
PART II.

AGRICULTURAL DESCRIPTIONS
OF THE
COUNTIES OF GEORGIA.

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AGRICULTURAL DESCRIPTIONS

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The county descriptions comprised in this portion of the report were made up in part from data obtained from the state geological records, in part from reports of correspondents, and in part from published reports of the state department of agriculture. Errors have doubtless crept into the descriptions because of imperfect data, but in the main they are correct.

The county headings, with the exception of regional areas, are from the census returns of 1880. The term *woodland* has reference to the original condition of the country without respect to tilled lands. The estimate of the product per acre in seed-cotton and in lint has been made upon the basis of 475 pounds of lint per bale, reported by a number of cotton merchants in Atlanta and Savannah to be the average bale of the season of 1879-'80; also upon the generally accepted ratio of 1 pound of lint to 3 pounds of seed-cotton.

To each county description is appended an abstract showing the character of its lands as reported by correspondents, except for a few counties, from which no answers to schedule questions were received. It will be noted that there is sometimes a discrepancy between the statements of the cotton product per acre and that reported as the actual product as given in the census returns. This may be explained in several ways. Correspondents report that which would be an average yield in *good* seasons and under *fair culture*. It naturally happens that a large number of planters in each cotton county fail to give *fair culture* to the crop, and the result is a diminished average product per acre. Again, the season of 1879-'80, the census cotton year, was one of dryness, and the crop was considered short, making the product per acre smaller than it would otherwise have been.

The counties are arranged with regard to agricultural regions, the names of all comprised in each region, either wholly or in part, being placed at the first and in the order in which they appear. Those whose descriptions are given in other regions are marked by an asterisk (*), and reference is made to the region. The abridgment of many of the county descriptions is made necessary for the following reasons: 1. Because of a comparatively small county area, which precludes much variety in its lands; 2. Because of the great similarity of counties embraced within large regions, such as the metamorphic and pine and wire-grass regions, where lands of the same character reach over a large territory; 3. Because of so large a number of counties in the state, a full and detailed description of each of which would require a far greater space than can be spared in this report, besides making intolerable the vast amount of repetition in such descriptions. The reader is therefore generally referred to Part I or to the abstract which may accompany the county for detailed descriptions of soils and other features of each region that are represented in a county.

NORTHWEST GEORGIA. (a)

(Embraces the following counties and parts of counties, Murray: Whitfield, Catoosa, Walker, Dade, Chattooga, Gordon, Floyd, Polk, Bartow, and a small part of Paulding.*)

MURRAY.

Population: 8,269.—White, 7,362; colored, 907.

Area: 420 square miles.—Woodland, all.

Tilled lands: 42,494 acres.—Area planted in cotton, 5,937 acres; in corn, 14,338 acres; in wheat, 8,178 acres; in oats, 2,168 acres; in rye, 128 acres.

Cotton production: 1,917 bales; average cotton product per acre, 0.32 bale, 459 pounds seed-cotton, or 153 pounds cotton lint.

a The description of the counties of Northwest Georgia are by A. R. McCutchen, special agent.

About 20 per cent. of the surface of Murray county is a mountainous region belonging to the Cohutta range, and is confined to the eastern side of the county in a width of from 3 to 7 miles.

The coves and valleys of the mountainous area afford uniformly productive lands, and the soils here vary much in relation to the proportions of sand, lime, and clay, but may generally be described as sandy loams. A common feature of the valleys on the eastern side of the county is the great abundance of cobble-stones. These are so large and so numerous in some localities as to be a great obstacle in the cultivation of the lands. At a distance of 2 or 3 miles west of the mountains there are good bodies of rolling uplands with red calcareous soils. (See general description.) These lands are bordered on the west, in the central and northern parts of the county, by ridges with gray gravelly soils, and on the southwest by a nearly level area of several miles in extent, which has a poor gravelly and sandy soil and is known as the "flatwoods". (See page 24.) The lands between the above-mentioned ridges and the Connasauga river have a brown clay soil, underlaid by argillaceous shales.

Good bodies of alluvial lands occur on all the streams west of the mountains, the most important in extent being that of the Connasauga and the Coosawattee bottoms.

ABSTRACT FROM THE REPORT OF WILLIAM J. JOHNSON, OF SPRING PLACE.

The lands cultivated in cotton include the black sandy loams, somewhat elevated, the gray sandy, and the red or mulatto soils. The chief soil is commonly designated *hickory land*, and consists of a coarse sandy and gravelly loam varying in color from gray to blackish and black, and is 6 inches deep. The subsoil is a clay loam of a reddish-yellow color, which contains all kinds of gravel, and is generally underlaid by soft, slaty rock at about 2 feet. Tillage of this land is difficult in wet and easy in dry seasons. The average size of the farms is 200 acres, and one-fifth of the cultivated area is planted in cotton. The usual and most productive height of the plant is from 3 to 4 feet, which in wet, warm weather inclines to run to weed, and can only be remedied by topping. Fresh land produces from 800 to 1,000 pounds of seed-cotton per acre. No cotton is planted here without fertilizers of some kind, and the crop is improved by their use. On old land the staple rates one-eighth of a cent higher per pound than on fresh land. Crab-grass and rag-weeds are most troublesome. Five per cent. of this land originally cultivated now lies "turned out", but it improves considerably in ten years. The slopes are not much damaged by washing and gulying, while the valleys are improved to the extent of 20 per cent. or more. Successful efforts have been made to check the damage by horizontalizing, hillside ditching, and by throwing brush and other rubbish into the gullies.

The *gray soil* covers one-half of the region, and is coextensive with the hickory land just described. It is a fine sandy and gravelly loam, varying in color from whitish-gray to blackish, and is 4 inches deep. The character of the subsoil and the tilling qualities of the surface soil are like those of the hickory land. The soil is early and warm if well drained, but late and cold if ill drained. One-half of its cultivated area is planted in cotton. The usual and most productive height of the plant is 2 feet, and it never runs to weed. The seed-cotton product per acre on fresh land is 500 pounds. One-fifteenth of this gray soil lies "turned out", which improves by resting, especially if it grows up in pine bushes.

The third quality of soil is called *red or mulatto soil*, black-jack or slaty land, which includes one-fifth of the region, and is known to extend for 20 miles in each direction. The soil is a sandy and gravelly loam of a whitish-gray color, 3 inches thick. The subsoil is a light yellow clay, containing a variety of pebbles, underlaid by slate-rock at one foot. Tillage is difficult in wet and easy in dry seasons, and the soil is early and warm, but ill drained. The chief crops are wheat and cotton, the latter occupying about one-fifth of the tilled lands. The usual and most productive height of the plant is from 2 to 2½ feet. The seed-cotton product per acre on fresh land is 400 pounds. There are no troublesome weeds on this soil if it be tolerably cultivated. About one-fifth of such land once cultivated now lies "turned out", and does not improve much while in that condition. The slopes wash and gully a little, and are seriously damaged, while the valleys are improved by the washings. No efforts have been made to check the gulying.

The balance, or about one-tenth of the land of this region, consists of the *bottoms* of rivers, creeks, and smaller streams. It is of superior quality, and produces all the cereals, grasses, and clover to perfection, but is not suitable for cotton, because the latter grows too much to weed and does not open many of its bolls.

Cotton is ginned as fast as picked, and is sent to Dalton by wagon.

WHITFIELD.

Population: 11,900.—White, 9,689; colored, 2,211.

Area: 330 square miles.—Woodland, all.

Tilled lands: 44,199 acres.—Area planted in cotton, 4,063 acres; in corn, 19,992 acres; in wheat, 8,163 acres; in oats, 5,443 acres; in rye, 193 acres.

Cotton production: 1,240 bales; average cotton product per acre, 0.30 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

The mountains altogether cover an extent within Whitfield county of about 40 square miles, the northern part of the county being divided by bands of low ridges, with generally narrow intervening valleys. A large proportion of the surface of the county consists of comparatively level areas, and this is especially true of the eastern and southeastern portions.

Of the cultivated lands of the county a considerable proportion is river and creek alluvial land. The most important of these are those of the Connasauga river and Coochulla, Mill, East Chickamauga, and Swamp creeks. The soil of the Connasauga bottoms is more sandy than that of most of the smaller streams.

The finest quality of uplands is found in Red Clay valley, in the northern part of the county. This valley extends from Tennessee, a distance of 9 miles, in this county, with an average width of about 1 mile. The lands are generally rolling, and have a durable soil that is easily cultivated and almost equally well adapted to all crops. This soil is calcareous and is of a dark red color, with a subsoil of a somewhat lighter shade than the virgin soil, but differing in appearance but little after a few years' cultivation. These lands are found also at Dalton; also on the western base of Chattoogata and Rocky Face mountains and on the eastern side of Crow valley. The lands of this character cover an extent of nearly 20 square miles.

The uplands of greatest extent are the clay lands, amounting to 125 square miles. These belong to Dogwood valley, on the west of Chattoogata mountain, to some narrow valleys in the northern part of the county, and to comparatively broad areas in the eastern and southern portions. Some of these on the southeast are nearly level,

and are rather unproductive from imperfect natural drainage. The county contains ridge lands, with a gray gravelly soil amounting to about 100 square miles. These lands, except along the borders of the valleys, are but little cultivated. There are two low and narrow ridges, one crossing the western part of the county and the other extending a few miles into the southern part, with unproductive sandy land. Cotton crops average 12.3 acres per square mile. Dalton is the principal produce market.

CATOOSA.

Population: 4,739.—White, 4,127; colored, 612.

Area: 160 square miles.—Woodland, all.

Tilled lands: 24,600 acres.—Area planted in cotton, 367 acres; in corn, 10,783 acres; in wheat, 5,911 acres; in oats, 1,503 acres; in rye, 62 acres.

Cotton production: 111 bales; average cotton product per acre, 0.30 bale, 432 pounds seed-cotton, or 144 pounds cotton lint.

A sandstone ridge of 500 or 600 feet in height, known as Taylor's ridge south of Chickamauga gap and as White Oak mountain north of this gap to its terminus in Tennessee, extends nearly north and south through Catoosa county. Another ridge of like character, but of a somewhat less altitude, known as Dick's ridge, runs nearly parallel with this on the east at a distance of about 1 mile. The country to the east and west of Taylor's and Dick's ridges is divided up by belts of low ridges, with intervening valleys, comparatively broad on the western and narrow on the eastern side of the county. The drainage is toward the north, except in the northeastern portion of the county, where the tributaries of East Chickamauga creek run in a southwesterly direction.

The valley of West Chickamauga, and also that immediately west of Taylor's ridge and White Oak mountain, contain productive brown and red calcareous lands. The two valleys cover an area of about 36 square miles, and include within their limits about half of the cultivated lands of the county. Nearly one-fourth of this extent is covered by the rich alluvial lands of West, Middle, and East Chickamauga creeks. Though the streams often overflow the bottom lands during the heavy winter and early spring rains, they are not generally rapid, and such lands are seldom injured by washing. The lands of Peavine valley and the shale valleys east of Dick's ridge, with an area altogether of about 24 square miles, are second in importance. The soil contains less lime, and the uplands are somewhat less productive, though the bottom lands are often of equally good quality, that of Peavine creek having a good extent for the size of the stream, being from one-fourth to half a mile in width and about 9 miles in length within the county. There is an extent of about 45 square miles, with a gray siliceous gravelly soil, belonging to four lines of ridges that cross the county parallel with Taylor's ridge and White Oak mountain.

Ringgold, on the Western and Atlantic railroad, and Chattanooga, Tennessee, are the principal markets for produce.

ABSTRACT FROM THE REPORT OF W. J. WHITSITT, OF RINGGOLD.

The lowlands consist of the second bottom of Chickamauga creek; the uplands of strips of rolling lands, separated by intervening level valleys, with clay subsoils.

The chief soil cultivated in cotton is commonly designated *rolling gravelly land*, and includes two-thirds of the area of this region, extending 20 miles north, 50 south, 15 east, and from 12 to 15 miles west. This soil is a coarse sandy and gravelly loam of a whitish-gray color, varying sometimes to mahogany and orange, and is 4 inches deep. The subsoil is heavier than the surface soil, and in some places is red, pulverizing easily, and in others pale in color and inclined to be tough, and contains flinty white gravel. Tillage of the soil is easy, especially in dry seasons; but in wet weather it is inclined to form in clods. It is moderately early and warm, and tolerably well drained. Corn, oats, wheat, and grasses were the only crops until 1878, since which year cotton production has been rapidly on the increase. The rolling lands are best adapted to cotton, and the valleys and bottoms to corn and grasses. One-third of the cultivated area is planted in cotton. The usual and most productive height attained by the plant is 2½ feet. It inclines to run to weed on very rich soils, such as those of the bottoms, which is restrained and bolting favored by using fertilizers and planting closer in the drill.

The seed-cotton product is 1,000 pounds per acre, rating in market as strictly good middling, the best in the south. After five years' cultivation the seed-cotton product per acre is 400 pounds, but its original production is maintained even at twenty years by the use of fertilizers. The ratio of seed to lint is the same as in the case of fresh land, and the staple is as long but not so fine, and rates two grades below that from fresh land. The most troublesome weeds are crab-grass and crowfoot. Lands which were formerly "turned out" as unprofitable for the culture of corn and wheat are now being taken in and planted in cotton.

The soil on slopes washes and gullies readily, but the damage done to the slopes is not irreparable, and the valleys are slightly benefited by the washings. To check the damage hillside ditching has been recently practiced successfully.

Cotton is shipped as soon as ginned, by railroad, to Rome.

WALKER.

Population: 11,056.—White, 9,492; colored, 1,564.

Area: 440 square miles.—Woodland, all.

Tilled lands: 69,756 acres.—Area planted in cotton, 5,797 acres; in corn, 26,033 acres; in wheat 15,115 acres; in oats, 5,915 acres; in rye, 166 acres.

Cotton production: 2,009 bales; average cotton product per acre, 0.35 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

The surface of Walker county presents a great diversity of features, having table-land mountains on the west side and sharp-topped mountains on the east, with the intermediate country subdivided into valleys, knobby belts of ridge lands of varying widths and narrow sandstone ridges running parallel with the mountains in their general direction or encircling the ends of terminating spurs.

The general altitude of the county is above that of the surrounding country. Its water-courses have their sources within its limits, and run into each of the adjoining counties and into the states of Alabama and Tennessee. The valleys range from 800 to 1,200 feet and the mountains from 1,500 to 2,300 feet above the level of the sea.

The general directions of the drainage from a water-divide that crosses the county in a northeast and southwest direction are northward into the Tennessee river and southward to the Coosa river.

About one-eighth of the county is mountainous, (a) and, including with this the steeper portion of "the ridges", about one-fifth of its surface is probably too steep for cultivation. The mountain sides are generally rich, and are covered with a heavy growth of timber. The lands of the county outside of the table-lands are all more or less calcareous. The larger portion of the lands of McLemore's cove, continuing toward the north side of the county in West Chickamauga valley and for several miles in Chattanooga valley, embrace rich calcareous soils. The same lands are also found in Duck and Dry Creek valleys continued north of the water-divide in Crawfish valley, and is found again in Dry valley and at the western base of Taylor's ridge. Lands similar to these in character of productiveness, but with a dark red soil, are found in the valleys west of John's, Horn's, and Chattoogata mountains. The area of these valleys altogether amounts to about 95 square miles, about 40 per cent. of which is cleared and under cultivation. These valleys have fine clover lands, and have been devoted mostly to corn, wheat, and oats. Lands having a brown loamy soil, containing much less clay and more sand than those of the above-named valleys, are found in West Armuchee valley, in the shinbone valleys, and for a few miles in the northern part of Chattanooga valley. These lands have an extent of 57 square miles, with 75 per cent. under cultivation, and are well adapted to corn, wheat, and oats, and are nearly the only lands on which cotton has been grown with success without fertilizers. West Armuchee valley is nearly the only locality in the county in which this crop was grown to much extent before the recent general use of commercial fertilizers. Peavine and Chattooga valleys and a part of East Armuchee valley afford a brown clay soil, covering an area of 35 square miles, with 40 per cent. under cultivation. (See analyses of soils, pages 25 and 27.)

The table-land, with a sandy soil, has an extent of 70 square miles, and "the ridges", with a gray gravelly soil, occupy 120 square miles. About 5 per cent. of these consist of cleared lands, and perhaps about one-fourth of the entire area of each is either too steep or else too rocky for cultivation. The soils of the alluvial lands are generally argillaceous, though those on West Armuchee creek and portions of Chattanooga and Duck creeks are somewhat sandy. The county has a great number of streams, most of which are small; but the creek bottoms constitute in the aggregate a considerable proportion of the cultivated lands.

ABSTRACT FROM THE REPORT OF J. A. CLEMENTS, OF VILLANOW.

Cotton is late in maturing on lowlands unless they are dry and sandy; hence the chief soil cultivated in cotton is the *sandy or gravelly* and more or less *calcareous upland*. This upland is rather level, covers about 40 per cent. of this region, and consists of narrow valleys, coves, and basins, bordered by ridges or mountains. Its natural growth is red oak, hickory, walnut, Spanish oak, chestnut, etc. The soil is a brown and blackish coarse sandy and gravelly loam 5 inches thick. The subsoil is more clayey than the surface soil, is generally deep red, sometimes yellow, and does not require artificial drainage. It contains flinty concretions, soft "black gravel", and rounded and angular pebbles, and is underlain by limestone with flinty concretions from 2 to 35 feet. This soil is generally easily tilled, is early, warm, and well drained, and is apparently best adapted to corn. The chief crops are corn, wheat, oats, and cotton, one-fourth of the cultivated area being planted with the latter. The plant attains a height of from 2 to 2½ feet, and is most productive at 2 feet. On dark, rich soil, and in wet seasons in June and July, the plant inclines to run to weed, which is restrained and bolling favored by planting closely and using fertilizers.

The seed-cotton product per acre when the land is fresh is 800 pounds, and 1,545 pounds make a 475-pound bale of lint which rates in the market as low middling. After 15 years' cultivation the product is 500 pounds per acre, 1,630 pounds making a 475-pound bale; but the staple is not quite so good as that from fresh land. Crab-grass is the most troublesome on this soil. About 3 per cent. of such land originally cultivated now lies "turned out", but by the help of fertilizers it produces well when again cultivated. Slopes are seriously damaged by washing and gullying, and the valleys are also slightly injured by the washings. Horizontalizing and hillside ditching are practiced to check the damage, and with good success when properly done.

ABSTRACTS FROM REPORTS OF J. A. CLEMENTS AND W. F. TAPP, OF VALLEY STORE (CHATTOOGA COUNTY), AND F. M. YOUNG, OF GREENBUSH (ARMUCHEE VALLEY).

Clay and slaty red and yellow lands.—This soil covers from 35 to 50 per cent. of this region, and extends over the ten counties of northwest Georgia. The soil varies from a clay loam to clay, and in color from gray to yellow, brown, and blackish, and is 6 inches deep. The subsoil is usually yellow, but sometimes red, heavier than the surface soil, is impervious when undisturbed, and improves by cultivation and exposure at the surface. It is underlain at from 1 foot to 20 feet by soft, red, slaty rock or shales, and in places by limestone. The soil is easy to till in dry, but difficult in wet seasons, is early, warm, and well drained, and is apparently best adapted to wheat, corn, cotton, and oats. One-third of it is planted in cotton. The usual and most productive height of the plant is from 2½ to 3 feet. Too much rain in July and August inclines it to run too much to weed, but this may be restrained and bolling favored by shallow cultivation, close planting, topping, and the use of highly ammoniated fertilizers. The product of seed-cotton per acre of fresh land is from 750 to 1,000 pounds, 1,525 pounds making a 475-pound bale of lint, which rates in the market as middling. After twenty years' cultivation the product of seed-cotton per acre is 400 pounds, 1,515 pounds then making a 475-pound bale of lint, which rates lower than that from fresh land. Crab-grass is the most troublesome weed. About one-tenth of this land originally cultivated now lies "turned out", and when again cultivated does not produce as well as when first cleared. Slopes in some places are damaged by the washing and gullying of the soil, but the washings damage the valleys very slightly in some places and improve them considerably in others. To check the damage hillside ditching, horizontalizing, and deep plowing are practiced, with good success; hillside ditching is least effectual.

Bottom lands.—The creek bottoms form about one-fifteenth of the land of this region. They bear a natural growth of white oak, hickory, walnut, poplar, maple, and chestnut. The soil is a dark-colored, fine sandy and gravelly loam, 7 inches thick. The soil is apparently best adapted to cotton and corn, but one-half of it is planted in cotton. The plant attains the height of from 3 to 4 feet, and is most productive at 3 feet. It inclines to run to weed in wet seasons, which may be restrained by heavy fertilizing, close planting, and shallow cultivation. The seed-cotton product per acre of fresh land is from 1,000 to 1,600 pounds, 1,485 pounds making a 475-pound bale of lint, which rates in the market as middling. After from fifteen to forty years' cultivation the product per acre is 1,000 pounds, the ratio of seed to lint and the quality of the staple being about the same as in the case of fresh land. The most troublesome weed is crab-grass. None of this land lies "turned out".

a In the table-lands of Lookout and Pigeon mountains the escarpments only are included in this estimate.

DADE.

Population: 4,702.—White, 3,618; colored, 1,084.

Area: 180 square miles.—Woodland, all.

Tilled lands: 17,148 acres.—Area planted in cotton, 32 acres; in corn, 8,336 acres; in wheat, 3,996 acres; in oats, 2,999 acres.

Cotton production: 12 bales; average cotton product per acre, 0.38 bale, 534 pounds seed-cotton, or 178 pounds cotton lint.

Lookout valley, with an average width of about 3 miles, extends across Dade county in a northeasterly and southwesterly direction between the table-land of Lookout mountain on the east and that of Sand mountain on the west. The altitude varies from 600 to 800 feet above sea-level, while the table-lands on each side rise from 800 to 1,200 feet above the valley. Two nearly parallel ridges of from 100 to 200 feet in height subdivide the main valley for most of its extent into three divisions, and the portions lying between these ridges and the mountains are usually quite narrow and trough-shaped, and are known as the "back valleys". A large portion of the county lies on the Lookout and Sand mountain table-lands.

The county is drained northward into the Tennessee river by Lookout creek and its tributaries, with the exception of a small area in the northwestern corner of the county.

The valley lands are not surpassed in productiveness by any of equal extent in the state, the soils being all more or less calcareous, that of the central part of the valley being especially well suited to cereals, grasses, and clover. Some of these lands are nearly level, others are rolling, while toward the northern terminus of the valley they become quite hilly and afford a better yield of wheat. The soils of the back valleys are generally somewhat sandy. (For a description of the table-lands see page 28.)

Very little cotton has been planted in this county; but from the present rate at which the area of cotton culture is extending in the adjoining county of Walker and elsewhere in the state, where neither the land nor the climate can be better suited, it may be inferred that this crop may soon become an important production of the county, especially on the sandy lands of the back valleys and on Lookout and Sand mountains.

ABSTRACTS FROM THE REPORTS OF T. J. LUMPKIN, M. D., OF RISING FAWN, AND W. A. CHAMBERS, OF MORGANVILLE.

The cotton-plant grows large and bolls well, but it is rather cold, and the seasons are so short here that the bolls do not open well unless fertilizers are used. The chief soil cultivated in cotton is the *sandy loam*, in patches, for example, on the second bottom of Lookout creek, near Lookout mountain, which covers about one-fifth of this region, and extends about 30 miles north and much farther in other directions. It bears a natural growth of hickory, oaks, chestnut, walnut, poplar, beech, gums, and pine. The soil varies from a fine sandy to a gravelly loam, and from whitish-gray to yellow, brown, and black in color, and has a depth of from 1 foot to 4 feet. The subsoil is a heavy mulatto clay hard-pan (on the uplands it is a stiff, reddish clay), contains hard, white, rounded gravel, and is underlaid by hard limestone at from 3 to 40 feet. Tillage of this soil is difficult in wet but rather easy in dry seasons, and the soil is early and warm when well drained.

The chief crops are corn, wheat, and oats, but the soil is apparently best adapted to corn and wheat. Not more than one-fiftieth of the cultivated area of this soil is planted in cotton. The seed-cotton product per acre is from 1,000 to 1,500 pounds when the land is fresh, the lint rating as middling. Old land produces from 500 to 1,000 pounds of seed-cotton per acre, and 1,545 pounds then make a 475-pound bale of lint, which is a little shorter than that from fresh land. Crab-grass is the worst weed, cocklebur being the next. The soil on slopes washes and gullies readily, but farmers prevent serious damage by horizontalizing and hillside ditching. The valleys are damaged only to a very limited extent by the washings.

The second kind of land is designated as *black lime land*, and extends from the Tennessee river on the north to the Coosa river on the south. The soil is a black calcareous loam from 2 to 8 inches deep, underlaid by a hard, heavy mulatto subsoil, which is again underlaid by limestone at from 8 to 40 feet. Tillage of this land is easy in dry but difficult in wet seasons. The soil is late and cold, but well drained, and is apparently best adapted to corn. Very little cotton is planted on it.

Dade county is connected with Chattanooga and Rome by rail, freight being from 50 cents to \$1 per bale.

CHATTOOGA.

Population: 10,021.—White, 7,981; colored, 2,040.

Area: 400 square miles.—Woodland, all.

Tilled lands: 50,802 acres.—Area planted in cotton, 12,906 acres; in corn, 20,078 acres; in wheat, 7,930 acres; in oats, 6,044 acres; in rye, 95 acres.

Cotton production: 5,247 bales; average cotton product per acre, 0.41 bale, 579 pounds seed-cotton, or 193 pounds cotton lint.

The mountains and steep sandstone ridges of Chattooga county cover altogether about 68 square miles, and the low, nodular ridges 110 square miles. Of the 170 square miles of comparatively level areas about 30 are situated on table-lands of Lookout mountain, ranging in altitude from 1,200 to 2,000 feet above the sea, and the remaining area is in valleys ranging in altitude from 700 to 800 feet. Nearly one-fourth of the valley lands have a brown-loam soil, embracing mostly those on the east of Taylor's ridge, and particularly the lands of Dirt Town and Shinbone valleys.

Broom Town valley and Chattooga valley cross the county between Lookout mountain and Taylor's ridge and are parallel with them. These afford good clay lands, commonly distinguished here as *mulatto lands*, and are uniformly productive where there is a good depth of clay or subsoil above the underlying shales, as is the case with most of the extent of these two valleys. The area is about 45 square miles.

Of the more calcareous lands, of which there are about 30 square miles, some lying next to Taylor's ridge, on the west, have a dark red soil; and that of Dry valley, and some of the lands immediately east of Shinbone ridge, have a brown and sometimes a gray soil, with an intermixture of gravel, derived from the bordering ridges.

The result of recent trials in the cultivation of cotton with fertilizers on the sandy lands of Lookout mountain is very favorable. The lower average temperature on the table-lands in comparison with the valleys is perhaps

more than counterbalanced by its greater uniformity, there being but little difference in the daily minimum temperature, and by the general absence of chilling dews, as well as by a less severity and a longer delay of frosts in the fall.

The gray gravelly lands extend over nearly one-third of the surface of the county. The improved lands of this class, of which there is but a small proportion, are confined mainly to the borders of the ridges to which they belong.

There are fine bodies of alluvial lands along the Chattooga river and many of the smaller streams. The bottom lands east of Taylor's ridge, and those of some of the streams running from Lookout mountain, are sandy to some extent. The cotton crop is sold either at Trion Factory, in this county, or in Rome.

ABSTRACTS FROM THE REPORTS OF A. P. ALLGOOD, OF TRION FACTORY, AND C. D. HILL, OF RACCOON MILLS.

The chief soil is commonly designated *gray land*, which includes about three-fourths of the cultivated land of this region and extends throughout the county. Its chief timber is oak and hickory. It is a gravelly clay loam of a gray color 6 inches thick. The subsoil is red and white clay, somewhat leachy, which contains "black gravel" and angular white pebbles. In some places it is underlaid by clay, and in others by limestone, not far from the surface. The soil is rather easily tilled in dry seasons, is somewhat early and generally well drained, and is best adapted to cotton, corn, and oats, which, together with wheat, potatoes, and sorghum, are the chief crops of this region. About two-fifths of this soil is planted in cotton. The plant attains a height of 3 feet, at which it is most productive. Wet, hot seasons and deep culture incline it to run to weed, but this may be checked and bolting favored by surface cultivation or by topping, or by both.

The product of seed-cotton per acre of fresh land is from 800 to 1,000 pounds, 1,450 pounds being required for a 475-pound bale of lint rating as middling. After five years' cultivation the product is from 300 to 600 pounds of seed-cotton, and 1,500 pounds make a 475-pound bale of lint, which is shorter, but otherwise better than that from fresh land. The troublesome weeds are rag-weed and crab-grass. Some of this land has been lying out only because the fences were destroyed during the late civil war and have not been rebuilt till recently; such are now the best cotton lands in this region. Slopes are somewhat injured by washing and gullying, but the valleys are improved by the washings. Horizontalizing is successfully practiced to check the damage.

Additional descriptions of the mulatto and bottom lands, by C. D. Hill.

The *mulatto soil* forms a small part of the cultivated area, and occurs in patches in many parts of the county. Its growth is oak, hickory, chestnut, poplar, with occasionally walnut. The soil is a mahogany-colored loam from 8 to 12 inches thick, and is generally gravelly. The subsoil is a very red clay, free from gravel or grit, and excellent for making brick; in some places it contains "black gravel". Limestone underlies it at various depths. The soil is comparatively easy to cultivate in wet or dry seasons, is early and moderately well drained, and is apparently best adapted to corn and wheat. Cotton does very well in some seasons, but in others does not open well. One-third or more of this soil is planted in cotton. The plant attains a height of from 3 to 4½ feet, but is most productive at 3 feet. It inclines to run to weed generally, and the tendency is increased by too much rain and by deep plowing.

The seed-cotton product per acre of fresh land varies from 600 to 1,200 pounds, about 1,485 pounds making a 475-pound bale of lint, which is of good quality, but is a little rough. After five years' cultivation the product is from 400 to 800 pounds per acre, and about 1,515 pounds then make a 475-pound bale of lint, which is not so long, but is of better quality than that from fresh land.

Rag- and hog-weeds, and especially crab-grass, are most troublesome on this soil. Little or none of such land lies "turned out", as it is more durable than the gray land and has a better subsoil. The slopes are not so much damaged by washing and gullying as those of the gray land. The *bottoms*, varying in width from 100 yards to half a mile, are as long as the streams, and bear a natural growth of poplar, sweet gum, wild cherry, beech, white oak, and hickory. The soil varies from brown to black, is from 2 to 3 feet thick, and is composed of fine silt and sand. The subsoil is fine sandy, and makes a transition into leachy, crawfishy clay below, which is in some places underlaid by rock at from 10 to 20 feet below the surface. The soil is easily tilled in dry seasons, is late, cold, and frequently ill drained, and is best adapted to corn and clover. Very little cotton is planted on it, because it is subject to rust. The plant frequently grows from 5 to 7 feet high, but is more likely to bear a crop when from 3 to 4 feet high, yielding from 600 to 1,200 pounds of seed-cotton per acre. After five years' cultivation the product is not diminished; the ratio of seed to lint is the same, the staple is perhaps smoother, and the plant is less inclined to run to weed. The most troublesome weeds are cocklebur, Spanish needle, and crab-grass. None of this land lies turned out.

Shipments are made to Rome, by wagon, commencing on the 15th of October, freight being \$2 per bale.

GORDON.

Population: 11,171.—White, 9,347; colored, 1,824.

Area: 360 square miles.—Woodland, all.

Tilled lands: 69,467 acres.—Area planted in cotton, 8,668 acres; in corn, 22,661 acres; in wheat, 14,239 acres; in oats, 6,069 acres; in rye, 169 acres.

Cotton production: 3,301 bales; average cotton product per acre, 0.38 bale, 543 pounds seed-cotton, or 181 pounds cotton lint.

There are two ranges of mountains in Gordon county running nearly parallel, Horn's and Salacoa, respectively on the west and east side of the county. The intermediate portion of nearly 20 miles' width is subdivided into narrow valleys by bands of knobby ridges.

A large proportion of the cultivated area is of the alluvial lands of the Oostenaula river and its tributaries. The large streams of the county are remarkably crooked, and their broad bottom lands can hardly be excelled in productiveness. Between Horn's mountain and the Oostenaula river there is a fine body of rolling uplands with brown loam soils (see general description). The lands of this character have an extent of 25 square miles. Most of the valley uplands east of the Oostenaula river, covering 90 square miles, are brown or red clay lands underlaid by shales, and are of the character often designated as "mulatto lands". The gray gravelly lands have an area of nearly 70 square miles, in two sets of ridges running through the central portion of the county. The eastern belt of ridges has a width of 3 or 4 miles, and contains some sandy land. On the western side of the county there is a section of several miles in width, extending nearly through the county, covered with steep, slaty hills. These lands are generally poor and but little cultivated. The Oostenaula and the Coosawattee rivers are navigable for small boats for a part of the year.

ABSTRACT FROM THE REPORT OF AARON ROFF, OF CALHOUN.

The river lands are sandy and earlier than the valleys of the uplands, and are therefore better for cotton. The lands cultivated in cotton are the gray sandy, the chocolate-colored calcareous, and the red soils. The *gray sandy soil*, covering one-fourth of the area of this region, is known to extend 20 miles in each direction, and bears a natural growth of hickory, walnut, poplar, pine, and oak. The soil is a fine sandy and gravelly loam, chiefly of a gray color, and is 6 inches deep. The subsoil is a red clay, and is underlaid by rock. The soil is late and cold, and is difficult to cultivate in wet seasons. The average size of farms is 300 acres, and the chief crops are corn, wheat, oats, and cotton; but the soil is apparently best adapted to cotton. The usual and most productive height of the cotton-plant is 3 feet. Rainy weather or excessive manuring inclines the plant to run to weed, which may be restrained and bolting favored by topping.

The seed-cotton product per acre of fresh lands is 800 pounds, the lint rating as first class. After five years' cultivation the product is 600 pounds per acre, with first-class lint. Hog-weeds and rag-weeds are most troublesome. No land of this kind now lies "turned out"; and that which was out is again cultivated, and produces as well as originally, and in some instances better than at first. Slopes wash and gully very little, and are not seriously damaged in this way, while the valleys are benefited by the washings. No efforts have been made to check the damage.

Shipments are made as fast as the cotton is ginned, by the Western and Atlantic railroad, to Atlanta, Rome, and Dalton, rate of freight being 12½ cents per 100 pounds.

FLOYD.

Population: 24,418.—White, 14,958; colored, 9,460.

Area: 540 square miles.—Woodland, all.

Tilled lands: 96,479 acres.—Area planted in cotton, 30,615 acres; in corn, 29,872 acres; in wheat, 9,251 acres; in oats, 8,413 acres; in rye, 52 acres.

Cotton production: 14,545 bales; average cotton product per acre, 0.48 bale, 678 pounds seed-cotton, or 226 pounds cotton lint.

The surface of Floyd county varies from nearly level to hilly and mountainous, the principal mountains being in the northwestern part of the county. The valleys in this portion of the county have a nearly level or rolling surface, and are not generally subdivided by ridges, as is common in most of the country to the north and west. The eastern side of the county is covered principally with cherty ridges, with two or three narrow valleys extending nearly north and south. The southern and southwestern portions are similarly divided, but have broader valleys and comparatively narrow ridges.

The large streams have but little fall, and take a winding course, with broad bottoms on one or both sides. The soil of the river bottoms, and that of some of the creeks, particularly in the northwestern part of the county, is sandy in such proportion as to promote easy culture. These sandy bottoms are among the most productive for all crops, with a special adaptation to the growth of cotton, yielding from 600 to 800 pounds of seed-cotton per acre without fertilizers. There are several valleys with rich calcareous lands in the southern and eastern parts of the county. Van's valley affords the largest body of these lands. (For description, see Cedar valley, Polk county.) The valleys in the northwestern part of the county have generally a brown loam soil, with here and there, next the mountains, a gray gravelly or rocky soil. The gravelly ridge lands cover a large proportion of the eastern and southern parts of the county. The "flatwoods" extend through the county near the Oostanaula and Coosa rivers. These lands are generally level, are about 50 feet above the high water mark of these rivers, and are covered with a growth of short-leaf pine and scrubby red and post oaks. Cotton is grown here with success on the better lands without fertilizers, and is one of the chief crops on all cultivated land.

Rome is the chief market. The Coosa and Oostanaula rivers are navigable for small boats.

ABSTRACT FROM THE REPORT OF GEORGE S. BLACK, OF ROME.

The seasons are rather short for cotton. It is considered unsafe to plant before April 15, and killing frosts appear early in October; besides this, there are long, withering droughts through July and August. The south and east of the county are in the freestone region, the north and west in the limestone region, and we are on the division line. The soils are so various that it would be impossible to obtain a 100-acre field that would not contain two, or even four, qualities or colors of soil. It frequently happens that a small brook, over which one can step, divides two distinct qualities of soil in respect both to color and to production. This county has some very productive land, but it is scattered about in patches.

The soils cultivated in cotton are uplands, valleys, and bottoms of rivers and creeks, and vary in color from gray to brown, mahogany, and blackish, and are composed of coarse sand, gravel, and clay, in varying proportions, in different places. Very *sandy soil* is found only in narrow strips near water-courses. The natural timber growth is oak, hickory, pine, poplar, walnut, maple, beech, birch, ash, cherry, gum, etc. Such soils have an average thickness of 6 inches, and extend 70 miles west, 40 east, 50 north, and 100 miles south. The subsoils are heavier than the surface soils; those of river bottoms and valleys are red, very stiff and tenacious clays, and those of portions of creek bottoms and flat uplands are yellow clay and less tenacious. They contain "black gravel" and a variety of pebbles, white ones excepted, and are underlaid by gravel and rock at from 10 to 30 feet.

The soils are difficult to till in wet seasons, and are early and warm, but ill drained. The chief crops of this region are corn, cotton, oats, pease, potatoes, wheat, barley, rye, etc., the first five being best adapted to this region. Cotton occupies one-third of the soil. The plant attains the height of from 3 to 8 feet, the higher the more productive. It inclines to run to weed on rich bottom land, and elsewhere if there is too much rain; early topping will check it and favor bolting.

The product per acre of fresh land varies from 600 to 800 pounds of seed-cotton, 1,485 pounds making a 475-pound bale of lint, which rates in the market as middling. After ten years' cultivation the product per acre is 400 to 500 pounds on uplands and five- to seven-tenths more on bottoms, 1,545 pounds then making a 475-pound bale of lint, which does not differ in quality from that on fresh land.

The troublesome weeds are hog-, rag-, and smart-weeds, and crab-grass is worse than all the rest combined. Not more than one-twentieth of the arable land lies "turned out", and the producing capacity of it has not again been tried. The slopes wash and gully readily, but are not yet seriously damaged, while the valleys are rather improved by the washings. Some slight and only partially successful efforts have been made to check the washing by horizontalizing, hillside ditching, and terracing.

ABSTRACT FROM THE REPORT OF JOHN H. DENT, OF CAVE SPRING.

The upland *red, clayey loam* includes two-thirds of the cultivated lands for 10 miles around, and bears a natural growth of oak, hickory, etc. The soil is 16 inches deep, and its tillage is difficult in wet seasons; it is late, cold, and ill drained. It is apparently equally well adapted to cotton, corn, oats, potatoes, sorghum, and clover, but cotton occupies half its area. The usual and most productive height of the plant is about 4 feet; it inclines to weed in wet seasons, and is restrained by topping. Fresh land produces 1,200 pounds of seed-cotton per acre, and the staple rates as good ordinary; after four years' cultivation the product is 900 pounds, and the staple compares favorably with that from fresh land. The most troublesome weed is rag-weed. About one-twentieth of this land lies "turned out", but produces well when again cultivated. The slopes wash and gully readily, but the valleys are only slightly injured by the washings. To save the slopes, horizontalizing and hillside ditching are successfully practiced.

The time for shipping cotton is from the 1st of October to the 1st of January. It is sent to Rome, Savannah, Charleston, and New York, the rate of freight being from \$1 50 to \$2 per bale.

POLK.

Population: 11,952.—White, 7,805; colored, 4,147.

Area: 330 square miles.—Woodland, all.

Tilled lands: 54,233 acres.—Area planted in cotton, 16,774 acres; in corn, 16,331 acres; in wheat, 6,538 acres; in oats, 6,114 acres; in rye, 28 acres.

Cotton production: 8,126 bales; average cotton product per acre, 0.48 bale, 690 pounds seed-cotton, or 230 pounds cotton lint.

The surface of Polk county is hilly and mountainous. Dug Down mountain extends along the southern and eastern sides of the county, trending east and west on the south side, but curving around to the northeast on the east side and presenting a steep escarpment toward the north and northwest. Three bands of nodular ridges extend from the north side of the county nearly to Dug Down mountain, leaving narrow valleys next to this mountain, which connect almost at right angles with the valleys that lie between the ridges. Cedar valley is 9 miles long and from 1 mile to 6 miles wide, and is a fine body of undulating upland, with a rich calcareous soil of a brown or red color and a red subsoil. Van's and Buharlee valleys are similar. (See analysis of soils, page 27.)

The valley lands on the western side of the county are generally sandy, and sand-rocks of small sizes are often scattered abundantly over the surface, especially in the valleys around or near Indian mountain. The valley lands are nearly all of the best grade of uplands, and, taken altogether, they embrace within the county about one-fourth of its extent. The gravelly gray lands, belonging mostly to ridges, cover about one-third of the extent of the county. In the central portion of the eastern belt the lands are approximately level or but slightly rolling, and are covered with a growth of long-leaf pine; but in the more broken areas, as elsewhere in lands of this character, the prevailing growth is that of the different varieties of oak, with hickory, chestnut, and short-leaf pine. Southeast and south of Dug Down mountain there is a limited area of poor, hilly lands with a gray sandy and rocky soil and a growth principally of red oak, short-leaf pine, and chestnut.

In relation to cotton culture, in comparison with other portions of northwest Georgia, the lands of this county show rather the best average yield per acre for this crop. This is owing in part to a somewhat more favorable climate, being the most southern county in this part of the state, as well as to the general fertility of the lands, which will bear a nearly equally favorable comparison in the production of the cereal and other crops.

ABSTRACTS FROM THE REPORTS OF S. M. H. BYRD, OF CEDARTOWN, AND T. J. THOMPSON, OF ROCKMART.

Lands are distinguished as bottom, valley, and hill lands. Valley and hill lands are best for cotton, especially the slopes facing to the south and southeast. The bottom lands are cold and late, and are well suited to corn, but not to cotton unless well prepared and stimulated by fertilizers. The bottom lands are always level, and lie along the streams. The valleys are from 2 to 10 miles wide and from 10 to 30 miles long, and are rolling. The soil of the valleys and hills is in all respects very much alike. Cotton in this county rates high, becoming inferior on old lands if not fertilized. The *mulatto* or *red land* is the best for cotton. Its soil is a red or brownish clay loam from 6 to 12 inches deep; the subsoil is heavier, and has the color of chocolate and dark red, which becomes somewhat impervious to water as the cultivation of the surface soil goes on. It is underlaid by iron ore and limestone. One-half the cultivated land is of this kind; it extends about 20 miles eastward and westward across northern Alabama. Its growth is post oak, red oak, and hickory. The best lands are held in tracts of from 400 to 2,000 acres; poorer lands in smaller divisions. The soil is easily tilled in dry, but with difficulty in wet seasons; it is early, warm, easily drained, and apparently best adapted to the cereals. The chief crops of the region are cotton, corn, oats, wheat, sorghum, potatoes, and clover. Cotton comprises half the crops on this land. The plant grows from 2 to 5 feet high, and is most productive at 5 feet; on fresh land or very rich spots it inclines to grow to weed, which may be restrained by using non-ammoniated phosphates. The seed-cotton product per acre of fresh land is from 800 to 1,000 pounds. After ten years' cultivation the product is from 500 to 600 pounds, but it takes more to make a bale. The most troublesome weeds are hog-weed, carrot-weed, and May-pop. One-fourth of this land (originally cultivated) now lies "turned out", but if the land is not badly gullied and washed it produces well when again cultivated. The slopes are seriously washed and gullied, but the washings rather improve the valleys. Horizontalizing and hillside ditching are practiced, and are partially successful in saving the soil of the slopes.

The second quality of soil (as described by Mr. S. M. H. Byrd) is designated *gray land*, which covers three-eighths of the cultivated land, and extends in the same directions and as far as the red land first described. Its timber is hickory, walnut, white oak, and ash. The soil is a whitish-gray loam, containing gravel, and is from 4 to 10 inches deep. The subsoil is heavier, has a pale red color, and contains flinty rock and white angular pebbles. The soil is easily tilled in any season, but the rocks and gravel are troublesome. It is a little late and cold, but naturally well drained, and is apparently best adapted to cotton, with which one-half its area is planted. The plant grows a little taller on this than on red land while fresh; on very rich spots, or on fresh land, it inclines to run to weed, which may be restrained by using phosphates. The product per acre of fresh or of old land is as given in the case of red land. When this soil begins to fail, poverty-weeds and cinquefoil will appear on it. A little more than one-fourth is "turned out"; it produces well for a few years when again cultivated.

The third quality of soil, as given by Mr. Byrd, is that of the *bottoms*, which includes one-eighth of the cultivated area, and extends as far as the red and gray soils. Its natural timber is white oak, ash, beech, birch, walnut, sycamore, linden, poplar, hickory,

elm, and maple. The soil is a fine silt loam of a whitish color when old or blackish when freshly cleared, and varies from 6 to 24 inches in depth. The subsoil is heavier, and varies from a good yellow clay to white or pipe-clay, and is somewhat impervious. This soil is difficult to till in wet seasons, is late and cold, and is best adapted to corn. Less than half of it is planted in cotton. The plant attains a height of from 3 to 7 feet, and is most productive at about 5 feet; it inclines to run to weed in ordinary seasons, and many believe that close planting will restrain it and favor bolling. Dry seasons are best for cotton on such land. The seed-cotton product per acre of fresh land is from 1,000 to 1,500 pounds, and the production does not decline nearly so rapidly as on rolling lands or uplands. The most troublesome weeds are cocklebur, rag-weed, and in some spots smart-weed. Excepting pipe-clay spots that never were rich, very little of this land lies "turned out".

Pine lands, as described by J. T. Thompson, of Rockmart.

The *pine belt* is 10 miles wide, extends into Floyd and Bartow counties, and is the most densely timbered pine land in northern Georgia. Its soil is variously composed of fine and coarse sand, gravel, and clay; its color varies from gray to brown and blackish, and reaches 3 inches below the surface. The subsoil is heavier; it is a light yellow, coarse sandy loam; in some places it is white pipe-clay, in others red clay. It is generally leachy, contains a variety of gravel, and is underlaid by sand, gravel, and generally much rock.

The chief difficulty encountered in tillage is the abundance of rock at the surface. The soil endures drought very well. It is early, warm, and well drained, and is apparently best adapted to cotton and oats. The land is poor and poorly watered, and has very few springs and very little running water. It is hard to prevent wells from caving in; they are as deep as 80 feet, at which depth it is hard to find water. Not much of this land is cultivated. The cotton-plant attains a height of from 18 to 36 inches, the higher the more productive; it all opens well, and does not run to weed. The soil rather needs fertilizers. In ten years its production is decreased one-third, without any material variation of the quality of the staple or ratio of seed to lint. Product per acre of fresh land is from 500 to 800 pounds of seed-cotton, and from 1,425 to 1,485 pounds make a 475-pound bale of lint as good as any in market. Crab-grass is the chiefly troublesome weed. Only a small amount of such land lies "turned out". Slopes wash and gully badly if the soil is not held by gravel; the damage is not serious, and the valleys are slightly benefited by the washings. To save the slopes a very little hillside ditching and horizontalizing is done, and with very good success.

Cotton is shipped, by railroad, to Cartersville at 50 cents per bale, or to Rome at \$1.25 per bale.

BARTOW.

Population: 18,690.—White, 12,419; colored, 6,271.

Area: 500 square miles.—Woodland, all.

Tilled lands: 88,231 acres.—Area planted in cotton, 21,969 acres; in corn, 26,874 acres; in wheat, 15,265 acres; in oats, 9,852 acres; in rye, 164 acres.

Cotton production: 10,111 bales; average cotton product per acre, 0.46 bale, 657 pounds seed-cotton, or 219 pounds cotton lint.

The surface of Bartow county is rolling and mountainous, with broad valleys of excellent lands. The mountains belong to the western escarpment of the metamorphic plateau extending into the east and southeast portions of the county. This is cut through by the Etowah river and by a number of smaller streams. West of this range for several miles the country is divided up without regularity of outline into nearly level valleys and steep slaty hills. Etowah river crosses the county from east to west, and about two-thirds of its surface is drained by this river and its tributaries.

The most valuable uplands are the red clay lands, commonly distinguished in this county as red mulatto lands. These lands are found around Cartersville, in Pine Log valley, and in various other localities, forming a large proportion of the cultivated area. The production is from 25 to 30 bushels of corn, from 8 to 15 bushels of wheat, and from 750 to 800 pounds of seed-cotton to the acre, fertilizers being used only with cotton.

Most of the valley land, particularly that of Oothcalooga valley, is argillaceous and more or less calcareous, and is cultivated principally in corn, wheat and oats. The soil varies in color here from a light red to a dark brown.

The gray gravelly ridge lands cover perhaps one-third of the surface of the county. In the southwestern corner of the county these lands are nearly level and somewhat sandy, and are covered with a prevailing growth of long-leaf pine, with red and post oaks. There are some gray and red sandy lands on the east side of the county that have not been cultivated to any great extent, but with fertilizers they give a good yield of cotton. In the southeastern part of the county the soil is of a light red color, and loose quartz-rocks are scattered abundantly over the surface. The alluvial lands of the Etowah river are somewhat sandy and very productive, yielding from 750 to 800 pounds of seed-cotton to the acre without fertilizers. That of the smaller streams, especially of all on the north side of this river, is more argillaceous, and is not suited to the cotton crop. (See analyses of soils, page 27.)

ABSTRACTS FROM THE REPORTS OF J. O. M'DANIEL, OF ALLATOONA, AND A. F. WOOLLEY, OF KINGSTON.

Both latitude and altitude make the season rather too short for cotton, but by the use of stimulating fertilizers a good average yield is obtained. The upland soils vary from red to gray, and the transition is often very abrupt. On the bottoms cotton is later than on the uplands, on account of later planting and coldness of the soil; it is therefore liable to be prematurely frost-killed.

The kinds of soil cultivated in cotton are: 1. Brown sandy loam of the hilly, rolling, and level table-lands; 2. Blackish clay loam of the low bottoms; 3. Gray gravelly clay of the uplands. The *brown sandy loam* of the table-lands, from 6 to 12 inches thick, includes half the arable area of this region, and extends across the southern part of the county. Its timber is hickory, walnut, white oak, ash, poplar, beech, etc. Its red subsoil is a very tough, tenacious, and impervious hard-pan, containing flinty, hard, rounded pebbles in small patches, but otherwise almost free from stone, underlaid by gravel and rock at from 15 to 20 feet. The soil is easily tilled in moderately dry seasons, and is early and warm, but ill drained. The chief crops are cotton, corn, wheat, oats, clover, pease, potatoes, and sorghum. This soil is best adapted to cotton, which occupies from one-half to two-thirds of its tilled lands. The plant usually attains a height of 30 inches, but is more productive at 36 inches. An excess of rain inclines it to run to weed; the remedy consists in shallow cultivation, and as little as possible of it. Fresh land produces 1,000 pounds of seed-cotton per acre. After thirty years' cultivation the product is 600 pounds per acre, about 1,485 pounds making a

475-pound bale of lint, which is shorter than and inferior to that from fresh land. Rag-weeds, hog-weeds, and crab-grass are most troublesome. One-fortieth of this land lies "turned out". When again cultivated it produces as well as when fresh, but does not last so long. Slopes do not readily wash or gully, but in some instances they are seriously damaged. Horizontalizing and hillside ditching are successfully practiced to check the damage.

The *blackish clay bottom soil* includes one-fourth of the arable land of this region. The soil is 6 inches deep, and is late, cold, ill drained, and rather difficult to till in wet seasons. The subsoil is heavier, and is an impervious, yellowish clay hard-pan, underlaid by gravel and rock at from 15 to 20 feet. The soil is apparently best adapted to corn, but one-third of the cultivated area is planted in cotton. The plant attains a height of from 3 to 6 feet, but is most productive at 4 feet. It runs to weed in wet weather, for which there is no remedy. The seed-cotton product per acre is from 1,000 to 1,500 pounds; after thirty years' cultivation the product is 800 pounds. About 1,425 pounds from fresh land and about 1,460 pounds from old land make a 475-pound bale. The staple from old land is inferior to that from new, but the difference is hardly appreciable. The most troublesome weeds are rag-weeds, morning-glories, and grass. None of this land lies "turned out".

The *gray gravelly upland clay soil* includes one-fourth of the cultivated area of this region, and is 6 inches deep. It is known to extend 10 miles around, and bears a natural growth of post oak, red oak, pine, black-jack oak, etc. The heavier subsoil is a light yellow, very stiff, impervious hard-pan, containing flinty, hard, angular gravel of white and other colors, and is underlaid by rock at from 30 to 50 feet. The soil is early, warm, but ill drained, and is difficult to till in wet seasons. It is apparently best adapted to cotton, with which one-half its area is occupied. The plant attains a height of from 2 to 3 feet; is most productive at 3 feet, and is not inclined to go to weed. The seed-cotton product per acre of fresh land is from 400 to 600 pounds; after thirty years' cultivation it is no less; 1,485 pounds from fresh land, or from 1,485 to 1,545 pounds from old land, make a 475-pound bale of lint. The staple from old land does not differ appreciably from that of new land; both are good. Crab-grass is the most troublesome weed. One-tenth of this land lies "turned out", and after a long rest produces very well again. Slopes are seriously damaged by the washing and gullying of the soil upon them; the washings also injure the valleys to the extent of 5 per cent. To check the damage horizontalizing and hillside ditching are very successfully practiced.

Shipments are made, as soon as the cotton is ready, by rail, to Atlanta at \$1 per bale.

THE BLUE RIDGE REGION (METAMORPHIC).

The Blue Ridge region embraces all of the counties of Rabun, Towns, Union, Fannin, Gilmer, Pickens, Dawson, Lumpkin, White, and Habersham. The north county-lines of the latter four rest on the crest of the ridge. The first five counties are out of the cotton region proper, and but a brief mention is necessary.

RABUN.

Population: 4,634.—White, 4,437; colored, 197.

Area: 400 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 18,209 acres.—Area planted in cotton, 45 acres; in corn, 8,810 acres; in oats, 455 acres; in wheat, 457 acres; in rye, 1,675 acres.

Cotton production: 14 bales; average cotton product per acre, 0.31 bale, 444 pounds seed-cotton, or 148 pounds cotton lint.

Rabun county occupies the extreme northeastern corner of the state, and is a region of mountains with comparatively little land suitable for tillage. It is well timbered (one-half pine on the mountains), and its soils are chiefly gray, sandy, and gravelly, with clay subsoils. A belt of red land enters the county from the southwest and reaches to Clayton, the county-seat. (For description of lands, see regional part, page 32.) The Atlantic and Gulf water-divide passes northward through the western part of the county. The lands of the Tennessee valley (2,000 feet above the sea) are generally level and highly productive, and here also are situated the largest farms. The county is too broken and transportation to railroad stations too difficult to make the culture of cotton very profitable.

TOWNS.

Population: 3,261.—White, 3,157; colored, 104.

Area: 180 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 14,198 acres.—Area planted in cotton, none; in corn, 7,001 acres; in oats, 830 acres; in wheat, 2,055 acres; in rye, 1,339 acres.

Cotton production: None.

Towns county lies on the north side of the Blue Ridge along the North Carolina line, and is drained by the headwaters of the Tennessee river, which flow northwestward. The surface is broken and well timbered. Its soils are gray, sandy, and gravelly, and underlaid by clay subsoils. (See regional description, page 32.)

No cotton is produced, except, perhaps, in small patches for home use. Corn is the chief crop, with some wheat and rye and a little oats.

NOTE FROM HOWELL C. STANDRIDGE, OF HIAWASSEE.—The soil, as a general thing, is of a dark gray color, though all varieties occur. Dark loamy soils are found on or near the mountains. Cotton in this county grows finely as far as the stalk is concerned, but does not mature. The seasons are too short and cold.

UNION.

Population: 6,431.—White, 6,321; colored, 110.

Area: 330 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 30,347 acres.—Area planted in cotton, 12 acres; in corn, 14,347 acres; in oats, 2,139 acres; in wheat, 4,612 acres; in rye, 1,934 acres.

Cotton production: 5 bales; average cotton product per acre, 0.42 bale, 594 pounds seed-cotton, or 198 pounds cotton lint.

Union county lies chiefly on the north side of the Blue Ridge. Its surface is mountainous and broken, well timbered, and drained by streams forming in part the headwaters of the Tennessee river. Soils are mostly gray, sandy, and gravelly, with clay subsoils, as in the adjoining counties. (See regional description, page 32.) The chief crop is corn, with an acreage five times that of any other crop.

NOTE FROM C. J. WELLBORN, OF BLAIRSVILLE.—The seasons are too short, and the shade is too great in this county for the successful production of cotton for market. It is only planted in patches, and while the plant grows luxuriantly it fails to mature or to open before the frosts come. The *red clay lands*, while not the best of the county, are the only ones on which cotton is planted, and then fertilizers are used. They comprise 10 per cent. of the county area, and have a growth of all varieties of oaks, hickory, walnut, buckeye, white, yellow, and spruce pine, cherry, and poplar.

FANNIN.

Population: 7,245.—White, 7,112; colored, 133.

Area: 390 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 27,197 acres.—Area planted in cotton, none; in corn, 14,220 acres; in oats, 1,005 acres; in wheat, 3,649 acres; in rye, 2,099 acres.

Cotton production: None.

Fannin county, on the north side of the Blue Ridge, resembles in general the other counties of the region in its metamorphic rocks, sandy and red clayey soils and clay subsoils, and in its timber growth. Its drainage is northward to the Tennessee river. The lands are described in the following abstract.

Cotton is scarcely planted, except in small patches.

ABSTRACT FROM THE REPORT OF ADAM DAVENPORT, OF MORGANTON.

The lands of the county vary greatly from one ridge to another, being in patches of from 1 acre to 20 acres each. They may be classed as—

Black sticky uplands, lying mostly on southern slopes, and hence better for cotton than the other lands. They comprise about 12 per cent. of the lands of the county, and have a growth of hickory, oak, walnut, honey-locust, mulberry, and spicewood. The soil has a depth of 10 inches, with a clay subsoil. The chief crops are corn, wheat, rye, oats, and potatoes, to the first of which this soil is best adapted. Cotton is planted only in a few small patches for home use, and yields about 600 pounds per acre. The lands are early, warm, well drained, and difficult to cultivate in wet seasons.

The *heavy mahogany-colored clay uplands*, having eastern or southern inclinations, comprise one-half the lands, and have a growth of oak, chestnut, pine, hickory, and black-jack. They are best adapted to wheat or corn.

The *sandy bottom lands* of Toccoa river have a dark-gray soil 2 feet in depth, and a growth of walnut, hickory, fir, buckeye, maple, etc. These are best adapted to corn and rye. Cotton grows luxuriantly, but is liable to be killed prematurely by frosts. Under the most favorable circumstances only about 100 pounds of lint are obtained per acre from these lands.

GILMER.

Population: 8,386.—White, 8,258; colored, 128.

Area: 480 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 30,273 acres.—Area planted in cotton, 122 acres; in corn, 16,178 acres; in oats, 582 acres; in wheat, 5,903 acres; in rye, 950 acres.

Cotton production: 32 bales; average cotton product per acre, 0.26 bale, 375 pounds seed-cotton, or 125 pounds cotton lint.

Gilmer county lies at the southwestern termination of the Blue Ridge. Its surface is rolling and in part mountainous, is well timbered, and is drained westward by the headwaters of the Coosawattee river. In general soil features it resembles the region already described. There is, however, a smaller percentage of its lands under cultivation (9.9 per cent. of county area) than in any county of the region excepting Rabun. Its chief crops are corn, wheat, rye, and oats. Scarcely any cotton is planted.

PICKENS.

Population: 6,790.—White, 6,645; colored, 145.

Area: 230 square miles. Woodland, all; metamorphic, nearly all.

Tilled lands: 26,834 acres, or 18.2 per cent. of county area.—Area planted in cotton, 2,210 acres; in corn, 12,774 acres; in wheat, 5,992 acres; in oats, 1,619 acres; in rye, 357 acres.

Cotton production: 734 bales; average cotton product per acre, 0.33 bale, 474 pounds seed-cotton, or 158 pounds cotton lint.

Pickens county is divided diagonally by the continuation of the Blue Ridge chain passing through the county from northeast to southwest. These mountains have an altitude of from 1,500 to 2,500 feet, while the rest of the county is broken and hilly. On the north of this range the county is watered by Talking Rock creek and its tributaries, flowing northwestward into the Coosawattee river. On the south are the headwaters of Long Swamp and Stone creeks, flowing southward, tributaries of the Etowah river.

The various schists and gneisses are found over the greater part of the county, forming by their decomposition their characteristic sandy and mulatto lands. East from Jasper, the county-seat, mica-schists at first appear, then a wide belt of sandstones, and finally gneisses at the county-line. To the west and northwest are found shales, sandstones, and mica-schists, with hornblendes near Talking Rock, and the lands are mostly sandy, with red and yellow clay subsoils. Cotton is produced only in patches. Nineteen per cent. of the county area is too mountainous for tillage, and of the remainder 33 per cent. has been cleared and is partially under cultivation. Wheat yields 5

bushels, corn 15 bushels, and oats 8 bushels per acre. On the northwest, where the Pine Log range of mountains cross the county, there are found white marbles of excellent quality. In other sections gold and other minerals exist.

The lands under tillage comprise 18.2 per cent. of the county area. Of this 8.2 per cent. is in cotton, averaging 9.6 acres per square mile.

DAWSON.

Population: 5,837.—White, 5,479; colored, 358.

Area: 180 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 24,958 acres.—Area planted in cotton, 2,189 acres; in corn, 14,906 acres; in wheat, 4,649 acres; in oats, 882 acres; in rye, 186 acres.

Cotton production: 850 bales; average cotton product per acre, 0.39 bale, 552 pounds seed-cotton, or 184 pounds cotton lint.

Dawson county touches the Blue Ridge chain only on the northwestern corner, but the rest of the country is hilly and broken. The rocks are highly micaceous, with the exception of an area of sandstone northwest of Dawsonville. There is a belt of red hornblende lands south of the town, but the lands in general are gray and sandy, with clay subsoils. The Chattahoochee and the Etowah rivers approach very near each other on the northeast, and are separated only by a low ridge. Twenty-one and seven-tenths per cent. of the county area is under tillage, and 8.8 per cent. of this is in cotton, averaging 12.2 acres per square mile. Ten per cent. of the county is too mountainous for tillage.

LUMPKIN.

Population: 6,526.—White, 6,075; colored, 451.

Area: 290 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 21,019 acres.—Area planted in cotton, 269 acres; in corn, 11,232 acres; in wheat, 2,781 acres; in oats, 1,554 acres; in rye, 582 acres.

Cotton production: 109 bales; average cotton product per acre, 0.41 bale, 576 pounds seed-cotton, or 192 pounds cotton lint.

Lumpkin is one of the chief gold-bearing counties of the state, Dahlonega being the center of large mining operations. The surface of the county is hilly, and in the north mountainous. The principal streams are the Etowah river and the Chestatee. Twenty-five per cent. of the county is too mountainous for tillage. The soils are of the gray sandy and red clayey varieties, with clay subsoils, usual to the metamorphic region. (See regional description, page 32.) The average yields are 12 bushels of corn, 7 of oats, and 15 of wheat per acre. The average of cotton product per acre is very high as compared with that of other counties of the metamorphic region. Tilled lands comprise 11.3 per cent. of the county area; of this 1.3 per cent. is devoted to cotton, which averages 0.9 acres per square mile.

Shipments are made by wagon to the nearest railroad station, and there mostly sold to local buyers.

John C. Brittain, of Dahlonega, says:

The altitude of this county is too great for the cultivation of cotton, being from 1,600 to 3,500 feet above sea-level. Consequently no cotton, except a little for home use, is made in the county.

WHITE.

Population: 5,341.—White, 4,751; colored, 590.

Area: 180 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 19,889 acres.—Area planted in cotton, 228 acres; in corn, 11,097 acres; in oats, 2,228 acres; in wheat, 2,319 acres; in rye, 489 acres.

Cotton production: 68 bales; average cotton product per acre, 0.30 bale, 426 pounds seed-cotton, or 142 pounds cotton lint.

The surface of White county is rolling and broken, largely mountainous, and well timbered. The topographical and agricultural features are fully given in the following abstract, taken from the unpublished geological report on this county made by the late Professor F. H. Bradley, formerly of the state survey:

Nearly half of the surface of White county is occupied by the spurs of the Blue Ridge, along whose crest lies the northern boundary-line. On the northeast we find the heavy mass of Tray mountain, with long, high spurs and deep, narrow valleys, including such small amounts of level land that all but the outermost portions are destitute of houses and fields. In the northwest, on the contrary, the Horse range, a distinct spur of the Blue Ridge, and running at right angles to its general trend through fully half the length of the county, furnishes considerable high, flat areas, upon which are located several farms. Between this and Buzzard mountain, still northwest, along Town's creek, a narrow belt of farms follows the Tassentee turnpike; and along Spoiled Cane creek, between the Horse range and Tray mountain, another belt follows the Unicoi turnpike far toward the crest of the divide. The valleys at the base of the mountains are from 1,500 to 1,700 feet above the sea, the mountains from 3,000 to 4,435 feet. Through the center and southern portion of the county there is a rather scattering string of isolated knobs, of which Yonah (3,168 feet high) is the most prominent. The valleys have mostly a southerly trend with the spurs of the Blue Ridge, excepting Nacoochee valley, which lies nearly due east and west and forms a sort of gathering place or "low-ground" for all the smaller streams, which here form the Chattahoochee river.

The valleys have generally a fertile soil, and are mostly cultivated, producing good crops of corn and serghum-cane, with smaller areas devoted to rice, hay, and pasturage. The second bottoms (or terraces, some 70 feet above stream-level) and lower uplands are mainly cultivated in corn and wheat, with some oats, tobacco, cotton, potatoes, etc., in small quantities for home use. Most of the bottom lands give evidence, by graves, pottery, implements, etc., of having been under cultivation for several centuries. While the vegetable portion of the soil has often recuperated through lying fallow for years and through having crops of weeds and grasses plowed under, yet the mineral portion has not thus been restored, except by the floods which occasionally overflow the lowest portions of the bottoms and deposit sediment.

The ridges of the lower half of the county are dry and mostly sandy. At the southern extremity they bear considerable areas of good yellow pine timber, together with tracts of scrubby oak, hickory, etc. Passing northward, the pine rapidly decreases and the hard woods increase in amount and variety. In the northern and more mountainous portion the forests have been less cut away, and the ridges, as well as the valleys, are therefore more abundantly watered and covered with a heavy growth of large timber—white, red, and Spanish oaks, hickory, black walnut, maple, chestnut, poplar, locust, cherry, gum, hemlock, holly, sassafras, etc. The soil here is mostly a black loam, and is covered with a scattering undergrowth of sourwood, etc., and an abundant growth of pea-vines, wild grasses, etc., thus making this a favorite pasture-ground.

HABERSHAM.

Population: 8,718.—White, 7,357; colored, 1,361.

Area: 400 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 28,365 acres.—Area planted in cotton, 1,762 acres; in corn, 14,797 acres; in wheat, 2,458 acres; in oats, 1,921 acres; in rye, 602 acres.

Cotton production: 597 bales; average cotton product per acre, 0.34 bale, 483 pounds seed-cotton, or 161 pounds cotton lint.

Habersham county has for its most prominent feature the various high mountain ranges and points, all well timbered. The Blue Ridge lies on the northern boundary, Tallulah mountain, an offshoot, trending southward to the Chattahoochee ridge. The surface of the country, exclusive of the mountains, is rolling, with valleys and uplands, and presents large areas of excellent lands for cultivation. Only 10 per cent. of the entire county is too hilly for tillage.

The rocks of the county comprise a great variety of the metamorphic series, and are highly siliceous. A belt of magnesian or talcose slates, with a limestone stratum of varying thicknesses, containing some galena, passes several miles south of Clarksville in a southwest course. The belt is so narrow that the lands on either side are not perceptibly benefited by the presence of the limestone. Lime-kilns have been in operation at several of these limestone exposures. The table-lands on the northeast have a sandy soil, derived from a dark sandstone (the almost exclusive rock), and are thinly settled, being too hilly for cultivation to any great extent.

Large areas of red-clay land occur in several portions of the county, especially on the north, where a belt 2 or 3 miles wide passes north of Batesville. (For description of lands and analyses, see general part, page 33.)

Tilled lands comprise 11.1 per cent. of the county area, and of this 6.2 per cent. is in cotton, averaging 4.4 acres per square mile.

The Raleigh and Augusta Air-Line railroad furnishes transportation to market.

ABSTRACT FROM THE REPORT OF C. H. SUTTON, OF CLARKSVILLE.

The red lands are the only ones devoted to cotton, and comprise the largest part of the area under cultivation. They have a soil 6 inches deep and a mica-clay subsoil. The growth is pine, oak, hickory, chestnut, ash, etc. Cotton comprises one-twentieth of the crops, and fertilizers are used to hasten its maturity. The yield is from 300 to 800 pounds of seed-cotton. The crops are troubled most with rag-weeds, cocklebur, Spanish needles, and crab-grass. The uplands wash readily if there is much mica-clay in the soil, otherwise not. But little damage is done. The crops of the county are corn, wheat, oats, potatoes, etc.

MIDDLE GEORGIA (METAMORPHIC).

This region embraces the counties of Franklin, Hart, Banks, Hall, Forsyth, Milton, Cherokee, part of Bartow,* Haralson, Paulding, Cobb, Fulton, De Kalb, Gwinnett, Jackson, Madison, Elbert, Oglethorpe, Clarke, Oconee, Walton, Rockdale, Clayton, Campbell, Douglas, Carroll, Heard, Coweta, Fayette, Spalding, Henry, Newton, Morgan, Greene, Taliaferro, Wilkes, Lincoln, and Columbia; parts of McDuffie, Warren, and Hancock; Putnam, parts of Baldwin, Jones, Bibb, and Jasper; Butts, Monroe, Pike, Upson, parts of Crawford, Taylor,* Talbot, Meriwether, Troup, Harris, and Muscogee.

FRANKLIN.

Population: 11,453.—White, 8,906; colored, 2,547.

Area: 330 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 61,117 acres.—Area planted in cotton, 16,901 acres; in corn, 20,523 acres; in wheat, 6,520 acres; in oats, 4,627 acres; in rye, 15 acres.

Cotton production: 5,723 bales; average cotton product per acre, 0.34 bale, 483 pounds seed-cotton, or 161 pounds cotton lint.

The surface of Franklin county is rolling and hilly, 5 per cent. being too much so for tillage. It is well timbered, and comprises the usual gray, sandy, and gravelly, as well as red-clay lands. (See regional description, page 34.) The latter chiefly prevails, a wide belt of a deep red color, derived from hornblende rocks, passing through from northeast to southwest. These are frequently covered by thin layers, 2 or 3 inches deep, of sandy soils, which, by intermixture with the clays, produce a mulatto soil, usually dark from decayed vegetation. The growth is hickory, dogwood, and various oaks. Twenty-eight and nine-tenths per cent. of the area of the county is under tillage, 27.7 per cent. of these lands, averaging 51.2 acres per square mile, being in cotton. Corn, wheat, and oats are the other chief crops.

ABSTRACT FROM THE REPORT OF O. C. WYLY, OF CARNESVILLE.

The lands of the county are intermixed very generally, and comprise the red and the gray sandy and gravelly. The general yield is 400 pounds of seed-cotton per acre on fresh lands, and an increase of 100 or 200 pounds after four years' cultivation. The lint rates as middling. One-sixth of the lands now lies out; they wash readily, doing much damage. These old lands produce cotton finely, and are troubled chiefly with crab-grass and hog-weed.

Shipments of cotton are made by the Elberton and Air-Line railroad, or by wagon, to Athens, at 50 cents per 100 pounds.

HART.

Population: 9,094.—White, 6,212; colored, 2,882.

Area: 330 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 39,759 acres.—Area planted in cotton, 14,923 acres; in corn, 14,312 acres; in wheat, 4,646 acres; in oats, 4,876 acres; in rye, 10 acres.

Cotton production: 5,094 bales; average cotton product per acre, 0.34 bale, 486 pounds seed-cotton, or 162 pounds cotton lint.

Hart is a rolling, timbered county, with level table-lands between the streams. Gray sandy lands, from mica-schists, cover almost the entire county south from Hartwell and north for several miles. Red lands then prevail to the Franklin county-line, formed from the decomposed hornblende rocks. (For character of lands, etc., see general description, page 29.) All of the lands of the county are considered tillable. The lands under cultivation comprise 18.8 per cent. of the county area; 37.5 per cent. of tilled lands is planted in cotton, averaging 45.2 acres per square mile. Its yield per acre is a little more than the average for the region.

ABSTRACT FROM THE REPORT OF C. W. SEIDELL, OF HARTWELL.

The gray lands are chiefly devoted to cotton. They cover two-thirds of the county, lie along the uplands at some distance from the creeks and rivers, have a sandy gray upland loam soil from 3 to 4 inches in depth, with generally a red-clay subsoil, and contain much quartz gravel. The growth is principally pine, with some oak, hickory, gums, ash, etc. The soil is early and easily tilled, producing cotton, corn, wheat, rye, oats, and potatoes. Cotton comprises two-thirds of the crop, grows to a height of 3 or 4 feet, runs to weed on very rich land, and yields about 250 pounds of seed-cotton per acre. Cultivation of three years improves it and increases the yield to 375 and 400 pounds. Crab-grass is the most troublesome weed. Very little of the land now lies out, and it washes but slightly on slopes. The bottoms of Savannah river are rich and productive, and are best adapted to corn. In this county the cotton crops are cut short by early frosts in the fall, but this is obviated by the use of fertilizers, which causes cotton to open in time to prevent damage.

Shipments are made to Augusta, Charleston, and Baltimore. The rates of freight are \$3 25 to Baltimore and \$2 75 to Charleston per bale.

BANKS.

Population: 7,337.—White, 5,830; colored, 1,507.

Area: 320 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 31,261 acres.—Area planted in cotton, 8,251 acres; in corn, 11,789 acres; in wheat, 3,036 acres; in oats, 2,022 acres; in rye, 24 acres.

Cotton production: 2,960 bales; average cotton product per acre, 0.36 bale, 510 pounds seed-cotton, or 170 pounds cotton lint.

Banks county, with its northern boundary resting on the Chattahoochee ridge at an elevation of a little over 1,600 feet above the sea, gradually declines southward from the foot of the ridge, the general elevation being then about 700 feet. The surface of the country is hilly, 2 per cent. being too much broken for successful tillage. Sixty-seven per cent. of the entire county is still covered with its original timber-growth of oaks, short-leaf pine, chestnut, hickory, and gum on the uplands, and gum, ash, maple, oak, and poplar on the bottoms and lowlands. The tributaries of Broad river flowing southeast into the Savannah, drain the surface of the county.

The usual variety of gray sandy and red clayey soils, with their clay subsoils, occur throughout the county. (See general description, page 34.)

Red clay lands cover the southern portion of the county, and a narrow belt lying 6 miles north of Homer extends in a southwesterly course across the county. These red lands are interspersed throughout with gray sandy soils, while the rocks, though chiefly hornblende, are associated with gray and micaceous gneisses. The lands along the streams are sandy, while the bottoms are narrow and present but small areas suitable for cultivation. The lands devoted to the cultivation of cotton are the uplands, which have a depth of from 6 to 10 inches and a red-clay subsoil.

The cultivated lands comprise 15.3 per cent. of the county area. Cotton is the second crop in acreage, and averages 25.8 acres per square mile, or 26.4 per cent. of tilled land. Its average product per acre is above that of the region at large, and also of the state.

ABSTRACT FROM THE REPORT OF C. C. SANDERS, OF GAINESVILLE.

This county is too near the mountains to produce cotton well. The cold and late springs incident to the high elevation above sea-level retard the growth of cotton in early spring and the early frosts of autumn prevent opening. With fertilizers and good cultivation the crops since the war have generally come in in sufficient time. Several classes of land may be distinguished, viz:

1. *The red, gray, and mulatto uplands*, covering three-fourths of the county, and best adapted to corn, wheat, oats, and potatoes, though cotton comprises one-third of the crops, and yields on fresh lands 800 pounds of seed-cotton per acre. After five years' cultivation (unmanured) the yield is only from 300 to 500 pounds, and 1,545 pounds are required for 475 pounds of lint. The stalk grows to an

average height of 3 feet, is most productive at 2½ feet, and inclines to run to weed in wet weather after a drought. Crab-grass is the most troublesome enemy to contend with. While these uplands wash readily on slopes, the damage done is but slight, and the valleys benefited by the deposits of sand and clay.

2. The *light sandy lands* extend but 2 or 3 miles along small creeks, are 1 foot in depth, and have a heavy clay subsoil. They are late, and well drained, easy to cultivate, yielding, when fresh, 1,000 pounds of seed-cotton per acre. After five years' cultivation the yield is from 600 to 900 pounds. But one-tenth of this land is planted in cotton, which grows to a height of about 4 feet, but is most productive at 3 feet.

3. The *high and dry sandy bottoms* of the creeks comprise but a small area for several miles along the creeks, and have a growth of oak, gum, poplar, and a depth of 18 inches. They are early, warm, and easy to cultivate in dry weather, and but very little cotton is planted on them. They yield from 1,000 to 1,500 pounds of seed-cotton per acre when fresh, and from 800 to 1,000 pounds after five years. Very little, if any, of the lands of the county is turned out to rest. Shipments of produce are made by railroad to Gainesville.

HALL.

Population: 15,298.—White, 13,040; colored, 2,258.

Area: 540 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 64,981 acres.—Area planted in cotton, 12,245 acres; in corn, 26,632 acres; in wheat, 8,771 acres; in oats, 4,798 acres; in rye, 369 acres.

Cotton production: 5,133 bales; average cotton product per acre, 0.42 bale, 597 pounds seed-cotton, or 199 pounds cotton lint.

Hall county is divided by the Chattahoochee river, on the south side of which, at a distance of several miles, a ridge forming the Atlantic and Gulf divide. The surface of the county north and south of this ridge is hilly and broken. On the north, and lying near the railroad line, is a narrow stratum of magnesian limestone, with associated galena in localities, accompanied by magnesian and talcose slates; but the belt of these is not wide enough to give to the lands any marked difference from those of the other rocks. In the southern part of the county there is a belt of red lands derived from decomposed hornblende rocks, which also comprise a large part of the lands of the county, though the gray sandy lands are most abundant, being derived from gneisses and mica-schists filled with gold-bearing quartz veins. (For description of soils, see page 34.)

Gold-mining is carried on extensively in the country north of Gainesville. Ten per cent. of the county is too hilly for tillage, and 30 per cent. has been cleared. The crops are corn, wheat, oats, cotton, potatoes, grapes, and fruits. The percentage of county area under tillage is the same as that of Hart (18.8 per cent.), cotton averaging 2.7 acres per square mile, or 18.8 per cent. of tilled lands. Cotton has been planted in this county since 1872, and only with the use of fertilizers.

The average yield of the county per acre is excellent, there being but nine counties in the state with a greater percentage.

ABSTRACT FROM THE REPORT OF DR. M. F. STEPHENSON, OF GAINESVILLE.

Cotton is planted equally on gray sandy and red uplands and on alluvial lowlands, and comprises one-fourth of the crops. The *upland and red lands* are considered the best, and constitute one-half of the area of the county. The soil has a depth of 2½ inches, with reddish-brown subsoil and a growth of oak, hickory, walnut, cherry, poplar, and pine. It is easy to till, and is early and well drained, producing half a bale, or 700 pounds of seed-cotton per acre on fresh lands. It is improved by cultivation, yielding the fifth year from 700 to 900 pounds of seed-cotton per acre. The stalk is most productive at a height of 2 feet, and is troubled most by rag-weeds. One-tenth of the land originally under cultivation now lies out, and when taken in again is almost as productive as when fresh, and fully as much if deep planting is practiced. These lands wash readily, but no serious damage is done.

The *gray sandy lands* are best adapted to cotton culture. They produce from 300 to 700 pounds of seed-cotton when fresh, but only 300 pounds after five years' cultivation. The growth is oak, hickory, dogwood, and poplar. The *bottom lands* have a fine, sandy loam soil from 5 to 12 feet deep, yielding from 400 to 600 pounds of seed-cotton after five years' cultivation.

Under the old system of farming the average yield was of wheat from 7 to 10 bushels per acre; now, under the new, the yield is from 20 to 30, and sometimes 40 to 46 bushels. Of corn cultivated 2½ inches deep without manure the yield ranged from 10 to 15 bushels; now, by turning under green crops in the fall, with lime composted with ashes and muck, the product is from 20 to 60 bushels, with promise of 100 and more. Clover is our main helper. Sheep-raising is being introduced successfully. Our people are slow to adopt modern improvements; only 14 farmers in the whole county have adopted modern systems, and they more than double their crops with the same labor. With 2½ feet of subsoiling they could quadruple their products. With proper tillage we can make 2 bales of cotton per acre, instead of half a bale; 100 bushels of corn instead of 15 bushels, and 50 bushels of wheat instead of 7.

We cling to the old and ancient system of "animalism"—just enough to live on—and let science go. Nine-tenths of our farmers feed all their crops with the same manure, without respect to character of soil or wants of each crop. I have raised 427 bushels of Irish potatoes from one acre, highly manured with ashes, which the year before made only 17 bushels. It is the kind of food, and not the quantity given to the crops, that produces best yields.

Shipments of cotton and other produce are made by railroad.

FORSYTH.

Population: 10,559.—White, 9,072; colored, 1,487.

Area: 250 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 53,042 acres.—Area planted in cotton, 12,121 acres; in corn, 20,324 acres; in wheat, 7,797 acres; in oats, 6,040 acres; in rye, 74 acres.

Cotton production: 5,044 bales; average cotton product per acre, 0.42 bale, 594 pounds seed-cotton, or 198 pounds cotton lint.

The monotony of a rolling metamorphic country is varied in Forsyth county by Sawnee mountain, a low range of hills north of Cummins, which passes at first in an easterly direction, connects with Coal mountain, and turns northward in the northeastern part of the county, forming the water-divide between the Chattahoochee and Etowah

rivers. The highest point of Sawnee mountain is only 400 feet above the surrounding country and 1,968 feet above the sea. The crest of the ridge is sharp and the sides rather steep, a micaceous sandstone (itacolumite) outcropping along the summit. Five per cent. of the county is too hilly and broken for tillage, and one-half of the rest has been cleared. The northern part lies in the gold belt, and its lands are mostly gray sandy and gravelly, with narrow belts of red clays.

In the central part there is a belt of red and mulatto lands 6 or 8 miles wide, from mica-schists and some hornblende gneisses, while on the south the lands are again gray and gravelly, with large quartz fragments lying on the surface. This also is gold-bearing. One-third of the county area is under tillage, and of this 22.9 is in cotton, which has an average of 48.5 acres per square mile. The soils are described in the following abstract:

ABSTRACT FROM THE REPORT OF H. C. KELLOGG, OF PLEASANT GROVE.

The lands may be classed as follows: *Red or mulatto uplands*, covering three-fourths of the county, with a sandy clay soil from 6 to 18 inches deep and a subsoil mostly of red clay, firm and compact, and which drains easily. These lands are best adapted to corn and wheat, though of late years the culture of cotton has increased 100 per cent., and it now comprises one-third of the crops. The average yield on fresh land, and also on land ten years in cultivation, is 600 pounds per acre, or 800 when manured, 1,485 pounds making 475 pounds of "middling" lint from fresh and 1,425 pounds from old lands, the lint then rating as good middling. The lands are found to produce cotton better when old than when fresh, and hence only 10 per cent. of the lands now lie out, while a few years ago there was 20 per cent. Very little damage is done by washing of the hills. Rag-weed and crab-grass are troublesome.

The *gray sandy and gravelly lands*, covering one-fourth of the county, are found mostly on ridges, and have a light red or yellow subsoil at 6 inches depth. Cotton very seldom runs to weed on this land, but grows to a height of 3 feet, and produces, when fresh and after four years' cultivation, 500 pounds of seed-cotton per acre, the staple rating the same as on red lands. These old lands are also considered best for cotton.

Cotton is shipped, soon after ginning, by wagon, to the railroad, and thence to Atlanta. Rates are 90 cents for 40 miles, and \$1 for 50 miles, per bale.

MILTON.

Population: 6,261.—White, 5,484; colored, 777.

Area: 110 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 30,629 acres.—Area planted in cotton, 9,989 acres; in corn, 13,039 acres; in wheat, 4,187 acres; in oats, 3,025 acres; in rye, 113 acres.

Cotton production: 4,490 bales; average cotton product per acre, 0.45 bale, 642 pounds seed-cotton, or 214 pounds cotton lint.

The surface of Milton county is rough and broken, the water-divide between the Chattahoochee and Etowah rivers passing through it. The lands are largely gray sandy and gravelly, with clay subsoils, and their surface is covered with quartz fragments from the many large veins and seams (gold-bearing) that intersect the mica-schists and gneisses. In some localities the rocks are highly garnetiferous, covering the soil with this small rounded material. The county is well timbered with oak, hickory, and pine, and a variety of undergrowth.

Ten per cent. of the area of the county is either too hilly or too swampy for cultivation, and about 40 per cent. has been cleared. The uplands yield 15 bushels of corn per acre when cultivated.

The lands are similar in character, and the methods of culture are the same as in the lower part of Forsyth county, and 43.5 per cent. of the county area is under cultivation; 32.6 per cent. of this is in cotton, the average being 90.8 acres per square mile. The average yield of cotton for the county is excelled but by five counties of the state, due probably in part to the rich alluvial valley lands of the Chattahoochee river on the southern border.

Cotton is hauled by wagon to the railroad, and thence shipped to Atlanta.

CHEROKEE.

Population: 14,325.—White, 12,699; colored, 1,626.

Area: 470 square miles.—Woodland, all; northwestern, 11 square miles; metamorphic, 459 square miles.

Tilled lands: 63,289 acres.—Area planted in cotton, 13,739 acres; in corn, 26,330 acres; in wheat, 10,283 acres; in oats, 5,172 acres; in rye, 416 acres.

Cotton production: 5,615 bales; average cotton product per acre, 0.41 bale, 582 pounds seed-cotton, or 194 pounds cotton lint.

The entire surface of Cherokee county is hilly, 15 per cent. being too broken for cultivation, especially in the northwest and west, where the Pine Log range of mountains passes through the county. On the east the lands are more level, and on the south, along Little river, they are undulating.

The lands embrace the usual gray sandy and gravelly and the red clayey varieties common to the region. (See general descriptions, page 32.) A few miles south of Canton small common garnets cover the lands in great abundance.

The surface of the county is well timbered with oaks and hickory, and is comparatively sparsely settled.

The dark gray gravelly lands predominate, especially in the northern part of the county, and are interspersed throughout with small patches of red. On the south of Canton there are a number of narrow belts of red lands derived from hornblende rocks. The largest of these belts has a width of several miles. Twenty-one per cent. of the county area is under tillage, and 21.7 per cent. of these tilled lands are in cotton, the average being 29.2 acres per square mile; its yield per acre is large.

The following experiment of M. S. Paden, of Woodstock, was reported to the state department of agriculture:

Soil, gray and sandy, with a mulatto subsoil, was cleared about thirty years ago. Original growth, red oak and black-jack, with some chestnut and pine. The land had been lying out since the war, and had grown up in sassafras and young pines. When again cleared and planted the yield of the rows was about 245 pounds of seed-cotton per acre. Those rows having 200 pounds of fertilizers per acre freshly applied yielded from 840 to 1,085 pounds per acre. The application of lime alone gave a yield of 490 pounds per acre. Eight different brands of commercial fertilizers were separately used in this experiment, the result of each being noted.

ABSTRACTS FROM THE REPORTS OF ELIAS C. FIELD, OF CANTON, AND M. S. PADEN, OF WOODSTOCK, NEAR THE COBB COUNTY-LINE.

The lands of the county are: 1. The *red clay or mulatto uplands*, considered the best in the county, though comprising but one-fourth of the area with its belts and patches. Corn succeeds better than cotton on this soil, though the latter comprises one-half of the crops. Six hundred pounds of seed-cotton per acre are raised on fresh and 400 pounds on old lands of ten years' cultivation. Three feet is the most productive height of the stalk, and very heavy manuring and topping are practiced to prevent its running to weed in wet weather. The most troublesome weeds are cocklebur and hog-weeds. The cotton rates as good middling. The growth on the uplands is post oak, poplar, hickory, with some buckeye. The soil is 6 inches deep, and has a deep red-clay subsoil, rather free from sand, which bakes very hard when first exposed, but gradually partakes of the nature of the soil. It is quite impervious when undisturbed. The lands formerly worn out are now considered the best cotton lands of the uplands, as they are loose and sandy, and fertilizers can be used to great advantage.

2. The *light sandy bottom lands* are thought by some to be the best cotton lands of the county. They extend along the streams in small patches sometimes for miles, and have a growth of pine, sweet gum, sourwood, and poplar. The depth is but a few inches to a very stiff mulatto subsoil, which is underlaid by sand and gravel at 2 feet. Cotton comprises 25 per cent. of the crops on these lands. They have a productiveness equal at first to the red lands, but wear out more rapidly. In ten years the land produces but 200 pounds per acre without the aid of fertilizers, and as a consequence about one-half of this land now lies out. Sorrel and "poor Joe" are the most troublesome weeds.

3. The *dark sandy second bottoms* of the streams comprise but a small proportion of the lands of the county, and differ from the sandy first bottoms in yielding but 500 pounds of seed-cotton per acre at first and 300 after ten years' cultivation, and in having as troublesome weeds the Spanish needles and smart-weed. One-fourth of this land now lies out, and is injured one-fourth by the washings of the hills. The growth of these bottoms is beech, birch, willow, and sweet and black gums.

Cotton on the low and flat lands is liable to be late and is more subject to being killed by frost than on the uplands, and hence the latter are preferred as cotton lands. In this county the crops are slow in starting, but grow very rapidly through the latter part of May and on until matured. Before the late civil war very little cotton was planted in this county, but by the use of fertilizers it has been brought up to a high standard.

As soon as ready, cotton is shipped by the North Georgia narrow-gauge railroad to Marietta at 40 cents, or to Atlanta for \$1 per bale.

BARTOW.

(See "Northwest Georgia")

HARALSON.

Population: 5,974.—White, 5,821; colored, 153.

Area: 330 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 28,225 acres.—Area planted in cotton, 4,860 acres; in corn, 13,048 acres; in wheat, 4,909 acres; in oats, 2,736 acres; in rye, 88 acres.

Cotton production: 2,035 bales; average cotton product per acre, 0.42 bale, 597 pounds seed-cotton, or 199 pounds cotton lint.

The Dug Down mountains of Haralson county form the northern limit of the metamorphic region in this part of the state. Southward from the mountains the surface of the county is well timbered, broken, and hilly, with mostly the dark-gray sandy lands described in the general part, page 32. A red clay belt crosses in a southwesterly course into Carroll county. Seven and one-half per cent. of the surface of the county is said to be too hilly for cultivation, and 3 per cent. is of irreclaimable swamp. The rocks are the usual metamorphic gneisses and mica-schists, filled with gold-bearing quartz seams and veins.

The tilled lands embrace 13.4 per cent. of the county area. Of these 17.2 is in cotton, its average being 14.7 acres per square mile. The yield per acre is more than that of the region or of the state at large.

ABSTRACT FROM THE REPORT OF W. O. M'BRAYEE, OF DRAKETOWN.

The cotton lands of the county may be classed as gray uplands, red uplands, and white pine woods soil.

1. The *gray sandy uplands*, with oak and hickory growth, comprise two-thirds of the county area, and are best adapted to corn, wheat, and oats, though 60 per cent. is planted in cotton. The yield is 800 pounds of seed-cotton per acre on fresh lands and from 500 to 700 pounds after five years' cultivation. Rag- and hog-weeds are most troublesome. The lands wash readily after three or four years, but the damage done is not great. Efforts to check it are made by hillside ditching and by rock dams.

2. The *red lands* extend northeast or southwest indefinitely, and are from 3 to 10 miles wide. The growth is hickory, oak, chestnut, poplar, dogwood, buckeye, persimmon, and black gum. In all respects these lands resemble the gray sandy lands already mentioned.

Shipments of cotton are made to Atlanta and Rome.

PAULDING.

Population: 10,887.—White, 9,903; colored, 984.

Area: 340 square miles.—Woodland, all; northwestern, 46 square miles; metamorphic, 294 square miles.

Tilled lands: 52,654 acres.—Area planted in cotton, 16,158 acres; in corn, 21,953 acres; in wheat, 6,372 acres; in oats, 6,101 acres; in rye, 116 acres.

Cotton production: 7,352 bales; average cotton product per acre, 0.46 bale, 648 pounds seed-cotton, or 216 pounds cotton lint.

The northern part of Paulding county, perhaps comprising one-half of its entire area, is very hilly and broken. The Dug Down mountain chain covers a large portion of it. A water-divide also comes in from the Lost and Kennesaw mountain range on the east and turns southwest and south into Carroll county. The streams are thrown

into three directions by these ridges, those on the north emptying into the Etowah river, those on the southeast into the Chattahoochee, and the rest into the Tallapoosa, on the southwest. On the south the country is rolling but nearly all tillable. The entire county is well timbered, and about 53 per cent. is said to be cleared, 8 per cent. being too mountainous or rocky for tillage. Gold and copper ores and asbestos are found in the county. A small area of the county on the north is covered by the conglomerates and sandstones of the northwestern region. Its lands are sandy, and the section is but little in cultivation, except along the larger streams.

Over the rest of the county southward the red clays and gray sandy soils are found intermingled throughout, but all have yellow or red clay subsoils, and are similar to other lands of the region (see pages 32, 33). The red lands form one or two narrow belts across the county, agreeing in course with their accompanying hornblendic rocks, viz, southwest and northeast.

In going from Dallas to Draketown, on the southwest, red lands are found to predominate for the first 4 miles; then a belt of 2 miles of gray sandy lands is crossed, followed by three-fourths of a mile of red lands again. Thus they alternate through the county. On the southeast they alternate in belts of from one-half mile to one mile in width. Granite outcrops are abundant in this southeast section. One area 4 miles south of Dallas has a width of 4 miles and a growth of long-leaf pine. Tilled lands comprise 24.2 per cent. of the county area. Of these 30.7 are in cotton, with an average of 47.5 acres per square mile. The crops of the county are cotton, corn, wheat, oats, and potatoes.

Cotton is one of the principal crops of the county, and with the aid of fertilizers the average yield per acre is high. But four counties of the state are above it in this respect.

ABSTRACT FROM THE REPORT OF J. R. PREWETT, OF DALLAS.

The gray sandy and the red clay lands are chiefly devoted to cotton culture. The *gray sandy* lands comprise three-fifths of the area of the county, and has a depth of 4 inches, a yellow-clay subsoil, and a growth of post, white, and red oaks, hickory, pine, and some poplar. Cotton, which comprises one-half of the crops, grows to a height of from 3½ to 4 feet, and yields 900 pounds of seed-cotton per acre on fresh land. Ten years' cultivation (unmanured) reduces this yield to 450 pounds, and 1,545 pounds are then required to make 475 pounds of lint. Rag-weed gives cotton crops most trouble. One-fifteenth of these lands now lies out, and with ten or fifteen years' rest yield as well as at first. Both uplands and valleys are injured to some extent by the washing away of the soil and the formation of gullies. Some farmers make efforts to check the damage, and with good success.

The *red lands* have a growth of oak and hickory and an orange-red sandy clay loam soil 6 inches in depth, underlaid by red clay. The soil is early, warm, well drained, and difficult to till in wet seasons. Cotton comprises one-third of the crops, grows to a height of 3½ feet, and yields 600 pounds of seed-cotton per acre on fresh land. Ten years' cultivation (unmanured) reduces this yield to 300 pounds. Two per cent. of this land now lies out, and unless fertilized does not yield well again. The uplands do not wash much.

Shipments of cotton are made to the various towns along the railroad, by wagon, at 40 cents per 100 pounds.

COBB.

Population: 20,748.—White, 14,734; colored, 6,014.

Area: 400 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 88,578 acres.—Area planted in cotton, 27,250 acres; in corn, 29,699 acres; in wheat, 10,147 acres; in oats, 6,789 acres; in rye, 85 acres.

Cotton production: 13,092 bales; average cotton product per acre, 0.48 bale, 684 pounds seed-cotton, or 228 pounds cotton lint.

The surface of Cobb county is rolling and hilly, with also a number of isolated and prominent low mountains. A dividing ridge, or water-divide, passes through the county, Sweet mountain on the northeast, Black Jack and Kennesaw in the center, and Lost mountain on the west, being prominent points of the ridge, without which it would hardly be noticed, on account of the slight elevation.

The first two of these mountains are composed of quartz-rock almost exclusively, and are situated on the southeastern side of a broad belt of deep red lands derived chiefly from hornblendic rocks. (See analysis, page 35.) Kennesaw and Lost mountains are composed of hornblendic gneisses and schists, and are in the northern part of the red belt as it passes westward out of the county. Kennesaw is the most prominent of these mountains, standing out so high above the rolling country around as to be seen from a great distance. All of these mountains have narrow summits and abrupt sides, their trends following the course of the red belt as marked on the map. On the north of this water-divide are Allatoona and Noonday creeks, flowing northward into the Etowah river; on the south the drainage of the streams is into the Chattahoochee river. On the north, at the Cherokee county-line, the red belt has a width of only 3 or 4 miles, which increases to 8 or 10 miles after it reaches the middle of the county and turns westward. The soil is deep and usually quite free from gravel. In the northwestern corner of the county the country is rolling, with a gray sandy soil full of quartz gravel, overlying a red and yellow clay subsoil at depths of from 6 to 12 inches. Some red land is found in this section also. This part of the county is gold-bearing.

On the south of the red belt the soils are very changeable. A large granite area lies between Marietta and Powder Springs on the southwest, the soils of which are gray and deep sandy. Associated with it are gray gneisses, with biotite mica and mica-schists. This last, with quartz seams, covers nearly all the eastern and southeastern portions of the county, which is rolling and hilly, the valleys between the hills being chiefly cultivated. The soil is usually gray and sandy, though occasional red spots of an outcropping syenite or decomposed hornblendic rock appear. On cultivation, the thin sandy soil becomes mixed with the clay subsoil, and a reddish or mulatto soil is the result.

The river valleys are not very wide, unless at some turn of the river where the current has been so long thrown against the opposite bank as to wear it away and leave an alluvial deposit in the bend. Some of these are subject to overflow, and all are very productive. The county is well timbered, and 34.6 per cent. of its area is under cultivation. Of the tilled lands 30.8 per cent. is in cotton, the average of that crop being 68.1 acres per square mile. Cobb is one of the two counties of the state having the highest average yield of cotton per acre, almost half a bale.

Shipments of cotton are made from Marietta to Atlanta by railroad.

J. T. Lindley, of Powder Springs, reports to the department of agriculture the results of an experiment on the dark mulatto land that has been under cultivation thirty-three years :

Fertilizers occasionally used; original growth, oak, hickory, and chestnut; yield without fertilizers, 700 pounds of seed-cotton; yield with 200 pounds commercial fertilizers from 1,000 to 1,470 pounds of seed-cotton. Another experiment with 300 pounds of fertilizers yielded 2,650 pounds of seed-cotton.

ABSTRACTS FROM THE REPORTS OF H. M. HAMMETT, OF MARIETTA, AND JAMES ROSWELL KING, OF ROSWELL.

The seasons in this county being very short, it is found necessary to use fertilizers to hasten the maturity of cotton crops. A *sandy loamy soil* is best adapted to the cultivation of cotton, comprising two-thirds of the lands of the county, and having a growth of pine, post, red, and white oaks, and hickory, poplar, and beech, a depth of 10 inches, and a grayish-red clay subsoil. The soil contains much quartz gravel. It is late, ill drained, and easy to till in wet but difficult in dry seasons, and is best adapted to corn; but if fertilized, cotton grows best. Cotton forms one-third of the crops, grows to a height of from 2 to 3 feet, and produces from 500 to 700 pounds per acre on fresh lands. Three years' cultivation reduces the yield to 300 pounds. The plant is inclined to run to weed when planted too close on rich land in wet weather, or when it is fertilized by strong stable manure. The usual methods of restraining it are topping and the use of commercial fertilizers. The staple rates as low middling, but the fiber is shorter on old lands. Rag-weeds and crab-grass are most troublesome on these lands, about 10 per cent. of which now lie out, but after a rest they produce as well as at first. They wash readily, doing serious damage in some places, but improving the valleys. Hillside ditching is employed to prevent this, and with satisfactory results.

The *red clay lands*, interspersed with the gray, cover about one-fourth of the county, and have a heavier subsoil at a depth of from 5 to 10 inches, containing flinty angular pebbles. The growth is post and red oaks, hickory, and pine—more hickory than on the sandy lands. It is easily tilled in dry weather, is cold and ill drained, and is best adapted to small grain, though cotton comprises about half the crops. The height usually attained by cotton on this soil is 3 feet, and it yields from 250 to 500 pounds of seed-cotton per acre, 1,545 pounds being required for 475 pounds of lint, rating as low middling. Three years' cultivation reduces this yield to 150 or 250 pounds of seed-cotton. Very little of this land now lies out, and it does not as readily wash as the sandy land.

FULTON.

Population: 49,137.—White, 28,295; colored, 20,842.

Area: 200 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 38,735 acres.—Area planted in cotton, 10,038 acres; in corn, 13,988 acres; in wheat, 2,836 acres; in oats, 3,069 acres; in rye, 24 acres.

Cotton production: 4,285 bales; average cotton product per acre, 0.43 bale, 609 pounds seed-cotton, or 203 pounds cotton lint.

The surface of Fulton county is rolling and well timbered, and mostly suitable for tillage, 2½ per cent. being said to be too broken.

The Atlantic and Gulf water-divide, entering the county from the east, turns southward at Atlanta to East Point and into Clayton county. The altitude of Atlanta is 1,050 feet above sea-level and 288 feet above the Chattahoochee river where crossed by the Western and Atlantic railroad.

The country north of Atlanta is covered with a gray sandy, gravelly soil, with large fragments of quartz-rock lying upon the surface and thickly deposited in many places, derived from somewhat gold-bearing quartz seams in the mica-schists and gneisses which form these lands. On the extreme north, near the river, there are large areas of gray lands, and these are also found on the west of the city toward the river.

On the southwest there is a large granitic area, with many abrupt and rounded hills and huge masses of granite, forming a rough and broken country. The rocks are coarsely crystalline, and are accompanied in some places by hornblende material. The lands are gray, sandy, and gravelly, the material being usually coarse; the subsoils are yellow and red clays, which sometimes are exposed by denudation. Narrow belts of red lands also accompany the hornblende outcrops of the section. The country embraced by the granite is bounded by Sandy creek on the north, while the Central railroad lies a little to the east of it, extends into Campbell county on the south, and on the west is separated from the river by a narrow belt of itacolumite sandstone and mica-schists.

The southeastern part of the county has a great variety of soils, derived from mica-schists, hornblende, gray gneisses, and steatites (soapstone). The red clay soils seem to predominate, and when sandy soils exist the red-clay subsoil approaches frequently so near the surface as to be turned up by the plow, forming with the gray soil a red mulatto land.

A prominent ridge of soapstone or saponite, with asbestos and serpentine, begins 3 miles south of Atlanta, and, passing along the south side of South river near the county-line, enters De Kalb county. The valleys formed in the bends of the rivers are in some places quite broad, and have a rich and highly productive sandy loam soil. They are, however, devoted to corn, as cotton is too liable to injury from early frosts and is too late in maturing. The stalk also is inclined to run to weed. The lands under tillage comprise 30.3 per cent. of the county area, cotton being the chief crop, its acreage embracing 25.9 per cent. of the tilled lands, and averaging 50.2 acres per square mile. The average yield is comparatively high, the county ranking ninth in the state in its cotton product per acre.

The city of Atlanta is the market for the cotton product of many of the counties, a large cotton factory using much of that brought in; but the greater part, after being reduced in bulk at the Morse steam cotton-compress, is shipped to northern or European markets over the many railroad lines that center in the city. The rates of freight are per 100 pounds.

The following experimental results were reported by Colonel I. W. Avery, of Atlanta, to the department of agriculture:

The soil was an ordinary clay land with a clay subsoil, that had been cleared for fifty years and manured the previous year. The yield in 1879 was 500 pounds of seed-cotton per acre without fresh manures; with 200 pounds of commercial fertilizers of various brands, and applied alone and in composts, on twenty-five experimental plats, the yield varied from 700 to 1,380 pounds of seed-cotton per acre, eighteen of the plats yielding over 1,000 pounds each per acre.

ABSTRACTS FROM THE REPORTS OF J. C. TUCKER, OF BEN. HILL P. O., AND THOMAS MOORE, OF BOLTONVILLE.

The *uplands*, with their gray and red soils, are the cotton lands of the county, one-third of the area under cultivation being devoted to that crop. The growth of the uplands is poplar, hickory, a variety of oaks, pine, sweet and black gums, and occasionally ash and dogwood. The soil has usually a depth of 6 inches over a red and sometimes yellow subsoil, which bakes in the sun and wind. The land is early, warm, well drained, and easy to till, producing crops of corn, cotton, wheat, oats, potatoes, and sorghum, but is adapted to corn, cotton, and oats.

Cotton grows to a height of 2 feet in dry and 3 feet in wet seasons, producing 600 pounds of seed-cotton on fresh lands. After four years' cultivation this yield is reduced to 400 pounds, and in ten years to 300 pounds. The staple also is shorter and the seed lighter.

About one-half of this land now lies out and is grown up in sedge-grass or in old-field pines or "pine orchards". The latter do well when taken in again, but lands covered with sedge-grass remain poor for a year or two. Most of the fields are cut up by the washings of the land. Hillside ditching, and also deep plowing, prevent this damage to a great extent. Crab-grass is the chief enemy to crops on these uplands. The rag-weed is very common.

DE KALB.

Population: 14,497.—White, 9,954; colored, 4,543.

Area: 280 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 60,023 acres.—Area planted in cotton, 19,318 acres; in corn, 21,034 acres; in wheat, 5,866 acres; in oats, 5,974 acres; in rye, 36 acres.

Cotton production: 8,008 bales; average cotton product per acre, 0.41 bale, 591 pounds seed-cotton, or 197 pounds cotton lint.

The surface of De Kalb county has the usual undulating character of the metamorphic region. Stone mountain, a bald mass of granite, is the most prominent point in the county, and the village near its foot, Stone Mountain, formerly had the name of New Gibraltar. These granites extend east and south over the rest of the county, covering it with gray sandy and gravelly soils and yellow clay subsoils. Over the rest of the county are found the usual red clay and gray sandy lands, with the intermediate grades of mulatto.

A red belt, and the only one of any extent, passes through the county, via Decatur, from Gwinnett, into Fulton county, south of Atlanta, and has a general width of about 5 miles. North of this the lands are gray and gravelly, with fragments of quartz on the surface, and are slightly gold-bearing. On the south of the red belt the county is also gray sandy until the ridge of soapstone or saponite is reached in the southern portion. This ridge enters from Fulton county with an easterly trend, but is not continuous. Asbestos (short fiber) is associated with the rock. The lands from these rocks are rather red, but the area is not very great, and the magnesian character of the material, from decomposition, is lost in the soil by its large intermixture with other constituents. Seventy-five per cent. of the county is said to have its original timber growth.

A little more than one-third of the county area is under cultivation. Cotton acreage is less than that of corn, but comprises 32.2 per cent. of the tilled lands, and averages 69 acres per square mile. Fertilizers are used in its culture, and the yield for the county is very good. There are but fourteen counties of the state having a greater average yield.

ABSTRACTS FROM THE REPORTS OF F. A. RAGSDALE, OF LITHONIA, AND T. J. FLAKE, OF PANTHERSVILLE.

The soils may be classed as bottom and upland gray, red, and mulatto lands. There is but little bottom land in the county, and it is seldom planted in cotton, as that crop runs too much to weed and matures too late; corn and oats alone are planted. The uplands are very much mixed. The mulatto soil is best for all crops, the red next; but the gray is easier cultivated, and the increase in the number of acres to both stock and hands renders the gray soil preferable for cotton. One hand, with a mule, can cultivate so much more of the gray lands than of the red or mulatto that the result is a greater total number of bales.

The *gray upland soils* cover about two-thirds of the county. They are usually gravelly and fine sandy to a depth of 3 or 4 inches, and have a stiff clay subsoil. These lands are moderately well drained and easy to till. The chief crops of the county are corn, cotton, wheat, oats, and sweet potatoes, but this land is best adapted to cotton and oats. The former grows to a height of 30 inches, producing from 700 to 800 pounds of seed-cotton per acre when fresh, or from 300 to 400 pounds after six years' cultivation. Crab-grass and "poor Joe" are most troublesome on gray soils. One-fifth of these lands now lie out, and when taken in again yield about 500 pounds of seed-cotton per acre. They suffer serious damage by washing on slopes, but the valleys are not much injured by it. Hillside ditching is practiced to obviate the damage.

The *red uplands* are not continuous, and are the wheat lands of the county. They have a growth of oak and hickory principally, with some chestnut, poplar, black-jack, ash, etc. The soil is a stiff red clay, which, when exposed to the sun, bakes and becomes very hard, and plowing is then impossible. It has a depth of 4 or 5 inches, and contains hard, rounded, and angular rocks. When well drained it is earlier than the gray soil. Cotton grows to a height of from 30 to 48 inches, producing 800 pounds of seed-cotton per acre when fresh and 600 pounds after six years' cultivation. About 10 per cent. of this land now lies out, but after a rest of two or three years it is equal to fresh land.

"*Ginger-bread*" *mulatto soils* cover about one-sixth of the county, interspersed with the red and the gray. The growth is oak, hickory, dogwood, poplar, etc. Its depth is 5 or 6 inches over a heavier subsoil, which, when broken up, becomes much like the surface soil. It is easier cultivated than the red, and resembles it in productiveness. The *bottom lands* are not devoted to cotton, as it usually runs to weed too readily and matures too late. These lands are therefore given up to corn and oats. Near the creeks and rivers the crop is most liable to be killed earlier by fall frosts than a few miles away, on the ridges, and it is also later in growing off in the spring.

Fifteen hundred and forty pounds of seed-cotton make 475 pounds of lint, which, when clean, rates as middling. Shipments are made to Atlanta by railroad or by wagons.

GWINNETT.

Population: 19,531.—White, 16,016; colored, 3,515.

Area: 470 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 96,582 acres.—Area planted in cotton, 27,549 acres; in corn, 36,568 acres; in wheat, 11,138 acres; in oats, 8,526 acres; in rye, 98 acres.

Cotton production: 11,810 bales; average cotton product per acre, 0.43 bale, 612 pounds seed-cotton, or 204 pounds cotton lint.

The surface of Gwinnett county is rolling, hilly, and in places somewhat broken. It is well timbered. The Atlantic and Gulf water-divide passes southwestward through the western part of the county near the Chattahoochee river, but with an ascent so gradual from the east as not to be perceptible, except on the north, where the county is hilly and broken, Hog mountain being the most prominent range of hills. The latter, with its unusual southeast trend, forms a sharp bend in the "divide" to the southeast. The summit of the mountain is narrow, with outcrops of itacolumite sandstone. A belt of deep red lands enters the county at the southern terminus of Hog mountain and passes through Lawrenceville southwest into De Kalb county. It has a width of several miles.

Across the lower part of the county, northeast and southwest, and to within $3\frac{1}{2}$ miles of Lawrenceville, is a belt of granite, a continuation of the Stone Mountain region, with "flat rocks" and rounded bowlders and a level country for the most part. Quartz crystals are abundant in localities along the granite belt, but with one terminal only complete.

Along the river there are some valley lands having a sandy loam soil, rich and very productive, but not very broad. Cotton on these lowlands runs too much to weed and is late; hence the uplands are preferred for that crop. The lowlands are devoted to corn.

The upland country along the river is very broken and hilly as far back as the "divide". Of the entire county 5 per cent. is said to be too broken for tillage.

The lands under cultivation comprise 32.1 per cent. of the county area. Of these, 28.5 per cent. is in cotton, with an average of 58.6 acres per square mile. In its cotton product per acre there are but seven counties in the state that rank above Gwinnett.

ABSTRACT FROM THE REPORT OF R. D. WINN, OF LAWRENCEVILLE.

The cotton lands of the county embrace the light gray sandy, the red clays on slopes and level places, and the chocolate or mulatto soils. The *gray sandy soils*, with their tough red-clay subsoils, cover two-thirds of the county, and have a growth of oaks of all species, hickory, chestnut, ash, beech, etc. They are well adapted to all crops that are produced in the county, viz, corn, wheat, oats, rye, cotton, sweet and Irish potatoes, pease, beans, tobacco, etc. But one-half of the cultivated land is devoted to cotton. The hillsides and slopes wash readily, doing serious damage to the uplands, but very little to the valleys, as the "settlings" are beneficial. One-fifth of the area originally under cultivation now lies out. When grown up in pines, after fifteen or twenty years, and reclaimed with fertilizers, the land yields as well as ever.

Fresh lands produce from 500 to 800 pounds of seed-cotton, or one-third this weight of lint, which rates as good middling. Cultivation for eight years reduces this to 300 or 400 pounds, with a slightly inferior staple, 1,425 pounds then making 475 pounds of lint. Crab-grass is most troublesome. The deep red clay land, after twenty years' cultivation, without fertilizers, yields from 600 to 800 pounds of seed-cotton per acre. Its growth is post and red oaks and pine.

Shipments are made mostly to Atlanta.

JACKSON.

Population: 16,297.—White, 11,139; colored, 5,158.

Area: 360 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 67,109 acres.—Area planted in cotton, 24,874 acres; in corn, 27,675 acres; in wheat, 7,485 acres; in oats, 7,355 acres; in rye, 34 acres.

Cotton production: 9,482 bales; average cotton product per acre, 0.38 bale, 543 pounds seed-cotton, or 181 pounds cotton lint.

The surface of Jackson county is rolling or undulating, with extensive level areas, and the entire county was at one time thickly timbered with post oak, pine, hickory, poplar, chestnut, etc.

A broad belt of red lands extends from Franklin county on the northeast through the center of this county to Jefferson county. Its width is from 8 to 10 miles, and the lands are mostly derived from hornblende rocks. Gray lands are found throughout the belt, and are the prominent feature of the northern and western parts of the county.

The entire county is considered tillable, the lands under cultivation comprising 29.1 per cent. of the county area. Corn has the greatest acreage, that of cotton averaging 60.1 acres per square mile, or 37.1 per cent. of the tilled lands.

ABSTRACT FROM THE REPORT OF E. M. THOMPSON, OF JEFFERSON.

The lands under cultivation may be classed as the red and gray uplands, the dark second-bottom lands of branches, creeks, and rivers, and the alluvial bottoms of Oconee river. The *uplands* are chiefly the cotton lands, as the crops of the lowlands are often caught by early frosts, and the stalk is inclined to run to weed. The soil is sandy and gravelly to a depth of 1 or 2 inches, and has a hard and dark red-clay subsoil impervious to water, which is easy to cultivate, and is early if well drained. The crops of the county are corn, cotton, wheat, oats, and potatoes, but three-fifths of the land is planted in cotton. Fresh lands yield from 300 to 500 pounds of seed-cotton per acre, rating as middling. Hog- and rag-weeds are most troublesome. One-fourth of the land now lies out, and by several years' rest it produces well when again cultivated. In some localities it is seriously damaged by washings, and the valleys are also sometimes injured to a small extent. Hillside ditching is resorted to by some to check the damage, and when properly done is successful.

COTTON PRODUCTION IN GEORGIA.

The *second bottoms* of the creeks and rivers cover about one-sixth of the county, and have a fine sandy clay loam soil 2 feet in depth and a dark red-clay subsoil or white pipe-clay. The growth is chestnut and gum. The soil is difficult to till in wet seasons, but easy in dry. Cotton comprises one-sixth of the crops on these bottoms, grows to a height of 4 feet, and yields from 800 to 1,000 pounds of seed-cotton. Cockleburrs and rag-weeds are most troublesome. Very little of this land now lies turned out.

The *bottom lands* on creeks and rivers have a growth of maple, poplar, walnut, and beech, and a clay loam soil 3 feet in depth, underlaid by a white pipe-clay. The soil is difficult to till, and only a very small percentage of cotton is planted on it, although it sometimes yields as much as 1,200 pounds of seed-cotton per acre the first year; but 600 or 800 pounds is the yield after the second year. The staple rates the very highest. Rag-weeds are most troublesome.

Shipments are made to Athens by wagon, and to Savannah by railroad.

MADISON.

Population: 7,978.—White, 5,392; colored, 2,586.

Area: 300 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 51,716 acres.—Area planted in cotton, 13,029 acres; in corn, 14,471 acres; in wheat, 6,168 acres; in oats, 4,631 acres; in rye, 28 acres.

Cotton production: 4,918 bales; average cotton product per acre, 0.38 bale, 537 pounds seed-cotton, or 179 pounds cotton lint.

The surface of Madison county is hilly and broken and well timbered. A north and south dividing ridge on the west throws nearly all of the waters eastward into the several forks of Broad river. The lands are nearly all gray or gravelly, with patches of mulatto here and there, and are derived mostly from gray biotite gneisses and mica-schists. Five per cent. of the county is said to be too hilly for cultivation, and 1 per cent. too swampy.

On the northwest, near the Banks county-line, is a belt of red lands from hornblende gneiss, and on the east occurs an exposure of soapstone rocks.

The bottom lands, while rich, are not very extensive, and are chiefly devoted to corn. The lands under cultivation comprise 26.9 per cent. of the county area. Of these lands, 25.2 per cent. are in cotton, its average being 43.4 acres per square mile. The average yield per acre is not as great as in some of the adjoining counties; it is, however, over the "third of a bale per acre" rule. Fertilizers are used extensively, and an instance of the results that might be expected from them when properly applied is shown.

In the experimental report of B. F. O'Kelley, of this county, both the red and the gray lands were used:

1. Dark red soil of a yellow, loose nature and clear of rocks; had been cleared for about fifty years and grown up in old-field pines; recleared in 1876 and planted in sorghum, corn, and wheat; no fertilizers used. Original growth, oak, hickory, dogwood, and pine. In 1879 it yielded without fertilizers 390 pounds of seed-cotton per acre; with 200 pounds of commercial fertilizers the yield was from 1,020 to 1,270 pounds per acre.
2. Light sandy soil with gray subsoil; cleared twenty years, and no fertilizers ever applied. Original growth same as No. 1. Yield 490 pounds of seed-cotton without fertilizers and 930 pounds with 200 pounds of fertilizers. The season of 1879 was dry.

ABSTRACT FROM THE REPORT OF R. M. MERONEY, OF DANIELSVILLE.

The lands of the county may be classed as gray sandy, comprising one-half of the area; mulatto, comprising one-fourth; and gray gravelly, nearly the same amount. The *gray sandy soils*, with gravelly gray subsoils at a depth of 2 inches, have a growth of pine, oaks, hickory, and black-jack. The soil is easily cultivated, is early, warm, and well drained, and is best adapted to cotton, which comprises about one-half of the crops. Cotton grows to a height of from 18 to 40 inches, and yields 600 or 700 pounds of seed-cotton per acre on fresh land. After five years' cultivation this yield is only from 200 to 400 pounds, 1,425 pounds from fresh and 1,485 pounds from old land making 475 pounds of middling lint. One-fourth of the soil now lies out, and when taken in again produces as well as ever for a few years, and when fertilized holds its own afterward. The lands are much injured by washing, and valleys are damaged 10 per cent. Some efforts have been made to check it.

The *red or mulatto lands* are considered the best for grain, though one-half of the crops consists of cotton. The sandy surface is only 1½ or 3 inches deep. The subsoil is gravelly and somewhat sandy, and the growth is pine, black, red, Spanish, black-jack, and post oaks, and hickory. These lands are inclined to bake hard in dry weather. Cotton grows from 2 to 4 feet high (most productive at 2½), and yields from 500 to 700 pounds of seed-cotton per acre on fresh land. The stalk runs to weed with deep cultivation, to prevent which topping and shallow cultivation are resorted to. After five years' cultivation the yield is only from 300 to 400 pounds, and, while the staple is about the same, a little more seed-cotton is required to make 475 pounds of lint. The crops are troubled most with hog-weed and crab-grass. About one-fourth of this land now lies out.

The *gravelly soils*, with coarse gravelly subsoils at 2 inches depth, comprise about one-fourth of the lands of this county, and are not considered well adapted to anything. Very little cotton is planted on them, as its yield is only from 150 to 200 pounds of seed-cotton per acre, and the stalk grows to a height of only 10 or 15 inches on fresh land. Five years' cultivation reduces this yield to 50 or 100 pounds of seed-cotton per acre. The crop is much troubled with poverty-weed and crab-grass. One-half of this land now lies out, and is worthless afterward. It washes badly, and no efforts have been made to reclaim it.

This latitude is rather too high for cotton cultivation, and the seasons are rather short. Cotton is frequently killed in the spring or injured in the fall by frost. In the latter case a yellow cotton is produced, and occasionally the bolls are prevented from opening.

Shipments of cotton are made to Athens at \$1 per bale.

ELBERT.

Population: 12,957.—White, 6,085; colored, 6,872.

Area: 440 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 79,406 acres.—Area planted in cotton, 25,833 acres; in corn, 20,369 acres; in wheat, 7,688 acres; in oats, 5,552 acres; in rye, 50 acres.

Cotton production: 8,826 bales; average cotton product per acre, 0.34 bale, 486 pounds seed-cotton, or 162 pounds cotton lint.

Elbert county lies along the Savannah river, and is bordered by Broad river on the west and south. Its surface is mostly rolling and somewhat hilly, and is well timbered with oak, hickory, and pine. It is covered chiefly with gray sandy and gravelly soils, underlaid by clays, derived from granites and gneisses. Areas of red lands occur throughout the county. The granite around Elberton is a fine-grained siliceous rock with small particles of biotite mica, but not in sufficient quantity to form red lands. These gray sandy granite lands extend 5 miles south of Elberton to a narrow strip of red clay derived from hornblendic material. South of this is a flatwoods belt, from 5 to 7 miles in width, which extends from the Savannah river (north of the mouth of Broad river) in a westerly course into Oglethorpe county. Professor D. C. Barrow says of this belt:

The surface is broad and level, with ponds of water and a growth of stunted black-jack oaks. The land is a dark pipe-clay kind of soil with coarse gravel in places, and is almost useless for agricultural purposes; in wet weather very boggy, and in dry as hard as a brick. It seems to have been at one time a long marshy and boggy slough. The underlying material is a kind of siliceous and rough clay-stone, with seams of angular quartz.

The sandy and red lands are similar in character to other lands of the region. (See regional description, page 36.) The bottom lands of the rivers cover but a small area. It is estimated that 65 per cent. of the county is cleared land. Tilled lands comprise 28.2 per cent. of the total area, the population averaging 29 persons per square mile. Cotton is the chief crop, its acreage being 58.7 acres per square mile, or 32.5 per cent. of the lands under cultivation.

The following experiments have been reported to the state department of agriculture:

EUGENE B. HEARD, of Elberton: Fresh land, soil dark; subsoil, yellow clay. Growth, hickory, post oak, and second growth of pine. Without fertilizers the yield was about 600 pounds of seed-cotton per acre; with 200 pounds commercial fertilizers the yield on four plats ranged from 1,050 to 1,230 pounds.

A. F. SMITH, of Coldwater: Old land, soil gray and gravelly, with yellow subsoil. Original growth, pine, oak, and hickory. Was turned out twelve years before as exhausted upland, and was covered with broom-sedge; never fertilized. The season of 1879 was poor, and a large portion of the crop did not mature. Without fertilizers, the average yield was 70 pounds of seed-cotton; with 100 pounds, the yield was about 297; with 200 pounds, about 355 pounds of seed-cotton per acre.

ABSTRACT FROM THE REPORT OF ROBERT HESTER, OF ELBERTON.

Cotton, which comprises one-half of the crops of the county, is confined to the *gray sandy lands*, which are early, warm, well drained, easy to till, and best adapted to its growth. The stalk reaches an average height of 3 feet, and topping is done to prevent its running to weed in wet weather and to favor bolling. Crab-grass is the most troublesome. The uplands wash readily, and injury is done to them and to the valleys to the extent of 25 per cent. One-half of the area formerly under cultivation now lies out; after resting it yields very well, but wears out again in three-fourths of the time. It is estimated that three acres will on an average produce a bale of 450 pounds. The staple rates as middling. The gray lands cover three-fourths of the county area.

Shipments of cotton are made, as soon as baled, to Charleston, Baltimore, and New York, by rail.

OGLETHORPE.

Population: 15,400.—White, 5,469; colored, 9,931.

Area: 510 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 92,772 acres.—Area planted in cotton, 35,306 acres; in corn, 22,019 acres; in wheat, 7,184 acres; in oats, 6,310 acres; in rye, 19 acres.

Cotton production: 12,336 bales; average cotton product per acre, 0.35 bale, 498 pounds seed-cotton, or 166 pounds cotton lint.

The surface of Oglethorpe county is rolling and broken, resembling in its general features the adjoining counties. The greater part is drained into the Savannah river, the divide between it and the Oconee river lying in the western part of the county; on the south another dividing ridge gives to the Ogeechee river some of the drainage water. In the middle of the county there is a granitic ridge, extending in a slight northeasterly course into Elbert county and dividing the tributaries of Broad river into two groups—those on the north flowing directly into Broad river, the rest emptying first into Long creek, and thence northeast into Broad river.

The granites extend south to Long creek and southwest into the upper part of Greene county, the hills becoming lower, though the country is very broken.

In the southeastern part of the county the black-jack flatwoods pass in a southward course to the red belt just south of Woodstock. It has here a width of 3 or 4 miles, and the lands are more sandy than in Elbert county, producing cotton for a few years only. (See description in Wilkes county, p. 102.) On the north of the granites the red lands cover the rest of the county, with mixtures of gray sandy areas. (See analysis of land, page 36.)

The soils of the granitic area are gray, gravelly, and sandy, with red mulatto lands intermixed. Quartz crystals are found in abundance in various sections, and include some large and beautiful amethysts. Of the county area 3 per cent. is too broken for cultivation. The crops are corn, cotton, wheat, oats, and potatoes, and 28.4 per cent. of the county area is under cultivation. Cotton is the chief crop, its acreage comprising 38.1 per cent. of the tilled lands, and averaging 69.2 acres per square mile.

ABSTRACT FROM THE REPORT OF WILLIAM L. JOHNSON, OF STEPHENS.

The uplands of the county vary from sandy to red stiff mulatto and black-jack soils in large areas. Cotton on the lowlands is liable to be late and prematurely frost-killed; hence the uplands are preferred when the soil is fair.

The *sandy uplands*, lying mostly level in fields of from 10 to 20 acres, comprise one-half of the tillable lands of the county. The growth is oak, pine, ash, gum, and hickory. The soil has a depth of 8 inches or more, with a tough yellow clay subsoil, which becomes cloddy at first, but changes in a short time by cultivation to the color of the soil. It contains coarse gravel and sometimes pebbles, and is underlaid by a very stiff clay. The soil is early when well drained, and is easy to till. Cotton, which comprises one-half the crops, grows to a height

of 3 feet, and yields from 800 to 1,000 pounds of seed-cotton per acre. Crab-grass gives the most trouble to cotton crops; weeds follow grain crops. Lands turned out thirty years ago and cleared now do better in cotton for three years than the original forest lands. These uplands are much injured by washing and gullying, and the valleys are often greatly injured. Horizontalizing and hillside ditching are very successful in checking the damage.

The *red uplands*, comprising one-third of the lands of the county, have the same growth as the gray sandy, and are usually rolling and hilly. The soil is a red or mixed clay loam, 10 inches in depth, with a tough yellow-clay subsoil, which pulverizes quickly and changes color on being exposed. It is early when well drained, rather difficult to till, and is best adapted to grain, though cotton comprises one-half the crops. Cotton grows to a greater height on this land than on the gray sandy, and runs to weed in wet weather unless fertilizers are used, which prevent it and favor bolling. In other respects it resembles the gray sandy. In some localities a great deal of this land lies turned out, and when reclaimed it does not produce as well as the sandy lands. The uplands wash readily, causing serious injury to the valleys.

The *bottom lands* differ in character, some being stiff and others a dark sandy loam. The soils are about 2 feet deep, and are underlaid by a stiff pipe-clay or gravel. They are hard and cloddy in dry seasons, and are best adapted to corn. They are more or less liable to overflow, and but little cotton is planted on them. The plant grows usually 5 or 6 feet high, and runs to weed when the rows are close together, or in wet weather. The yield is from 1,000 to 1,500 pounds of seed-cotton per acre.

Shipments are made to Augusta, by railroad, at \$2 per bale.

CLARKE.

Population: 11,702.—White, 5,313; colored, 6,389.

Area: 180 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 23,337 acres.—Area planted in cotton, 8,020 acres; in corn, 7,394 acres; in wheat, 1,387 acres; in oats, 1,755 acres; in rye, 36 acres.

Cotton production: 3,310 bales; average cotton product per acre, 0.41 bale, 588 pounds seed-cotton, or 196 pounds cotton lint.

Through the middle and western sections of Clarke county flow the several forks of the Oconee river, separated on the east from the tributaries of the Broad river by a low ridge running north and south, which is also a part of the main Oconee and Savannah water-divide. The surface of the county is very hilly and broken, being deeply cut by the various streams. The county was once heavily timbered, but it has been estimated that 78 per cent. of the original forest has been removed. The lands of the county present the usual variety of the red clay and gray sandy soils, more or less gravelly, that are found over the entire metamorphic region, and are underlaid by clay subsoils. They occur very much intermixed, but, as in other counties, there are large areas in which one is predominant.

There are two belts of red (hornblendic) lands that extend across the county, and another red area covers the southern portion. Otherwise the lands are chiefly gray and sandy. They are described in the accompanying abstract. (See also analysis on page 33.) The bottom lands are very narrow, the uplands often approaching to the water's edge and forming high bluffs.

A little more than one-fifth (20.3 per cent.) of the county area is under cultivation. Cotton is the chief crop, its acreage comprising 34.4 per cent. of tilled land and averaging 44.6 acres per square mile. The product per acre is comparatively high. Athens is the chief market for the county.

The following experiment was reported to the department of agriculture by Thomas W. Gean, of Athens:

Soil thin, with red-clay subsoil; has been cleared fifty years; part of the time an old field. Original growth, post oak, chestnut, and short-leaf pine. No manures previously used. Yield, without fertilizers, about 425 pounds of seed-cotton per acre. With over 200 pounds of fertilizers the yield varied from 989 to 1,130 pounds per acre.

EXPERIMENTAL FARM OF THE UNIVERSITY OF GEORGIA.—Thin gray soil, with red-clay subsoil; not cultivated for thirty years. Original growth, pine and oak. Yield of non-fertilized rows averages 294 pounds; with 200 pounds of various fertilizers the yield varies from 534 to 1,193 pounds of seed-cotton per acre.

ABSTRACT FROM THE REPORT OF PROFESSOR D. C. BARROW, JR., OF THE UNIVERSITY OF GEORGIA, ATHENS.

The lands may be classed as red clays, gray sandy, mulatto, and alluvial bottom soils. The *red clay lands* cover about 65 per cent. of the county area, and extend chiefly in two belts across the county, each about 6 miles wide. The dark red soil has a depth of about 18 inches, with a tough red-clay subsoil, which is excellent for bricks. The soil is fine grained and compact, retaining moisture for a long time, having little sand in its composition. It is very durable, resisting both weathering influences and the taking up of its riches by the plants, and produces crops for a number of years with very little decrease in yield. Its growth is red, Spanish, black, and white oaks, chestnut, pine, hickory, dogwood, and some walnut. The soil is cold and naturally well drained, and is tolerably easy to till in wet seasons. It is best adapted to corn, clover, and wheat, though cotton forms 60 per cent. of the crops. Fresh lands produce from 900 to 1,000 pounds of seed-cotton, and this yield continues for a number of years without any apparent diminution. About 1,545 pounds of seed-cotton are required to make 475 pounds of lint, the staple rating as good middling. The lands are not troubled so much by weeds as by crab-grass. They also have a tendency to wash, and on steep hillsides are much damaged; the valleys are also injured by these washings, especially on small streams. Hillside ditching is practiced with good success in checking the damage.

The *gray sandy lands*, which form a belt 3 miles wide in the middle of the county, comprise 30 per cent. of the lands. The soil is gray and more or less sandy, 16 inches deep, and is underlaid by light yellowish or reddish clay, much less tough than that of the red lands and much less retentive of moisture. It is not as durable as the red lands, is generous in giving up its plant-food, and is more readily washed off by rains than is the red. It also decreases in productiveness more readily. The growth is white, red, Spanish, and post oaks, hickory, pine, and chestnut, this last being more abundant than on red lands. Whenever it is possible, farmers use chestnut rails for fencing purposes, and gray lands are often marked by chestnut fences. These lands are best adapted to cotton and oats, 75 per cent. of the former being planted. The yield is from 1,000 to 1,200 pounds of seed-cotton per acre. While the soil is not so durable as the red land, it recuperates more readily and produces very well for a few years after a rest.

The *bottom lands*, comprising 5 per cent. of the lands of the county, are variable in width, and are never very wide. The growth is birch, hickory, pine, oak, walnut, and frequently considerable white oak. The soil is a dark alluvial loam, sometimes underlaid by a tough pipe-clay, white or bluish in color. The land is best adapted to corn, 10 per cent. only of cotton being planted. Cocklebur and rag-weeds are most troublesome.

OCONEE.

Population: 6,351.—White, 3,327; colored, 3,024.

Area: 160 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 34,223 acres.—Area planted in cotton, 12,303 acres; in corn, 9,930 acres; in wheat, 2,136 acres; in oats, 2,215 acres; in rye, 29 acres.

Cotton production: 4,257 bales; average cotton product per acre, 0.35 bale, 492 pounds seed-cotton, or 164 pounds cotton lint.

Oconee county embraces a long and narrow area between Barber creek and the Oconee river on one side and the Appalachian river on the west. The surface is hilly. A high dividing ridge passes longitudinally through the county, the streams flowing in either direction being very short.

The southern portion of the county is covered with gray sandy lands, which extend to within 3 miles of Watkinsville, on the Union Point road; the rocks are micaceous in character, with garnets and feldspar.

The red lands form a belt across the county from the upper portion of Clarke southward into Morgan county. Watkinsville lies within this belt, the lands extending $1\frac{1}{2}$ miles west and 3 miles south. Hornblende gneiss forms the prominent rock on the eastern and biotite gneiss on the western half of the belt. Gray lands cover the extreme northwestern section.

The subsoils of all of the lands are mostly yellow and red clays. The character of the soils and methods of cotton culture are similar to those of Clarke county. The timber growth is chiefly red and post oaks, hickory, and short-leaf pine, and it is estimated that 58 per cent. of the growth has been cut away. One-third of the county area is under cultivation, and of this 36 per cent. is in cotton, the chief crop averaging 76.9 acres per square mile. The average product per acre is much less than that of Clarke county, though greater than for the region or state at large.

Shipments are made by wagons to Athens, where most of the cotton is sold.

WALTON.

Population: 15,622.—White, 9,321; colored, 6,301.

Area: 400 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 82,628 acres.—Area planted in cotton, 31,797 acres; in corn, 26,769 acres; in wheat, 9,418 acres; in oats, 6,454; in rye, 97 acres.

Cotton production: 12,534 bales; average cotton product per acre, 0.39 bale, 561 pounds seed-cotton, or 187 pounds cotton lint.

Walton county is largely covered with red clay and mulatto lands. This is especially the case in the middle of the county, where the belt is very wide and extends in every direction from Monroe.

Narrow areas of gray sandy lands are found on both sides of this red section, and in the extreme west appear the granites of the large central region. The difference between the gray sandy and the granitic lands is so slight that they might very well be classed together. The gneisses also are granitic in character, and black mica enters largely into the composition of both. The subsoils are very generally the usual red and yellow clays of the metamorphic region.

The surface of the country is hilly and broken, $1\frac{1}{2}$ per cent. being too much so for successful tillage. There are two prominent and isolated points in the county, viz, Alcova and Jack's mountains, the former having an elevation of 1,088 feet above the sea, or about 200 feet above Social Circle. They are formed of sandstone or quartzites, and have rounded summits.

Thirteen per cent. of the county area is reported to be of irreclaimable swamp. Over half of the original timber has been cleared away. The lands under cultivation embrace 32.3 per cent. of the county area. Cotton is the chief crop, its acreage having an average of 79.5 acres per square mile, or 38.5 per cent. of the tilled lands. In product per acre the county ranks well among the counties of the state.

ABSTRACT FROM THE REPORT OF R. H. CANNON, OF WALNUT GROVE.

The uplands alone are planted in cotton, and may be classed as light gray and red lands. The *gray sandy lands* cover about 80 per cent. of the county, and have a growth of pine, oak, hickory, chestnut, and dogwood. The soil is $3\frac{1}{4}$ inches deep; the subsoil is a buff-colored clay, unproductive when not mixed with the soils. The crops of the county are cotton, corn, wheat, potatoes, and oats. Cotton comprises half of these crops, and yields 600 pounds in the seed per acre on fresh gray lands. Cultivation of five years reduces the yield to 450 pounds, and 1,545 pounds make 475 of lint, which is hardly as good as that from fresh land. Cotton grows from 30 to 45 inches high, and is most troubled by rag-weeds. One-half the land now lies turned out, and, if not washed, is, after resting, as good as the original. Hillside ditching and horizontalizing prevent this washing, but some of the uplands are already much injured. The valleys do not suffer.

The *red lands* comprise 20 per cent. of the tillable lands, and have a growth of pine, oak, hickory, chestnut, dogwood, and gum. The subsoil of these lands is hard and stiff, and is inclined to bake when exposed to the sun. Cotton comprises half the crops, grows 36 to 50 inches high, and yields as on the sandy lands.

Cotton was first planted in this county about the year 1820, but for several years was raised only in limited quantity. About the year 1830 the area devoted to cotton began to increase, and has continued to increase ever since, the largest crop being that of the present year. Commercial fertilizers were first used here in 1866.

Cotton is sold to local buyers at the nearest railroad station, and thence it is shipped to Augusta, Atlanta, or Savannah.

ROCKDALE.

Population: 6,838.—White, 4,149; colored, 2,689.

Area: 120 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 33,529 acres.—Area planted in cotton, 14,448 acres; in corn, 9,951 acres; in wheat, 3,268 acres; in oats, 2,401 acres; in rye, 25 acres.

Cotton production: 4,385 bales; average cotton product per acre, 0.30 bale, 432 pounds seed-cotton, or 144 pounds cotton lint.

Rockdale is covered almost entirely by granite rocks (in bowlders or flat rock) and granitic soils (see general part, page 35). In the extreme eastern part gray sandy soils, derived from gneisses, generally prevail.

The surface of the county is rolling and broken, with an elevation of a little over 900 feet above the sea. It is estimated that at least 4½ per cent. of the lands are too rocky for cultivation, and that 65 per cent. of what was once well timbered have already been cleared.

The crops of the county are cotton, corn, wheat, oats, rye, pease, and potatoes, with fruits, viz, peaches, apples, pears, grapes, etc. Tilled lands comprise 43.7 per cent. of the county area. Cotton has by far the greatest acreage, its average being 120.4 acres per square mile, or 43.1 per cent. of the tilled land. In the former regard it ranks as sixth in the state, but in percentage of tilled land many counties are above it. Its product per acre is low.

ABSTRACT FROM THE REPORT OF W. L. PEEK, OF CONYERS.

The soils may be classed as sandy, with red subsoil; red, with stiff clay subsoil; and sandy, with yellow sandy subsoil. The *gray sandy soils*, with red subsoils, cover half of the county, and are the chief cotton lands. They extend 40 miles east and west and 15 north and south, and have a growth of hickory, red and post oak, pine, and chestnut. The soil is only from 1 inch to 3 inches deep, and is underlaid by rock at from 1 foot to 2 feet. Twenty per cent. of the lands once under cultivation now lie out. They wash readily, doing serious damage occasionally. Cotton grows to a height of one-half to 3 feet, yielding on fresh land from 500 to 1,000 pounds of seed-cotton per acre, the lint rating as middling. Cultivation of ten years reduces this yield to 300 or 400 pounds, the staple remaining about the same. Crab-grass is most troublesome.

Cotton comprises one-half the crops, and shipments are made by railroad to Augusta at 75 cents per bale, and to Atlanta at 50 cents.

CLAYTON.

Population: 8,027.—White, 4,938; colored, 3,089.

Area: 140 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 39,995 acres.—Area planted in cotton, 17,422 acres; in corn, 11,458 acres; in wheat, 3,849 acres; in oats, 3,496 acres; in rye, 24 acres.

Cotton production: 6,606 bales; average cotton product per acre, 0.38 bale, 540 pounds seed-cotton, or 180 pounds cotton lint.

Clayton county is almost entirely included in the central granite area. The Atlantic and Gulf water-divide passes southward through it, the Central railroad marking its summit, which otherwise is not prominent.

The northern part of the county is undulating and hilly, the summits of the ridges being rounded or often flat, in many places furnishing areas of almost level lands, well suited for farms. The lower portion of the county is not so hilly. The streams have low banks and narrow, sandy bottom lands. The soils are mostly the usual gray sandy or gravelly, peculiar to the granites (see general part, page 35).

One per cent. of the area of the county is said to be too broken and the same proportion too swampy for tillage. The character of the soil and growth and methods of culture are similar to those of adjoining granitic counties.

A large proportion of the original timber growth has been removed. Lands under cultivation embrace 44.6 per cent. of the county area, cotton being the chief crop, its acreage averaging 124.4 acres per square mile, or 43.6 per cent. of the tilled lands. In the former regard it is surpassed only by the counties of Pike, Troup, and Houston. Cotton is shipped by railroad either to Atlanta, Macon, or Savannah.

The experiment with fertilizers, by J. M. Hull, of Jonesboro', on sandy lands that had been under cultivation for fifteen years and partially manured, gave the following results:

The yield without fresh application of fertilizers was about an average of 800 pounds per acre of seed-cotton. With fertilizers the yield varied from 950 to 1,120 pounds in twenty-five experiments with different fertilizers. The season was unfavorable for cotton. With corn, the application of fertilizers increased the yield from 13 to 18 bushels.

CAMPBELL.

Population: 9,970.—White, 6,085; colored, 3,885.

Area: 240 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 61,411 acres.—Area planted in cotton, 21,448 acres; in corn, 14,056 acres; in wheat, 5,774 acres; in oats, 5,269 acres; in rye, 31 acres.

Cotton production: 8,986 bales; average cotton product per acre, 0.42 bale, 597 pounds seed-cotton, or 199 pounds cotton lint.

The surface of Campbell county is rolling, broken, and hilly, and is well timbered. The Chattahoochee river forms its northern boundary, receiving the drainage from a large portion of the county. On the southeast the streams are tributary to Flint river.

Granitic lands cover the largest part of the county in two separate areas, which, however, unite on the north. The largest of these covers that part of the county lying east of the Atlanta and West Point railroad, and forms a

portion of the large central granite region of the state. The country is high and rolling, with some broad and level tracts, the rock appearing both as outlying boulders and as "flat rock". The latter is seen at Palmetto, where it forms for a short distance the bed of the railroad. Both the black and light varieties of mica enter into the rock composition, and red lands are found occasionally, though the soils are generally gray and sandy.

The other granite area forms a narrow belt near to and parallel with the Chattahoochee river, and on the southeast side of it is a strip of itacolumite sandstone with mica-schists, which form the ridge on which Campbellton is situated.

The granite appears in large boulders, and these on the southwest are very numerous and "weather" slowly. Between the two granite outcrops or sections there is a region of country broken and hilly, with broad level areas, and having gray, mulatto, and red lands, the latter forming a belt which extends southwestward into Coweta county. Some trap-rocks are found a short distance west of Palmetto. This central portion is comparatively thinly settled. Within the bends of the Chattahoochee river there are large tracts of alluvial lands, level, highly productive, and nearly, if not quite, all in cultivation. Forty per cent. of the county area is under tillage, the chief crops being cotton, corn, oats, and some wheat. Cotton has the largest acreage, comprising 34.9 per cent. of the tilled lands, and averaging 89.4 acres per square mile. Its yield per acre is high, the county ranking as eleventh in the state.

Shipments are chiefly made to Atlanta.

DOUGLAS.

Population: 6,934.—White, 5,463; colored, 1,471.

Area: 190 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 29,330 acres.—Area planted in cotton, 9,520 acres; in corn, 10,586 acres; in wheat, 3,521 acres; in oats, 3,189 acres.

Cotton production: 4,099 bales; average cotton product per acre, 0.43 bale, 615 pounds seed-cotton, or 205 pounds cotton lint.

The surface of Douglas county is hilly and broken, and 10 per cent. is thought to be too much so for successful tillage. The drainage is all to the Chattahoochee river, which forms the southern boundary. There are two belts of granite extending across the county in an easterly course. One of these, in the northern part, forms a low ridge, on which Douglasville, the county-seat, is situated, and extends from Pine mountain, near Villa Rica on the west, to Salt Springs on the east, where it passes northward into Cobb county. The soil of this ridge is gray gravelly and sandy, and, owing to its narrow and rocky area, is not very much under cultivation. On the north of this belt the red clay lands predominate, derived from decomposed hornblende material. Some of the lands have a thin sandy soil over the red clays.

The other narrow granitic belt lies in the middle of the county from Crawfish creek eastward, and is characterized by a level country and a growth of long-leaf pine. The soil is gray sandy and rocky. Between these granite belts the country is rolling and the lands are mostly red or mulatto-colored clays, with frequently a thin sandy soil.

South of the middle granite belt the country is at first but slightly hilly, but near the river it becomes very broken and rough, with high hills facing the river valley. The soil is very gravelly, from the innumerable small quartz veins that exist in the underlying and outcropping gneisses. Garnets enter largely into the composition of these rocks in localities. (See analysis, page 33.)

The river valleys are in this county wide and very fertile, and are largely devoted to cotton culture. But 24.1 per cent. of the county area is under cultivation, the acreage of corn being greater than that of any other crop. Cotton has an average of 50.1 acres per square mile, and embraces 32.5 per cent. of the tilled land. In its cotton product per acre the county ranks with Fulton and Gwinnett, or as seventh in the state.

ABSTRACTS FROM THE REPORTS OF J. E. HENLEY, M. D., OF CAMPBELLTON, AND F. M. DUNCAN, OF DOUGLASVILLE.

Cotton comprises nearly one-half the crops of the uplands. A cold and wet spring usually occurs, which is injurious to the cotton-plant, and, if followed by a dry summer and wet fall, results in a total failure of the crops.

The gray lands of the uplands cover three-fifths of the county, and have a growth of oak, hickory, chestnut, black-jack, and pine. They yield from 700 to 1,000 pounds of seed-cotton per acre when fresh, or 400 pounds after ten years' cultivation. The staple rates as low middling, but from old lands is shorter and finer than at first; 1,545 pounds make 475 pounds of lint. The height of the stalk is from 3 to 5 feet, running to weed in wet places. The liberal application of fertilizers prevents this tendency.

The red and mulatto lands differ from the gray in having sometimes walnut and but little pine. They are best adapted to wheat, though producing cotton as well as the gray lands. Hog- and rag-weeds and crab-grass are very troublesome on all the uplands. About 10 per cent. of lands once cleared now lie turned out.

The river valleys are in many places in this county quite wide and rich, and furnish the county with a large part of its cultivated lands. The growth is sweet gum, white and red oak, hickory, walnut, poplar, elm, maple, etc. The soil is a dark, fine sandy loam, 10 inches in depth, over a red clay. It is best adapted to cotton, which comprises one-half of the crops, grows to a height of from 3 to 5 feet, and yields 1,000 pounds of seed-cotton per acre when fresh and 800 after twenty years' cultivation, 1,720 pounds of seed-cotton making 475 pounds of lint. The crops are most troubled with rag-weeds, and especially crab-grass. To prevent these bottom crops from running to weed commercial fertilizers are used. One-tenth of the lands now lies turned out, being much benefited by rest.

Shipments are made about the 1st of December to Atlanta, by rail, at \$1 per bale.

CARROLL.

Population: 16,901.—White, 14,591; colored, 2,310.

Area: 540 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 85,683 acres.—Area planted in cotton, 22,593 acres; in corn, 28,964 acres; in wheat, 10,414 acres; in oats, 7,729 acres; in rye, 134 acres.

Cotton production: 9,300 bales; average cotton product per acre, 0.41 bale, 588 pounds seed-cotton, or 196 pounds cotton lint.

Carroll county has a rolling surface, and is covered very generally with gray sandy and gravelly soils. Quartz fragments, some quite large, are found in various sections, and common garnets from the size of a pea to an inch or two in diameter are often associated with the gneisses.

Red lands from hornblende occur in small and large areas over the county, but the most prominent are on the Tallapoosa river, northwest of Carrollton, and along the county-line on the north. The county is well timbered throughout with oak, hickory, short-leaf pine, etc., and 24.8 per cent. of its area is under cultivation. The county properly belongs to the chief gold belt of the state, and several mines are worked. Copper ores also exist. Corn is the chief crop of the county, while cotton comprises 26.4 per cent. of the tilled area, and averages 41.8 acres per square mile. In average product per acre it ranks as seventeenth. The following experiment was reported to the state department of agriculture by G. A. McDaniel:

The yield of freshly-cleared *gray sandy land* without fertilizers is 300 pounds per acre; the same with 200 pounds of commercial fertilizers, 800 pounds of seed-cotton per acre. On land nine years in cultivation and previously fertilized the yield was 860 pounds per acre; the same with a fresh application of 200 pounds gave a yield of from 1,067 to 1,330 pounds of seed-cotton per acre. Red lands that had been twenty-five years in cultivation and partly manured gave a yield of 800 pounds. The application of 250 pounds fertilizers produced a yield of 1,200 pounds per acre.

ABSTRACT FROM THE REPORT OF R. H. SPRINGER, OF WHITESBURG.

The uplands vary greatly in character, from good to those worthless except for timber. They are preferred to the bottom lands, which are late in their crops. Three varieties or classes of soils are distinguished. The *light sandy uplands*, with pine, oak, and hickory growth, and a depth of 6 inches to a red or yellow or clay subsoil, is early, warm, well drained, easy to till, and is best adapted to cotton, which comprises about 50 per cent. of the crops. It yields when fresh about 600 pounds of seed-cotton per acre, or 200 pounds of lint, rating as first-class low middling. Ten years reduces this yield to 250 pounds of seed-cotton and the staple to "ordinary", 1,545 pounds being required to make 475 pounds of lint. The plant runs to weed with too much rain, heavy fertilizing being the remedy. Crab-grass and rag-weeds are most troublesome on this land. Horizontalizing is used, with only partial success, in preventing the clay washings from hillsides, which cover up and impoverish the valleys.

The *red lands*, with their heavy red-clay subsoils and growth similar to that of the gray lands, are early, warm, and easy to till. Cotton, which comprises one-third of the crops, grows to a height of 2 feet, and yields, when the land is fresh, 700 pounds of seed-cotton per acre, 1,485 pounds making 475 pounds of lint. The land rapidly deteriorates, and in ten years the product is only about 200 pounds of seed-cotton, 1,545 pounds being required for 475 pounds of lint.

The *bottom lands*, 6 inches deep, with red and yellow clay subsoils, are also devoted largely to cotton, which grows 4 feet high and yields 800 pounds of seed-cotton per acre on fresh land, the lint rating as first class. These lands also rapidly fail, and in ten years the yield is only 300 pounds, and its lint rates second class.

Shipments of cotton are made, by railroad, to Newnan, and thence to Atlanta and other points.

HEARD.

Population: 8,769.—White, 5,674; colored, 3,095.

Area: 290 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 47,761 acres.—Area planted in cotton, 17,348 acres; in corn, 17,209 acres; in wheat, 4,900 acres; in oats, 3,092 acres; in rye, 40 acres.

Cotton production: 5,900 bales; average cotton product per acre, 0.34 bale, 486 pounds seed-cotton, or 162 pounds cotton lint.

The Chattahoochee river divides Heard county into two sections. On the east side there is a granite belt or ridge from 150 to 200 feet above the river, which crosses it below Franklin and extends into Alabama. The rest of the county on the east and southeast is rolling and broken, the ridges being broad and flat, with granites and gray gneisses, which form gray sandy and gravelly soils, and have a growth of oaks, hickory, and chestnut on the uplands, and beech, maple, poplar, and sweet and black gums along the streams.

The country west of the river is rugged and mountainous, rising toward the northwest to an elevation of 600 feet above the river. This northwestern portion is extremely broken and hilly and rather thinly settled. Black Jack ridge crosses the corner of the county from Carroll county into Alabama.

The "Backbone" ridge lies to the west, having in its formation itacolumite sandstone and magnesian rocks; but to the northwest the formation is chiefly composed of mica-schists and gray gneisses full of small quartz veins, forming soils mostly gray, with the usual associated red clays and sands in patches and narrow belts. These lands extend southward over the rest of the county, which is much more level. The growth of this western section is tall long-leaf pine, scrub oak, and hickory, and on uplands some small areas have oak, hickory, and chestnut exclusively. On the banks of the streams are poplars, gum, ironwood, laurel, and wild cucumber trees.

About 2 per cent. of the county area is said to be too broken for tillage, and the same amount is of irreclaimable swamp. The lands under cultivation comprise 25.7 per cent. of the county area. Cotton and corn have nearly the same acreage, the former having an average of 59.8 acres per square mile, or 36.3 per cent. of the tilled lands.

The effect of judicious fertilization on both gray and red lands is shown in the following experiments by J. C. Brewer, of Antioch, on three plats of land:

1. Gray sandy soil, red-clay subsoil, cultivated six years; no manure previously used. Original growth, pine, hickory, post oak, and red oak. Yield without fertilizers, 630 pounds of seed-cotton per acre; yield with fertilizers, from 910 to 1,111 pounds of seed-cotton.

2. Soil and growth same as No. 1; has been but slightly manured previously, and has been in cultivation fifty years. Yield, about 600 pounds per acre; when freshly fertilized, from 910 to 1,137 pounds of seed-cotton per acre.

3. Stiff red clay soil; original growth, oak, hickory, poplar, and black gum. Cleared in 1874, and well fertilized each year. Yield, 1,500 pounds per acre; yield with fresh fertilizers, from 1,610 to 1,977 pounds of seed-cotton.

In this last plat the effect of yearly fertilization is shown by the large yield without fresh applications. These results were corroborated in the next year by a still greater yield.

ABSTRACT FROM THE REPORT OF R. H. JACKSON, OF FRANKLIN.

The *gray sandy lands* of the county are the ones chiefly devoted to cotton. The gray soils of the river bottoms are also very rich, have a depth of 36 inches, and produce cotton very well. The gray lands of the uplands have a depth of from 2 to 8 inches, with a red or yellow subsoil. The soil is easily tilled, and produces good crops of cotton, corn, wheat, and oats, but is best adapted to cotton. This grows to a height of 48 inches, producing from 800 to 1,000 pounds of seed-cotton per acre, the lint rating as good ordinary. After a few years' cultivation the yield is diminished from 300 to 600 pounds, or, if manured, from 500 to 1,000 pounds per acre, and 1,660 pounds are required to make 475 pounds of lint. Rag-weeds and crab-grass are most troublesome to these crops. One-twentieth of the land now lies out, due probably to the washing and gullying to which the soil is very subject. The valleys are not much injured. Hillside ditching, when well done, is successful in checking the damage.

Cotton, when baled, is hauled to La Grange in wagons, and there sold to merchants.

COWETA.

Population: 21,109.—White, 9,305; colored, 11,804.

Area: 440 square miles—Woodland, all; metamorphic, all.

Tilled lands: 116,956 acres.—Area planted in cotton, 48,494 acres; in corn, 28,980 acres; in wheat, 9,392 acres;

in oats, 10,385 acres; in rye, 76 acres.

Cotton production: 16,282 bales; average cotton product per acre, 0.34 bale, 477 pounds seed-cotton, or 159 pounds cotton lint.

The general elevation of Coweta county is about 975 feet. Its surface is hilly and broken on the east and west, and higher, though quite level in the central portion—the water-divide. The lands embrace belts of gray and red soils underlaid by clay subsoils. The small streams are tributary in part to the Chattahoochee river on the west and in part to the Flint on the east.

On the west and northwest is a large area of feldspathic granites—a very broken and hilly country having a gray sandy and gritty soil with quartz gravel. On the east of this the country is more level, with a belt of gneisses 5 miles in width, also giving a gray sandy soil, intermixed with some red lands, from associated mica-schists and hornblende rocks. Between this belt and Newnan on the east, a distance of 8 or 10 miles, are two belts of red hornblende clay lands, extending a little east of north into Campbell county and southward into the northwestern corner of Meriwether county. But little quartz is found in these belts, and between the belts are found the gray feldspathic soils. East of Newnan to Sharpsburg are chiefly red soils, derived from hornblende rocks and mica-schists, but east to the county-line the lands are chiefly gray, with outcrops of feldspathic gneisses and some granite. These latter soils are characteristic of the northeast, east, and southeast portions of the county. They contain much quartz gravel, and the country is very broken, with a prominent growth of long- and short-leaf pine, and oaks, chestnut, and hickory. The largest trap dike in the state has its upper limit in this county just north of Newnan, and passes east of White Oak creek, with an increasing width southward into Meriwether county. Its breadth is about 125 yards. The rocks are of all sizes, very hard and rounded, the weathered and decomposed surface forming deep yellow soils; its area is not tillable.

The lands under tillage embrace 41.5 per cent. of the county area. The crops are cotton, corn, small grain, sorghum-cane, and potatoes. The acreage of cotton is by far the largest, averaging 110.2 acres per square mile, or 41.5 per cent. of the tilled lands. In the former respect the county ranks as tenth in the state and as fourth in the total number of bales produced.

ABSTRACTS FROM THE REPORTS OF A. W. STOKES AND BENJAMIN LEIGH, OF NEWNAN.

The lands of the county may be classed as—

1. *Gray sandy or pine-woods lands*, covering the largest part of the county, and having gray sandy soils, 3 inches deep, sometimes black in the pine woods from decayed vegetation. The subsoil is a pale red clay, compact and stiff, changing sometimes to a pale yellow, and to white about the swamp, baking hard when exposed, but gradually becoming like the surface soil when properly cultivated. The soil is easy to till in dry seasons, is early when well drained, and is best for cotton, to which one-half of the cultivated soil is devoted. The plant usually grows 18 inches high, and is most productive at 24, yielding 600 pounds of seed-cotton per acre on fresh land, 1,545 pounds being required to make 475 pounds of lint. After five years' cultivation the yield is reduced to 300 pounds, and 1,660 pounds make 475 pounds of lint, which is harsh, short, and dry, and generally classed one grade lower than that from fresh land. The crops are troubled with rag-weed, crab-grass, and "May-pop" vines. In warm, rainy weather the plant is liable to run to weed; topping and manuring restrain it. One-half, and in some parts of the county three-fourths of the land lies out, but if vegetable matter be applied it yields nearly as well as at first. The soil washes and gullies badly, doing serious damage to the valleys below, almost destroying their fertility. Horizontalizing and hillside ditching are resorted to with success in checking the damage.

2. The *red stiff or mulatto lands* cover about one-fourth of the county, and have a growth of post and red oaks and hickory, with some chestnut, poplar, and pine. The soil is gravelly in places, has a depth of from 4 to 8 inches and a stiff, tough red-clay subsoil, that bakes very hard when worked wet. It is properly called hard-pan, is quite impervious, and is ruinous when mixed with the soil. The soil is early if well drained and not worked too wet. It is best adapted to wheat, corn, and oats, though cotton comprises about one-third of the crops. This latter grows to a height of 2 feet, producing, when fresh, 500 pounds of seed-cotton per acre with long and strong lint. Five years' cultivation reduces the yield to 300 pounds, and the lint is shorter, harsher, and rates about two grades lower; 1,660 or 1,720 pounds are required to make 475 pounds of lint. The "May-pop" and "saw briars" are most troublesome. Two-thirds of this land now lies turned out. The land washes badly, ruining the valleys below. Terracing the uplands and leveling the valleys are found to be beneficial.

3. The *bottom lands* along the streams are very narrow, and, while extremely rich, are not as much esteemed for cotton as even the indifferent uplands. The stalk runs too much to weed, and does not mature soon enough to produce a remunerative crop before frost. Heavy manuring and thick planting seem to obviate this difficulty, especially when planted with an early variety of seed.

Cotton is sold at Newnan, the county-seat.