent; black gum, 5 per cent; sweet gum, 1 per cent; linn, 2 per cent; sugar maple, 10 per cent; red maple, 1 per cent; cucumber and hickory together, 2 per cent.

square miles.

Surface.- Very stony and rocky, except little Greenbriar Cove, on the near to road.

Soil.- Light, except in caves.

Timber and litter.- Light; mostly consumed by fire.

Agricultural value.- Slight.

Timber trees.- Black gum, 7 per cent; red oak, 10 per cent; black oak, 6 per cent; chestnut oak, 5 per cent; ash, 5 per cent; sugar maple, 10 per cent; hickory, 6 per cent; chestnut oak, 7 per cent; red maple, 5 per cent; beech, 6 per cent; white oak, 1 per cent; red maple, 7 per cent; tulip, 10 per cent; elm, 10 per cent; dogwood, 10 per cent; pecan, 10 per cent; white pine, 0.5 per cent; cherry, walnut, butternut, and yellow poplar constitute the remainder.

Cut.- Log timber, 23,347 B. feet B.M.; mostly wood, 172,30 cords.

Tanbark.- Stripped prices for the best timber run from 12 to 22 per thousand feet, where it is fairly accessible.

Accessibility.- Difficult. The slopes are steep and rocky, especially near river. A logging road has been made, at great expense, from near Cove to Greenbriar Cove, thence, crossing the river, parallel through the cove near the source of the western tributaries.

Cutting.- Portable mills have operated here and there along this road.

Damage in per cent of the most valuable timber has been taken out.

Fire.- In least half of this tract is burned over annually. Most of the undergrowth has been killed, except where repeatedly burned.

Reproduction.- Fair, except where repeatedly burned.

Second growth.- Patchiness. Fires have been too frequent, and very little young stock is coming up, especially on the ridges.

Undergrowth.- Southern slopes are fairly free; northern slopes have some growth, but it is much reduced by fires.

Rate of growth.- Slow on ridges; fairly rapid in coves and along streams.

Water power.- Abundant along the river.

Price of land.- From $5 to $5 per acre.

Middle and East Forks of Little Sitter-Basins (Davis and Blount Counties, Tenn.).

Boundaries.- The divides separating the whole drainage basin above Tuckaleechee Cove, except that of Laurel Creek.

Area.- Total, 28.19 square miles; cleared, 0.73 square mile; burned, 3 square miles; wooded, 23.46 square miles.

Surface.- Mountainous; much of it very steep. The stream bottoms are narrow.

Soil.- Light.

Timber and litter.- Heavy; mostly consumed by fire.

Agricultural value.- Slight. Even the clearings, supposed to be the best land, are not very productive.

Timber trees.- Hemlock, 12 per cent; white pine, 2 per cent; black gum, 10 per cent; chestnut oak, 10 per cent; chestnut, 10 per cent; white oak, 10 per cent; red oak, 4 per cent; scarlet oak, 10 per cent; black gum, 2 per cent; cherry, ash, and yellow poplar together, 2 per cent; red maple, 10 per cent; red maple, 1 per cent; lime, 2 per cent; sugar maple, 10 per cent; and hickory together, 2 per cent.

Yield.- Log timber, 117,056 M feet B. M.; small wood, 466,000 cords.

Demand.- Poplar and ash have been sold at 50 cents to $1 per thousand feet on the stump.

Accessibility.- The log timber that has been taken from this region has been floated down the river. This stream is the best driving stream along the northern slope of the Smoky Mountains. Splash dams were necessary to take out the soft woods that have been removed. The hard woods that remain must be hauled out.

Cutting.- Probably 50 per cent of the soft woods have been taken out.

Fire.- Nearly all the ridges have been burned over every year, killing much of the underbrush, injuring many timber trees, and deadening large areas.

Reproduction.- Free on cuttings that have not been burned. The burns are pastured, and seedlings are kept down. The pines come in most freely on such land.

Second growth.- Saplings are few, owing to burning and grazing.

Undergrowth.- Reduced by fire and grazing.

Rate of growth.- Slow on ridges, but rapid where moist.

Water power.- Abundant.

Prices of land.- Probably not more than $5 per acre would be asked for any considerable area.

Laurel Creek Basin (Blount County, Tenn.).

Area.- Total, 6.76 square miles; cleared, 0.50 square mile; severely burned, 0.32 square mile; wooded, 5.94 square miles.

Surface.- Moderately mountainous. About 1 square mile along the upper portion of the creek is arable.

Soil.- Of medium quality; light on the ridges.

Humus and litter.- Light on the ridges; abundant elsewhere.

Agricultural value.- About 1 square mile would be profitable under cultivation.

Timber trees.- White pine, 10 per cent; black pine, 6 per cent; the oaks, 40 per cent; the maples, 10 per cent; ash, 5 per cent; chestnut, 10 per cent; hemlock, 10 per cent; and other species, 9 per cent.

Yield.- Log timber, 18,624 M. feet B. M.; small wood, 67,000 cords.

Demand.- All the timber could be bought for 50 cents per thousand feet on the stump.

Accessibility.- Difficult. A rough and hilly wagon road leads to Tuckaleechee Cove and on to Maryville.

Cutting.- A small mill has been operated about 4 miles from the head of this stream, but at little or no profit. Several hundred thousand feet of lumber have been sawed.

Fire.- Many fires have been set along the road, and much of the forest near it has been killed. The remote portions are but slightly injured.

Reproduction.- Free where fires are not repeated. White pine comes in freely.

Second growth.- Saplings are abundant.

Rate of growth.- Medium to rapid.

Water power.- Limited. The stream is small.

Prices of land.- The whole tract could probably be bought for $1 per acre.

Yield.- Log timber, 117,065 M feet B. M.; small wood, 246,000 cords.

Remark.- Poplar and ash have been sold at 50 cents to $1 per thousand on the stump.

Accessibility.- The log timber has been taken from this region along the northern slope of the Sandy Mountains. Spiash dams were necessary to take the soft woods that have been removed. The hard woods that remain must be hauled out.

Cutting.- Probably 50 per cent of the soft woods have been taken out.

Fire.- Nearly all the ridges have been burned over every year, killing much of the underbrush; leaving only timber trees, and destroying large areas.

Reproduction.- Free on outcrops that have not been burned. The burns are pastured, and seedlings are kept down. The pines come in most freely on open land.

Second growth.- Seedlings are left, owing to burning and grazing.

Topography.- Mostly by fire and grazing.

Rate of growth.- Slow on ridges, but rapid where moist.

Water power.- Abundant.

Prices of land.- Probably not more than $5 per acre would be asked for any considerable area.

Laurel Creek Basin (Blount County, Tenn.).

Area.- Total, 6.75 square miles; cleared, 0.50 square mile; severely burned, 0.25 square mile; wooded, 5.94 square miles.

Surface.- Moderately rough terrain. About 1 square mile along the upper portion of the creek is arable.

Soil.- Of medium quality; light on the ridges; abundant elsewhere.

Burns and litter.- Light on the ridges; abundant elsewhere.

Merchantable value.- About 1 square mile would be profitable under cultivation.

Timber trees.- White pine, 10 per cent; black pine, 5 per cent; the oaks, 40 per cent; the maples, 10 per cent; ash, 3 per cent; chestnut, 10 per cent; hemlock, 10 per cent; and other species, 5 per cent.

Yield.- Log timber, 18,664 M. feet B. M.; small wood, 47,000 cords.

Remark.- All the timber would be bought for 50 cents per thousand feet on the stump.

Accessibility.- Difficult. A rough and hilly wagon road leads to Tuckaleechee Cove and on to Townsville.

Cutting.- A small mill has been operated about 4 miles from the head of this stream; but at little or no profit. Several hundred thousand feet of timber have been sawed.

Fire.- Many fires have been set along the road, and much of the forest near it has been killed. The remote portions are but slightly injured.

Reproduction.- Free where fires are not repeated. White pine comes in freely.

Second growth.- Seedlings are abundant.

Rate of growth.- Medium to rapid.

Water power.- Limited. The stream is small.

Prices of land.- The whole tract could probably be bought for $1 per acre

CADES COVE DISTRICT (BLOUNT COUNTY, TENN.).

Boundaries.- The divide comprising all of the drainage basin above the junction Cove and Forge Creeks.

Area.- Total, 37,62 square miles; cleared 7.08 square miles; burned, 0.24 square mile; woodland, 30.30 square miles.

Surface.- A large, wide valley of rolling land, surrounded by mountains having steep slopes, which merge into foothills of moderate slope near the bottom.

Soil.- Light, except in coves. In the valley is much so-called "dead land", where the soil seems to contain some ingredient unfavorable to plant growth. The areas of this sort are not large, however.

Humus and litter.- Usually light, owing to repeated fires and much grazing.

Agrucultural value.- The large area of arable land, practically all of which is cleared, produces much less than one would expect. The coves about the foot of the mountains, however, are quite productive, yielding fair crops of corn and grass.

Timber trees.- Chestnut 30 per cent; chestnut oak, 20 per cent; hemlock, 12 per cent; white pine, 12 per cent; sugar maple, 6 per cent; red gum, 4 per cent; black birch, 4 per cent; black oak, 6 per cent; and others, 6 per cent;

Yield.- Log timber, 96,960 M feet B. M.; small wood, 291,00 cords.

Demand.- There is no demand except for local use, and the timber has practically no stumpage value.

Accessibility.- The nearest shipping point is Maryville, and two mountain ranges have to be crossed to reach the railroad. The timber land itself, however, is not especially difficult of access.

Cutting.- There has been very little cutting, except for local use. The large proportion of the timber has been burned in clearing.

Fires.- Fires are set whenever they will run, and the forest shows the effect of this practice. The brush is subdued; the timber is frequently scorched at the butt, often killed.

Reproduction.- Seedlings are kept down by cattle and fires, except on a few old fields, where thrifty pines and oaks are abundant.

Second growth.- Abundant saplings promise better timber than the original forest. These must have started at a time when fires were less prevalent than now.

Undergrowth.- Reduced by burning and grazing.

Rate of growth.- Rapid, except on ridges.

Water power.- The streams are small. The largest, where leaving the tract, was about 25 feet wide and 1 foot deep September 1, 1900.

Ownership.- The resident population hold the cleared land and perhaps as much woodland adjoining. There are perhaps 140 families resident on this tract.Prices of land.- The best farm in the valley can be bought for $5 per acre. Fifty cents an acre is considered a good price for mountain land.

ABRAM CREEK DISTRICT (BLOUNT COUNTY, TENN.).

Boundaries.- The divides comprising all the land drained by the stream, except Cades Cove, above the forks of Cove and Forge creeks and the south slope of Chilhowee Mountain.

Area.- Total, 49.14 square miles; cleared, 1.92 square miles; woodland, 47.22 square miles.

DARK COVE DISTRICT (BLOUNT COUNTY, ILL.).

Boundaries.- The divide comprising all of the drainage basin above the junction Dove and Pope Creeks.

Area.- Total, 37.62 square miles; cleared 7.00 square miles; burned, 0.24 square mile; woodland, 29.30 square miles.

Surface.- A large, wide valley of rolling land, surrounded by mountains having steep slopes, which merge into foothills of moderate slope near the bottom.

Soil.- Light, sandy to loess. In the valley is good so-called "dead land", where the soil seems so mountain some impoverished unfavorable to plant growth. The areas of white sand are not large, however.

Trees and litter.- Usually light, owing to repeated fires and much grazing.

Agricultural value.- The large area of arable land, practically all of which is cleared, produces much less than one would expect. The corn about the foot of the mountains, however, are quite productive, yielding fair crops of corn and grass.

Timber trees.- Chestnut 30 per cent; chestnut oak, 20 per cent; hickory, 12 per cent; white pine, 12 per cent; sugar maple, 6 per cent; red gum, 4 per cent; black birch, 4 per cent; black oak, 4 per cent; small wood, 221,00 cords.

Yield.- Log timber, 99,000 board feet B. M.; small wood, 221,00 cords.

Demand.- There is no demand except for local use, and the timber has practically no stumpage value.

Accessibility.- The nearest shipping point is Maryville, and two wagonroads require one to be crossed to reach the railroad. The timber land itself, however, is not especially difficult of access.

Fuelling.- There has been very little cutting, except for local use. The large proportion of the timber has been burned in clearing.

Fires.- Fires are not numerous; they will run, and the forest shows the effect of this practice. The brush is watched; the timber is frequently scorched by the heat, often killed.

Depredation.- Conditions are kept down by cattle and fires, except near the old fields, where thrifty pines and oaks are abundant.

Second growth.- Abundant sapling growths better timber than the original forest. Fires must have started at a time when fires were less prevalent than now.

Undergrowth.- Reduced by burning and grazing.

Lack of growth.- Small, except on ridges. The largest, where leaving the trees about 15 feet alike and 1 foot deep December 1, 1900.

Water power.- The streams are small.

Ownership.- The resident population held the cleared land and perhaps as much woodland adjoining. There are perhaps 140 families resident on this tract. The best land in the valley can be bought for $5 per acre.

Value.- Acre in area is considered a good price for mountain land.

DARK COVE DISTRICT (BLOUNT COUNTY, TENN.).

Boundaries.- The divides comprising all the land drained by the streams, except Dark Cove, above the forks of Cove and Pope creeks and the south slope of Chilhowee Mountain.

Area.- Total, 49.14 square miles; cleared, 1.02 square miles; woodland, 47.22 square miles.

Surface.- Hilly to mountainous, with very small arable areas in valleys (about 2 square miles).

Soil.- Very light on ridges. Moderately fertile in valleys and coves.

Humus and litter.- Light. Nearly all consumed by the numerous fires.

Agricultural value.- Very slight, except in the few narrow bottoms and small coves. Not over 1,300 acres adapted to agriculture.

Timber trees.- White pine, 20 per cent; hemlock, 10 per cent; black pine 10 per cent; scarlet oak, 10 per cent; black oak, 2 per cent; white oak, 5 per cent; red oak, 5 per cent; chestnut, 12 per cent; chestnut oak, 10 per cent; poplar; cherry, and ash together, 2 per cent; maple, 2 per cent; birch, 2 per cent; cucumber, peawood, hickory, and others, 10 per cent.

Yield.- Log timber, 90,662 M feet B. M.; small wood, 302,000 cords.

Demand.- The best price has been $1 per thousand feet on the stump.

Accessibility.- Most of this land is difficult of access. There are no special obstructions to railroad building, however.

Cutting.- Very little cutting has been done, except along the lower portion of the stream.

Fire.- Fires are very frequent. Many trees have been injured or killed, but no large areas are entirely deadened.

Reproduction.- Very scant, owing to the numerous fires and the close grazing. On moist land seedlings come in quite freely, the pines most abundant of all.

Second growth.- Fair in hollows, but slow on ridges.

Undergrowth.- Very little

Rate of growth.- Fair in hollows, but slow on ridges.

Water power.- Several good mill sites are along the lower stream, especially near the mouth.

Prices of land.- The best farms are offered at $5 per acre, Most of the woodland can be bought for 50 cents per acre.

OCONALUFTY RIVER BASIN ABOVE FORKS (SWAIN COUNTY, N.C.)

Boundaries.- The divides, including the entire drainage basin above the forks of the river.

Area.- Total, 140 square miles; cleared, 5 square miles; wooded, 135 square miles; severely burned, 3 square miles.

Surface.- The area is very rough and rugged. The valleys are narrow, and, except on Mingus Mill Creek, there are almost no alluvial bottom lands. The divides between the different tributaries of the river are high, with steep slopes, which begin at the very banks of the streams. There are extensive areas strewn with great fragments of rock, and cliffs and precipitous banks are frequent.

Soils.- Loams and sandy loams are the common soils on the slopes and in the narrow bottoms. Where not too course and gravelly they produce well until the organic matter is exhausted.

Humus and litter.- There is a deep accumulation of leaf mold in the deep hollows at the heads of the streams where there has been no fire, but on all the drier land, especially that at a low elevation and on south slopes, it is deficient.

Agricultural value.- Corn is the staple crop; though some oats and a small amount of wheat are grown on some of the sandy alluvia, the soils are too light to render grain a profitable crop or farming a very profitable business. Apples and peaches do well in certain places.

Timber trees.- Mixed hardwoods, with hemlock, and, near the heads of the streams, spruce, compose the forest. About 70 per cent of the stand is oak and chestnut.

Yield.- The forest will cut more than 3,000 feet B. M. per acre, except on the dry slopes in the lower part of the valley.

Demand.- There is no demand except for shipping lumber, and only for the best grades of that, which command about 50 cents per thousand feet on the stump.

Accessibility.- The nearest point in the basin is more than 15 miles from the Asheville and Murphy Branch of the Southern Railway, over a rough road, which, however, could cheaply be improved. A railroad could easily be constructed up the river to the forks and several miles beyond up either fork.

Cutting.- Some cutting has been done on Raven Fork, and several small areas on the left fork have been culled. Only one mill is at present in operation, but it is stated that a company which has purchased one of the largest areas is to construct a railroad.

Undergrowth.- A great part of the area is destitute of undergrowth, but on many of the colder slopes there are dense thickets of laurel or Kalmia.

Reproduction.- Groups of young trees are frequent over nearly all the area that has been burned, appearing in open places where old trees have been killed or whetever the light conditions are suitable. These groups consist chiefly of oak, chestnut, and maple, though other hard woods are not uncommon. There are many clumps of young trees beneath the shade of the spruce which would grow rapidly if the cover were removed. The large areas of open forest, where there is no young growth, would readily restock naturally if afforded protection. This condition chiefly prevails on the lands of the Cherokee Indians.

Rate of growth.- At lower elevations the growth is rapid, but it decreases toward the summits of the high mountains.

Water power.- The streams are all rapid and there are many sites for dams, but the volume of water is not large enough in any stream to yield a large power.

Ownership.- The largest areas of forest land are the 20,000 acres in the reservation of the Cherokee Indians; the Howell tract of 10,000 acres; and the Whittier tract, about 7,000 acres of which are on this stream.

Occupancy.- There are only about 70 families on this portion of the river, and most of these are in the Indian settlement on Raven Fork.

Prices of land.- Farming land sells at $5 to $25 per acre; woodland, at $2 to $5 per acre.

OCONALUFTY RIVER BASIN BELOW FORKS (SWAIN COUNTY, N. C.).

Boundaries.- This area embraces all of the drainage basin below the forks of the river, except the valley of Soco Creek.

Area.- Total, 29 square miles; cleared, 9 square miles; wooded, 20 square miles.

Surface.- Narrow alluvial bottoms, or in a few places fairly large ones of 50 or more acres, border a great part of the river. Beyond these lie a narrow belt of hills with many gentle slopes, from which rise steep and rough mountains.

Soils.- The soils of the mountains and hills in the upper part of the area are sandy, being derived from sandstones and quartzite. On the hills in the lower part of the basin red clays and red loams, derived from schists and fine-grained sandstones, prevail. The alluvials are sandy and often coarse grained.

Timber stand.- Mixed hardwoods, with hemlock, and, near the heads of the streams, spruce, occupies the forest. About 70 per cent of the stand is oak and chestnut.

Yield.- The forest will cut more than 3,000 feet B. M. per acre, except on the dry slopes in the lower part of the valley.

Demand.- There is no demand except for shipping timber, and only for the best grades of that, which command about 50 cents per thousand feet on the stump.

Accessibility.- The nearest point in the basin is more than 15 miles from the Lumberville and Bridgeville branch of the Baltimore Railway, over a rough road, which, however, could obviously be improved. A railroad could easily be constructed up the river to the Forks and several miles beyond up either fork.

Cutting.- Some cutting has been done on Raven Fork, and several small areas on the left fork have been cutted. Only one mill is at present in operation, but it is stated that a company which has purchased one of the largest areas is to construct a railroad.

Undergrowth.- A great part of the area is destitute of undergrowth, but on many of the colder slopes there are dense thickets of laurel or leimia.

Reproduction.- Groups of young trees are frequent over nearly all the area that has been burned, especially in open places where old trees have been killed or whatever the light conditions are suitable. These groups consist chiefly of oak, chestnut, and maple, though other hard woods are not uncommon. There are many clumps of young trees beneath the shade of the spruce which would grow rapidly if the some were removed. The large areas of open forest, where there is no young growth, would readily restock naturally if effective protection.

This condition chiefly prevails on the lands of the Cherokee Indians.

Rate of growth.- At lower elevations the growth is rapid, but it decreases toward the summits of the high mountains.

Water power.- The streams are all rapid and there are many sites for dams, but the volume of water is not large enough in any stream to yield a large power.

Ownership.- The largest areas of forest land are the 20,000 acres in the reservation of the Cherokee Indians; the Kowall tract of 10,000 acres; and the Whitter tract, about 7,000 acres of which are on this stream.

Occupancy.- There are only about 70 families on this portion of the river, and most of these are in the Indian settlement on Raven Fork.

Prices of land.- Farming land sells at $5 to $15 per acre; woodland, at $2 to $5 per acre.

COCKLEBURY RIVER BASIN WATER SHEDS (MARS COUNTY, N. C.).

Boundaries.- This area embraces all of the drainage basin below the forks of the river, except the valley of Soco Creek.

Area.- Total, 29 square miles; cleared, 9 square miles; wooded, 20 square miles.

Surface.- Narrow alluvial bottoms, or in a few places fairly large ones of 50 or more acres, border a great part of the river. Beyond these lie a narrow belt of hills with many gentle slopes, from which rise steep and rough mountains.

Soils.- The soils of the mountains and hills in the upper part of the area are sandy, being derived from sandstones and quartzite. On the hills in the lower part of the basin red clays and red loams, derived from schists and fine grained sandstones, prevail. The alluvials are sandy and often coarse gravel

Humus and litter.- In most places leaf mold is scant, as the prevailing exposure is southerly, but on fertile slopes and in the deep hollows it has accumulated to a greater depth.

Agricultural value.- The sandy alluvials and the red soils are fairly productive, yielding corn, small grain, clover, and peas, but will not long remain set in grass. The gray, sandy soils do not wear well and soon become thin. There are a few silty alluvia of fine producing capacity.

Timber trees.- The oaks, yellow and black pines, chestnut and hickory, in relative abundance about in the order named, from the greater portion of the forests, except in the hollows, where typical Appalachian hard woods prevail.

Yield.- Average, 1,700 feet B. M. per acre.

Demand.- While there is no local demand, the nearness to the railroad renders most of the best timber merchantable.

Accessibility.- The center of the valley is about 7 miles from the Southern Railway, by means of a fair wagon road, which could easily be improved.

Cutting.- No mills are in operation at present, but much of the best timber has been cut and shipped.

Second growth.- Scarlet, white, and black oaks, shortleaf and black pines, and hickory form most of the second growth, which is abundant only in the vicinity of the larger and older settlements.

Undergrowth.- With the exception of groups of young trees and occasional clumps of Kalmia or other shrubs, undergrowth is scant.

Reproduction.- Groves of young trees are frequent in culled woods, showing that the forests will readily regenerate.

Rate of growth.- On account of the prevailing thin, dry soil, accretion is rather slow.

Water power.- There are numerous sites for small dams. The run-off is rapid, and short periods of very high water are frequent, following heavy rainfall in the mountains.

Ownership.- The Eastern band of the Cherokee Indians owns a large portion of the mountain land. The rest of the land is divided into numerous small holdings.

Occupancy.- There are about 80 families living on this part of the river.

Prices of land.- Farming land sells at $6 to $30 per acre; woodland, at $1 to $5 per acre.

TWENTY MILE CREEK (SWAIN COUNTY, N. C.)

Area.- Total, 24 square miles; cleared, 0.5 square mile; wooded, 22.5 square miles; severely burned, 1 square mile.

Surface.- The entire basin is broken into steep hills or rugged mountains, with some very small bottoms about the middle of the basin.

Soils.- The soils are generally sandy and rather coarse grained, but they seem to be well suited to forest growth.

Humus and litter.- In the deep hollows and on north slopes there is an accumulation of leaf mold. In some places it is very deep. On the lower hills near the mouth of the stream and on many of the dry southern slopes, especially such as have been burned, it is often very scant.

Agricultural value.- The soils are not productive, though when first cleared they produce good crops of corn and grass. They are too steep, however, and to sandy to work well agriculturally.

Humus and litter.- In most places leaf mold is scant, as the prevailing
[illegible] is scarcely, but on ridgetops slopes and in the deep hollows it has
accumulated to a greater depth.

Agricultural value.- The sandy alluvials and the red soils are fairly
productive, yielding corn, small grain, clover, and peas, but will not long
remain set in grass. The gray, sandy soils do not wear well and soon become
thin. There are a few silty alluvia of fair producing capacity.

Timber trees.- The oaks, yellow and black yrnes, chestnut and hickory, in
relative abundance stand in the order named. From the greater portion of the
forests, except in the hollows, where cyclical [illegible] hard wood prevail.

Yield.- Average, 1,000 feet B. M. per acre.

Demand.- While there is no local demand, the resources to the railroad
renders most of the best timber merchantable.

Accessibility.- The center of the valley is about 7 miles from the nearest
railway, by means of a fair wagon road, which could easily be improved.

Outlook.- So soils are in operation at present, but much of the best timber
has been cut and stripped.

Second growth.- Scarlet, white, and black oaks, shortleaf and black pines,
and hickory form most of the second growth, which is abundant only in the
vicinity of the larger and older settlements.

Undergrowth.- With the exception of groves of young trees and occasional
clumps of laurel or other shrubs, undergrowth is scant.

Reproduction.- Groves of young trees are frequent in cutlog woods, showing
that the forests will readily regenerate.

R to of growth.- On account of the prevailing hilly, dry soil, succession is
rather slow.

Water power.- There are numerous sites for small dams. The run-off is
rapid, with short periods of very high water and frequent, following heavy rain-
fall in the mountains.

Ownership.- The eastern half of the Cherokee Indians own a large portion
of the mountain land. The rest of the land is divided into numerous small
holdings.

Occupancy.- There are about 60 families living on this part of the river.

Prices of land.- Farming land sells at $8 to $30 per acre; woodland, at $1
to $6 per acre.

TWENTY MILE CREEK (HAIN COUNTY, N. C.)

Area.- Total, 24 square miles; cleared, 0.5 square mile; wooded, 22.5
square miles; severely burned, 1 square mile.

Surface.- The entire basin is broken into steep hills or rugged mountains,
with some very small bottoms about the middle of the basin.

Soils.- The soils are generally sandy and rather coarse grained, but they
seem to be well suited to forest growth.

Humus and litter.- In the deep hollows and on north slopes there is an
accumulation of leaf mold. In some places it is very deep. On the lower hills
near the south of the stream and on many of the dry southern slopes, especially
such as have been burned, it is often very scant.

Agricultural value.- The soils are not productive, though when first clear-
ed they produce good crops of corn and grass. They are too stony, however, and
to sandy to work well agriculturally.

Timber trees.- The basin is generally lightly timbered, though in the coves and on the north slopes at the upper part of the basin there are some small areas of very heavy timber. Oak, chestnut, and hickory form the greater part of the growth on the slopes; while with these are associated birch and maple, with some ash, linn, and hemlock in the hollows and in other cool moist situations. There is some yellow pine, but its commercial importance is slight.

Yield.- The yield is not more than 2,000 feet B. M. per acre.

Demand.- There is at present no demand, as the distance from the nearest railroad station makes remunerative sawing impossible.

Accessibility.- The mouth of the stream is 20 miles distant, both from Maryville, Tenn., and Bushnell, N. C. There is a rough road for 4 miles up the stream which could easily be improved.

Cutting.- There are no mills at present in operation. Some of the best timber has been cut and floated down the Tennessee River to Chattanooga. As the river between the mouth of this stream and Chilhowee, Tenn., is extremely rough, where it breaks through the Smoky Mountains, many logs are badly split in going through, and there is often a great loss of stranded logs below, Chilhowee.

Second growth.- There is no second growth of importance.

Undergrowth.- There is considerable undergrowth on some slopes, especially where there have been ancient fires, and many shoots have sprung up from the stools of young fire-killed trees. In places are Kalmia thickets, but there are not enough of these, nor are they dense enough to present any serious impediment to logging, except at the head of the stream in a few of the deep coves.

Reproduction.- Groves of young trees, some apparently seedlings and others evidently stool sprouts, are frequent in woods that have been burned.

Rate of growth.- Accretion is fair, except on the thin, dry soil of south slopes. In the cell, moist hollows it is good.

Water power.- There are numerous sites for dams. In some places they could easily be built from 20 to 40 feet in height, where there are steep slopes on either side of the creek. Good buildings sites, however, are few. The amount of power that could be secured would in any event not be very large.

Occupancy.- There is only one family at present living on the stream.

Prices of land.- Lands are held at about $2.50 per acre. It has been reported that valuable mineral deposits have been found on the stream.

EAGLE CREEK BASIN (SWAIN COUNTY, N. C.)

Area.- Total, 94 square miles; cleared, 60 acres; wooded, 34 square miles severely burned, 2 square miles.

Surface.- The surface is very rough, especially at and near the mouth of the creek where the basin is constricted by steep and rugged cliffs, and at the upper part where the mountains are steep and rocky. In the middle part of the basin, where the creek forks, there are some gentle slopes which lie well for cultivation.

Soils.- The soils are largely derived from slates and quartzite; in some places they are sandy, but are generally very good for forest growth.

Humus and litter.- The prevailing forest floor is a deep leaf mold. It is often absent or scant on south slopes or where fires are prevalent.

Agricultural value.- Considering the general steepness, the land will probably yield good crops of corn, grass, apples, potatoes, and other produce. Much of the land in the coves seems to be fertile.

Timber trees.- The basin is generally lightly timbered, though in the coves and on the north slopes at the upper part of the basin there are some small areas of very heavy timber. Oak, chestnut, and hickory form the greater part of the growth on the slopes, while with these are associated birch and maple, with some ash, elm, and hemlock in the hollows and in other cool moist situations. There is some yellow pine, but its commercial importance is slight.

Yield.- The yield is not more than 2,000 feet B. M. per acre.

Roads.- There is at present no demand, as the distance from the nearest railroad station makes transportation seemingly impossible.

Accessibility.- The mouth of the stream is 20 miles distant, both from Murphy, Ga., and Tusmalli, N. C. There is a rough road for 2 miles up the stream which could easily be improved.

Driving.- There are no mills at present in operation. Some of the best timber has been cut and floated down the Tennessee River to Chattanooga. At the river between the mouth of this stream and Hiwassee, many logs are held until in going where it breaks through the Smoky Mountains, many logs are held until in going through, and there is often a great loss of stranded logs below Hiwassee.

Second growth.- There is no second growth of importance.

Underbrush.- There is considerable undergrowth on some slopes, especially where there have been recent fires, and many shoots have sprung up from the stumps of young fire-killed trees. On slopes are certain thickets, but there are not enough of these, nor are they large enough to present any serious impediment to logging, except at the head of the streams in a few of the deep coves.

Depredations.- Grazing of young trees, some apparently resulting and others evidently about apparents, are frequent in areas that have been burned.

Date of growth.- Accretion is rapid, except on the thin, dry soil of south slopes. In the coves, moist soil holders it to good.

Water power.- There are numerous sites for dams. In some places they could easily be built from 20 to 40 feet in height, where there are steep slopes on either side of the creek. Good buildings sites, however, are few. The amount of power that could be secured would in any event not be very large.

Occupancy.- There is only one family at present living on the stream.

Prices of land.- Lands are held at about $2.50 per acre. It has been reported that valuable mineral deposits have been found on the stream.

SWAIN COUNTY BLOCK (SWAIN COUNTY, N. C.)

Area.- Total, 64 square miles; cleared, 30 acres; woods, 64 square miles; swampy ground, 2 square miles.

Surface.- The surface is very rough, especially at and near the mouth of the creek where the basin is constricted by steep and rugged cliffs, and at the upper part where the sandstone are steep and rocky. In the middle part of the basin, where the creek forks, there are some gentle slopes which lie well for cultivation.

Soils.- The soils are largely derived from slates and weathered in some places they are sandy, but are generally very good for forest growth.

Forest and timber.- The prevailing forest floor is a deep leaf mold. It is often covered or broad on south slopes or where fires are prevalent.

Agricultural value.- Considering the general steepness, the land will probably yield good crops of corn, grass, apples, potatoes, and other produce. But of the land in the cove seems to be fertile.

Timber trees.- Oak and chestnut are the predominant trees throughout the basin. On the lower part white pine and hickory are associated with them. On the upper part, especially in the deep hollows which indent the slopes of the Smoky Mountains and the great ridges which spring from it, poplar, ash, hemlock, birch, maple, and buckeye are associated with the oaks and chestnut.

Yield.- Three thousand to four thousand feet B. M. per acre is the yield on the best land on the upper part of the creek. The land of the lower part is less heavily timbered.

Demand.- There is at present no demand for lumber, as the distance from transportation facilities and the absence of roads prevent shipment.

Accessibility.- There is no road on the creek, only ~~bridlex~~ bridle paths leading to the farms. A very rough road up Tennessee River leads from the mouth of the creek to Bushnell, the nearest station on the Southern Railway.

Second growth.- Second growth is scant, except in a few places where there have been fires.

Reproduction.- Reproduction is generally good, and there is in many places a heavy growth of saplings beneath the old trees.

Rate of growth.- Accretion is good, especially in the hollows.

Water power.- The stream is too small to yield more than a slight power although it has a great fall.

Ownership.- The greater part of the basin is held in one body.

Occupancy.- There are only 2 families living on the stream.

Prices of land.- Land is said to be held at $2.50 per acre.

Hazel Creek Basin (Swain County, N. C.).

Area.- Total, 52 square miles; cleared, 3 square miles; wooded 49 square miles; severely burned, 3 square miles.

Surface.- The basin lies between two of the southern spurs of the Smoky Mountains. For several miles above its mouth the stream flows through a gorge. Nearer its head it forks several times and the basin broadens, but the mountain slopes, which rise from the brink of the stream, are with few exceptions steep and rough.

Soils.- Slates, sandstone, and quartzite form the country rock and yield loose or sandy-loam soils, often coarse grained and rocky, shallow, except at the heads of the hollows, and only moderately fertile. There are no alluvial lands.

Humus and litter.- In the lower part of the basin, and where the woodland is closely pastured and frequently burned, and on many south slopes above, leaf mold is scant. In the deep hollows and on north slopes in the upper part of the valley the soil is protected by a deep accumulation of humus.

Agricultural value.- The soils are too sandy and the slopes are generally too steep and rocky to be extensively used agriculturally, though there are a few areas which are suitable for permanent farms. The common crops of the region do well where the soil is fertile.

Timber trees.- Below the forks of the creek oaks, chestnut, and hickory, in relative abundance in the order named, compose the forest. Above the forks chestnut and oaks are associated with birch, maple, hemlock, and linn. There is some spruce at high elevations.

Yield.- The yield is more than 3,000 feet B. M. per acre, except on the lower part of the stream.

Demand.- On account of the distance to the nearest railroad point only the choicest trees are cut, and sell at 50 cents to $2 per thousand feet on the stump.

Timber trees.- Oak and chestnut are the predominant trees throughout the basin. On the lower part white pine and hickory are associated with them. On the upper part, especially in the deep hollows which intent the slopes of the mountains and the great valleys which cross the main and chestnut, birch, maple, and hemlock are associated with the oak and chestnut.

Yield.- Trees thousand to four thousand board feet B. M. per acre is the yield on the best land on the upper part of the creek. The land of the lower part is less heavily timbered.

Roads.- There is at present no demand for lumber, as the distance from transportation facilities and the absence of roads prevent a market.

Accessibility.- There is no road on the creek, only bridges bridle paths leading to the ridge. A very rough road up Tamarack Run leads from the south of the creek to Sunbury, the nearest station on the Southern Railway.

Second growth.- Second growth is scant, except in a few places where there have been fires.

Reproduction.- Reproduction is generally good, and there is in many places a heavy growth of saplings beneath the old trees.

Rate of growth.- Growth is good, especially in the hollows.

Water power.- The stream is too small to yield more than a slight power although it has a great fall.

Capacity.- The greater part of the basin is held in one body.

Ownership.- There are only 2 families living on the stream.

Prices of land.- Land is said to be held at $8.00 per acre.

Basal creek basin (Pasin County, N. C.).

Area.- Total, 22 square miles; cleared, 2 square miles; woodland, 20 square miles; barren, 3 square miles.

Topography.- The basin lies between two of the northern spurs of the Smoky mountains. The general miles above its mouth the stream flows through a gorge. Near its head it forks several times and the basin broadens, but the mountain slopes, which rise from the brink of the stream, are with few exceptions steep and rough.

Soils.- Slates, sandstones, and quartzite form the country rock and yield loose or sandy-loam soils, often coarse gravelly and rocky, shallow, except at the heads of the hollows, and only moderately fertile. There are no alluvial lands.

Grass and litter.- In the lower part of the basin, and where the woodland is closely pastured and frequently burned, and on many south slopes above, land cold is scant. In the deep hollows and on north slopes in the upper part of the valley the soil is protected by a deep accumulation of grass.

Agricultural value.- The soils are too steep and the slopes are generally too stony and rocky to be productive land agriculturally, though there are a few areas which are available for pasture farms. The average crops of the region do well where the soil is fertile.

Timber trees.- Below the forks of the creek oak, chestnut, and hickory, in relative abundance in the order named, compose the forest. Above the forks chestnut and oaks are associated with birch, maple, hemlock, and ash. There is some spruce at high elevations.

Yield.- The yield is more than 3,000 feet B. M. per acre, mostly on the lower part of the stream.

Demand.- On account of the distance to the nearest railroad point only the choicest trees are cut, and sell at 50 cents to $2 per thousand feet on the

Accessibility.- There is no good road down the lower part of the valley. The main road turns across the southern end of Forneys Ridge to Bushnell, on Little Tennessee River, 8 miles above the mouth of the creek; this is the nearest station on the Asheville and Murphy Branch of the Southern Railway. Rough roads extend up both branches of the stream nearly to its head.

Cutting.- One small mill is in operation, cutting oak, yellow poplar, and ash. Some cutting has been done to within 5 miles of the head of the stream.

Second growth.- Oak, hickory, maple, and chestnut form the second growth, which is scant.

Undergrowth.- Thickets of laurel, rhododendron, and other shrubs often occur at high elevations.

Reproduction.- Under existing conditions oak and chestnut reproduce freely from seed, other species less. Most of the hard woods, if small, regenerate by stool shoots when killed by fire.

Rate of growth.- Accretion is normal for the aspect and altitude.

Water power.- This stream is too small to afford more than a limited power at any one place.

Occupancy.- There are 17 families living on the stream.

Prices of land.- Forest land sells at $2 to $6 per acre; farming land, for more.

FORNEY CREEK BASIN (SWAIN COUNTY, N.C.)

Area.- Total, 35 square miles; cleared, 2 square miles; wooded, 33 square miles; severely burned, 3 square miles.

Surface.- The lower part of the basin is very rough, and the slopes are steep and often precipitous. I the upper part it broadens out and divides into several small tributary valleys, which have gentle slopes.

Soils.- The soils are generally loose and thin, derived from sand stone, quartzite, and conglomerate, and are often extremely rocky.

Humus and litter.- Leaf mold is generally deep, except on dry southern slopes, or where it has been destroyed by fires.

Agricultural value.- On account of the steepness of the slopes the greater portion of the valley is not suited for agriculture. Nearly all of the level land or that with gentle slope is under cultivation. All of the common crops of the region thrive.

Timber trees.- Oaks and chestnut are the characteristic trees on the warmer soils, and with these, on colder and damper soils, are associated birch, maple, linn, buckeye, and hemlock, while at high elevations on the crest of the Smoky Mountains there is a small amount of spruce.

Yield.- The forest will cut more than 4,000 feet B. M. per acre.

Demand.- Good hard-wood timber, suitable for the manufacture of export lumber, is being bought. There is no local demand.

Accessibility.- There is a road several miles up the creek which could easily be extended to the foot of the Smoky Mountains, and the portion already built is capable of easy improvement. The Asheville and Murphy Branch of the Southern Railway crosses the mouth of the stream.

Cutting.- A great part of the best timber has been cut from the lower end of the valley, but the upper end is largely unculled.

Second growth.- There is no second-growth woods, except small areas connected with the farms.

Accessibility.- There is no good road down the lower part of the valley. The main road turns across the southern end of Forney's Ridge to Leadmill, a little farmsend town, 8 miles above the mouth of the creek; this is the nearest station on the Clarksville and Murphy branch of the Southern Railway. Rough roads extend up both branches of the stream nearly to the heads.

Cutting.- One small mill is in operation, cutting oak, yellow poplar, and pine. Some cutting has been done to within 5 miles of the head of the stream.

Second growth.- Oak, hickory, maple, and chestnut form the second growth, which is scant.

Young growth.- Thickets of laurel, rhododendron, and other shrubs often occur on the alluvations.

Reproduction.- Under existing conditions oak and chestnut reproduce freely from seed, other species less. Most of the hard wood, if well, regenerate by stool sprouts when killed by fire.

Rate of growth.- Accretion is normal for the aspect and altitude.

Water power.- This stream is too small to afford more than a limited power at any one place.

Population.- There are 17 families living on the stream.

Price of land.- Forest land sells at $2 to $5 per acre; farming land, for more.

FORNEY CREEK BASIN (BLAIN COUNTY, T.C.)

Area.- Total, 55 square miles; cleared, 2 square miles; wooded, 53 square miles; severely burned, 8 square miles.

Surface.- The lower part of the basin is very rough, and the slopes are steep and often precipitous. In the upper part it broadens out and divides into several small tributary valleys, which have gentle slopes and ridges.

Soils.- The soils are generally loose and thick, derived from sandstone, quartzite, and conglomerate, and are often extremely rocky.

Stone and litter.- Leaf mold is generally deep, except on dry southern slopes, or where it has been destroyed by fires.

Agricultural value.- On account of the steepness of the slopes the greater portion of the valley is not suited for agriculture. Nearly all of the level land or that with gentle slope is under cultivation. All of the common crops of the region thrive.

Timber trees.- Oaks and chestnut are the characteristic trees on the better soils, and with them, on colder and darker soils, are associated birch, maple, linn, hickory, and hemlock, while at high elevations on the crest of the ridge some white pine is a small amount of spruce.

Yield.- The forest will cut more than 4,000 feet B. M. per acre.

Demand.- Good hardwood timber, suitable for the manufacture of export lumber, is being bought. There is no local demand.

Accessibility.- There is a road several miles up the creek which could be extended to the foot of the steep mountains, and the portion already built is capable of easy improvement. The Asheville and Murphy branch of the Southern Railway crosses the mouth of the stream.

Cutting.- A great part of the best timber has been cut from the lower and of the valley, but the upper end is largely untouched.

Second growth.- There is no second-growth stands, except small areas covered with the laurel.

Undergrowth.- Rhododendron forms a heavy undergrowth on many moist slopes at the head of the stream, and Kalmia on some of the drier. There are large areas, however, where there is no undergrowth except occasional clumps of young trees.

Reproduction.- All the species seem to seed regularly and reproduce freely under suitable conditions, and clumps of young trees are frequent where they have not been suppressed by fires.

Rate of growth.- Rapid accretion is made where the soil is moist and deep. It is slower on dry soils and at high elevations.

Water power.- Although there is ample fall, the stream is able to yield only slight power. None is at present developed.

Prices of land.- Farming land sells at $5 to $20 per acre; woodland, at $2 to $5.

HOLAND CREEK BASIN (SWAIN COUNTY, N.C.).

Area.- Total, 24 square miles; cleared, 1 square mile; wooded, 23 square miles; burned, 2 square miles.

Surface.- The basin occupies a narrow gorge-like valley lying between the steep slopes of two southern spurs of the Smoky Mountains. There are no alluvial lands, but near the head of the stream there are a few gently-sloping benches.

Soils.- The characteristic soils are thin and light, derived in large part from gneiss, sandstone, and quartzite, and are often very rocky.

Humus and litter.- In deep hollows there is an abundant accumulation of leaf mold, but there is much less on dry south slopes.

Agricultural value.- On account of the steepness of the slopes the larger portion of the area is unsuited for tillage, though there are limited areas adapted to grass or where corn can be raised without permanent injury to the land.

Timber trees.- Oaks and chestnut are the characteristic trees on the warmer soils, and with these, on colder and damper soils, are associated birch, maple, linn, buckeye, and hemlock, while at high elevations on the crest of the Smoky Mountains there is a small amount of spruce.

Yield.- The yield is more than 3,000 feet B. M. per acre.

Demand.- Good hard-wood timber, which is suitable for export lumber, is being bought. There is no local demand.

Accessibility.- There is a road several miles up the stream which could easily be improved and extended to the foot of the Smoky Mountains. The Asheville and Murphy Branch of the Southern Railway crosses the mouth of the stream.

Cutting.- The choicest timber has been removed from the lower part of the valley, but several miles beyond a mill is at present cutting.

Second growth.- There is no second growth suitable for milling.

Undergrowth.- The forest in the lower part of the basin is nearly devoid of underwood, but in the upper part there is much rhododendron, Kalmia, and other shrubs.

Reproduction.- Clumps of young trees are frequent where there are windfalls and open places. The great number of small seedlings in the shade show the abundance of seed and attest the facility with which regeneration could be accomplished.

Rate of growth.- Rapid accretion is made, except at high elevations.

Water power.- The stream is too small to yield more than a small amount of power.

Undergrowth.- Considerable forest is heavy undergrowth on steep portions of the land of the eastern, and falls on some of the drier. There are large areas, however, where there is no undergrowth except occasional clumps of young trees.

Improvements.- All the species seem to seed regularly and reproduce freely under suitable conditions, and seedlings of young trees are frequent where they have been suppressed by fires.

Rate of growth.- Rapid succession is made where the soil is moist and deep.

Water power.- Although there is ample fall, the stream is able to yield only slight power. None is at present developed.

Prices of land.- Grazing land sells at $5 to $20 per acre; agricultural, at $2 to $6.

ROLLING GRASS BASIN (MONTE COUNTY, N.C.).

Area.- Total, 36 square miles; observed, 1 square mile; mapped, 36 square miles.

Surface.- The basin consists a narrow gorge-like valley lying between the steep slopes of two contiguous spurs of the Smoky Mountains. There are no alluvial lands, but near the head of the stream there are a few gently-sloping benches.

Soils.- The characteristic soils are thin and light, derived in large part from granite, monzonite, and quartzite, and are often very rocky.

Forms and litter.- In deep hollows there is an abundant accumulation of leaf mold, but there is much less on dry south slopes.

Agricultural value.- Cultivation of the stream of the slopes the larger portion of the area is reserved for tillage, though there are limited areas adapted to grass or alone corn can be raised without permanent injury to the land.

Timber trees.- Oak and chestnut are the characteristic trees on the warmer soils, and white pine, on colder and deeper soils, are associated with hemlock, tulip, buckeye, and basilock. Spruce and balsam are on the crest of the Smoky Mountains. Cucumber trees is a small amount of spruce.

Yield.- The yield is more than 2,000 feet B.M. per acre.

Demand.- Good hard-wood timber, which is suitable for export lumber, is being bought. There is no local demand.

Accessibility.- There is a road varying miles up the stream which could easily be improved and added to the foot of the Smoky Mountains. The labor and hardy people of the Southern Railway crossing the mouth of the stream.

Outlook.- The chief at timber has been removed from the lower part of the valley, but several miles higher and a mill is at present cutting.

Second growth.- There is no second growth suitable for milling.

Undergrowth.- The forest in the lower part of the basin is nearly devoid undergrowth. But in the upper part there is much rhododendron, laurel, and other shrubs.

Reproduction.- Clumps of young trees are frequent where there are sufficient and open places. The great number of small seedlings in the shade show the abundance of seed and without the facility with which regeneration would be accomplished.

Rate of growth.- Rapid succession is made, except at high elevations.

Water power.- The stream is too small to yield more than a small amount of power.

Occupancy.- There are only a few families living on the creek.

Prices of land.- Agricultural land sells at $4 to $30 per acre; woodland, at $2 to $5.

DEEP CREEK BASIN (SWAIN COUNTY, N. C.).

Area.- Total, 48 square miles; cleared, 6 square miles; wooded, 42 square miles.

Surface.- The basin lies between two spurs of the Smoky Mountains. Its upper portion is rough and mountainous. The mountain slopes are steep and rise abruptly, often precipitously, from the banks of the streams. The lower portion of the valley broadens out into low, rounded hills.

Soils.- In the mountains the soils are thin and light, and generally very rocky. The hills near the river have red, loamy or stiff soils. The alluvial lands are limited in extent, and have silty or sandy loam soils.

Humus and litter.- The leaf mold has accumulated to a great depth in the deep mountain hollows, but is very thin on the poor and dry southern slopes.

Agricultural value.- The sandy soils on the mountain slopes are generally not so productive after they have been in cultivation several years as are the red lands, though they often yield better at first.

Timber trees.- Mountain hard woods, intermixed with a small proportion of hemlock and spruce, form the forests, except in the lower part of the basin. where they are formed of small oaks, chestnut, and hickory, with some black pine.

Yield.- The forests in the upper part of the basin will cut more than 3,000 feet B. M. per acre; those in the lower part, not so much.

Demand.- There is an active demand for good hard-wood stumpage for export lumber. The local requirements are inconsiderable.

Accessibility.- The Southern Railway crosses the lower part of the valley, and a wagon road extends from it nearly to the head of the basin.

Cutting.- The choicest trees have been removed from the lower end of the valley which is contiguous to the railroad, but only desultory cutting has been carried on more than 10 miles from the railroad.

Second growth.- There is only a very small amount of second growth in the valley, and that is in the southern part.

Undergrowth.- A heavy undergrowth of laurel mantels the moister slopes at the head of the stream, while many of the drier slopes support Kalmia and other shrubs.

Reproduction.- Clumps of young oaks and chestnut are not infrequent where windfalls have admitted light or where lumbering has been in progress. Young growth of other species is frequent wherever there are suitable conditions for its growth.

Rate of growth.- Accretion is good in the moist hollows, but slower on dry south slopes and at high elevations.

Water power.- This stream is too small to afford more than a limited power at any place, even under the best development.

Occupancy.- About 30 families live on this stream, the greater number of them below the forks of the creek.

Prices of land.- Farming land sells at $6 to $50 per acre, woodland, at $2 to $10 per acre.