
PART II.

AGRICULTURAL DESCRIPTIONS

OF THE

COUNTIES OF TEXAS.

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The counties are described as a whole, and are grouped under the head of the agricultural regions to which each predominantly belongs with regard to the lands under cultivation. The regions naturally embrace small portions of many counties whose description properly belongs elsewhere, and in such cases the name of the county is given in the head list for each region, and marked with an asterisk (*), and is also given in the regular order in the text, with a reference to the region where its description may be found.

The arrangement of counties in each region is, as nearly as possible, in geographical order, beginning with the most northern; and this order is also maintained in the preliminary list for each region. The data at the head of each county description are derived from the reports of the present census.

Abstracts from reports of correspondents are appended to the description of each county from which such reports have been received. These give the more important data regarding the nature and productiveness of each soil of the county. Other information concerning the counties may be found in the tables at the beginning of this report.

RED RIVER ALLUVIAL COUNTIES.

(Comprise parts of Bowie, Red River, Lamar, Fannin, and Grayson.)

BOWIE.

Population: 10,965.—White, 6,628; colored, 4,337.

Area: 900 square miles.—Woodland, nearly all; Red river alluvial, all.

Tilled lands: 38,576 acres.—Area planted in cotton, 11,599 acres; in corn, 13,199 acres; in oats, 600 acres; in wheat, 7 acres.

Cotton production: 7,958 bales; average cotton product per acre, 0.69 bale, 1,035 pounds seed-cotton, or 345 pounds cotton lint.

Bowie, the extreme northeastern county of the state, is bounded by the Red river on the north and the Sulphur Fork on the south. Its surface is more or less rolling, and is well timbered with red, post, and black-jack oaks, hickory, and short-leaf pine on the uplands, interspersed with small open prairies in the central and western parts of the county. These prairies are very level, have a width of a mile or more and a stiff silty soil, and are not considered well adapted to cotton culture. Small clumps of trees appear on the prairies, and, together with those along the borders, are usually of low and stunted growth.

The soils of the timbered section are gray and sandy, and are from 12 to 18 inches in depth, underlaid by red and yellowish sandy subsoils (see analyses, page 24). These lands are not very much under cultivation, but yield when fresh about 800 pounds of seed-cotton per acre. In the western part of the county small mounds occur over the surface of the uplands, and mounds are also observed on the river uplands in the counties west, and in Galveston county, near the Gulf coast. In this county the mounds have the structure of the timbered uplands, viz, sandy soils and yellowish subsoils, and are from 15 to 20 feet in diameter, usually supporting the undergrowth of the region. The depressions between these mounds have a depth of several feet, with little or no shrubby growth, and are underlaid by an impervious clay. Water, when standing in these depressions, holds a white clay in suspension, thus assuming a white milky appearance.

The river lands are said to be several miles in width, have a red sandy or often clayey loam soil, and are somewhat subject to overflow in high-water seasons. The timber growth comprises walnut, pecan, hackberry, ash, sweet gum, burr and red oaks, elm, cottonwood, cypress, dogwood, bois d'arc, wild plum, etc. The county is sparsely settled, and but a little more than 6.7 per cent. of the area is under cultivation, averaging 42.9 acres per square mile. Cotton acreage comprises 30.1 per cent. of the tilled lands, or 12.9 acres per square mile, and its yield per acre, 1,035 pounds, is greater than in any other county of the state except Cameron, due chiefly to the river bottom lands. A cotton-compress is located in Texarkana.

ABSTRACT FROM THE REPORT OF H. J. H. BREUSING, OF TEXARKANA, ARKANSAS.

The chief soils of the county are those of the first and second bottoms of the Red river, the sandy timbered land of the uplands, and black prairies, and they are known to extend 60 miles east and west and more than the width of the county south of the Red river. The natural growth of this region on uplands is pine, red oak, hickory, black-jack, and post oak, and on creeks and rivers white oak, hackberry, swamp dogwood, and elm.

On the *uplands* the gray, coarse sandy and gravelly loam, 18 inches deep, alternates with bodies of stiff black prairie soil. Both kinds are early, warm, and well drained, but a little more difficult to cultivate in wet than in dry seasons. Cotton and corn are the chief crops of the region. Cotton is planted on one-half of the cultivated area, and usually attains a height of 3 feet, at which it is most productive; it inclines to run to weed in wet seasons, but may be restrained and bolling be favored by running a furrow by the side of the row. The seed-cotton product per acre of fresh land in an average season is 1,200 pounds, 1,545 pounds making a 475-pound bale of lint. After five years of cultivation the product per acre, ratio of seed to lint, and quality of the staple are about the same as at first, but the lands are most productive in the third year. Careless-weed and crab-grass are most troublesome as weeds here. Thirty per cent. of the lands first cultivated in this region now lie "turned out", and produce well only for one or two years when again cultivated. The soil washes and gullies readily on slopes, but no serious amount of damage is done to them, while the valleys are considerably improved by the washings. No efforts have been made to check the damage.

Farmers haul their cotton by wagon to Texarkana, at a cost of 75 cents per bale.

RED RIVER.

Population: 17,194.—White, 10,912; colored, 6,282.

Area: 1,060 square miles.—Woodland, greater part; oak, hickory, and pine region, 860 square miles; central black prairie, 200 square miles.

Tilled lands: 83,005 acres.—Area planted in cotton, 31,291 acres; in corn, 32,898 acres; in oats, 2,970 acres; in wheat, 1,044 acres.

Cotton production: 17,669 bales; average cotton product per acre, 0.56 bale, 840 pounds seed-cotton, or 280 pounds cotton lint.

Red River county lies between the Red river on the north and the Sulphur Fork on the south. Its surface is rolling, and comprises the black waxy and Cretaceous prairies on the south and timbered oak and hickory uplands thence to the bottom lands of the Red river. The prairie portion of the county is underlaid by white rotten limestone, the most easterly outcrop of which is seen about 4 miles east of Clarksville, the county-seat. There is an outcrop of Cretaceous marl and sand-rock at Kiamitia, on the Red River.

The bottom lands of the river consist of a "first bottom" of red sandy and clayey alluvial soil, about 10 or 15 feet above the overflowed bottom, and a much broader second bottom of a dark sandy loam 10 or 15 feet above the other. These lands have a large timber growth of walnut, ash, elm, etc., and a dense undergrowth of cane, etc. The river uplands form a broad belt of lands timbered with post oak and hickory, and have a gray sandy soil and clay subsoil. The belt is rolling, and apparently much higher than the prairies on the south, and reaches in width from the river to within 5 miles of Clarksville.

In the eastern part of the county, on the border of the prairies, the black and stiff clays that form the soils of the latter are covered by the sands and gravel of the timbered region, thus becoming the subsoils or underclays; a feature observed in the cuts in the railroad for some distance.

Of the area of the county 12.2 per cent. is under cultivation, with an average of 78.3 acres per square mile, the remainder being still unimproved. Corn is the chief crop. Cotton acreage comprises 37.7 per cent. of the tilled lands, or an average of 29.5 acres per square mile. Its yield per acre is much above that of the state at large. The rich bottom lands of the Red river, which yield an average of a bale per acre, are probably the cause of this result.

ABSTRACT FROM THE REPORT OF T. H. YOUNG, OF CLARKSVILLE.

The lowlands consist of the alluvial plains of the first and second bottoms of the Red river, and the uplands of stiff black prairie and sandy timbered lands.

The chief soil is the *black upland prairie*. It covers one-third of the uplands of the county, and is a stiff black clayey loam from 1 foot to 20 feet below the surface. The chief crops of the region are cotton and corn; but the soil is best adapted to cotton, to which one-third of the cultivated portion is devoted. The usual and most productive height attained by the cotton-plant is 4 feet, but excessive rains on all soils here incline the plant to run to weed, for which there is no remedy. The average seed-cotton product per acre is 1,200 pounds, 1,720 pounds making a 475-pound bale of lint, which rates in the market as middling. After five years' cultivation there is no change in the amount per acre or the quality of the product. The most troublesome weeds are cocklebur, crab-grass, and morning-glories. Very little of any of the lands of this region once cultivated now lie "turned out". A few years' rest make it almost as good as when fresh. The slopes of all the uplands are liable to serious damage by the washing and gullying of their soils, but the washing does not injure the valleys, and no efforts have been made to check it.

The soil of *Red river bottom* is a fine and coarse sandy, reddish loam, bearing a growth of oak, pecan, cottonwood, bois d'arc, walnut, and willow. Its color extends from 6 inches to 10 feet below the surface, and at that depth it is underlaid by clay. This soil is easily tilled in any season, and when well drained is early and warm. It is apparently best adapted to corn and cotton, and half of its cultivated area is planted in cotton. The plant attains a height of from 5 to 10 feet. The product per acre of fresh land is from 1,400 to 2,000 pounds of seed-cotton, the ratio of seed to lint and quality of the staple being the same as on the upland soils, and alike on fresh or old land. After five years' cultivation the product is 1,600 pounds of seed-cotton per acre. Crab-grass is the most troublesome weed.

The soil of the *timbered upland* embraces about two-thirds of the uplands of the county, and is covered with a timber growth of oak and hickory. It is a sandy and gravelly loam 4 inches deep, underlaid by clay, which in turn is underlaid by sand and gravel. Tillage is always easy, and the soil being early, warm, and well drained, is apparently best adapted to potatoes, fruits, and vegetables. One-fourth of it is planted in cotton. The plant attains a height of 5 feet, at which it is usually most productive. The seed-cotton product per acre is from 700 to 1,200 pounds, and after five years' cultivation it is from 300 to 800 pounds. The troublesome weed is crab-grass.

Most of the cotton of this county is raised on Red river bottom lands and on black prairie lands. The best crops are made on these lands in the driest seasons we have. The sandy uplands need more rain.

Cotton is shipped, as baled, to Saint Louis, New Orleans, or Galveston, at \$4 25 to \$4 50 per bale.

LAMAR.

Population: 27,193.—White, 20,445; colored, 6,748.

Area: 900 square miles.—Woodland, nearly one-half; oak, hickory, and pine region, 400 square miles; central black prairie, 500 square miles.

Tilled lands: 123,533 acres.—Area planted in cotton, 40,390 acres; in corn, 40,617 acres; in oats, 5,651 acres; in wheat, 3,047 acres.

Cotton production: 24,623 bales; average cotton product per acre, 0.61 bale, 915 pounds seed-cotton, or 305 pounds cotton lint.

Lamar county is bounded on the north by the Red river and on the south by the north prong of the Sulphur Fork, the Texas and Pacific railroad marking the divide between their tributaries. The surface is rolling, and, as in other counties of the belt, comprises three classes of land—Red river bottoms, sandy timbered uplands along both rivers, and the black prairies of the central prairie region on the south of Paris. The river lands are broad, and include the first and second bottoms as already described in Red River and Bowie counties. (See analyses, page 43.)

The uplands of Red river have a width of 10 or 15 miles, are high and rolling, and are timbered with a growth of post and black-jack oaks, hickory, etc. The soil is sandy and underlaid by clayey subsoils, and is locally known as "wire-grass lands". The timbered lands of Sulphur Fork have a width of 5 or 6 miles. The prairies cover a large part of the county with their heavy, black waxy, and hog-wallow soils, and are generally devoted to stock-grazing, the light and easily tilled sandy lands being preferred for farming purposes.

About 21.4 per cent. of the county area is under cultivation, giving an average of 137.3 acres per square mile. The crops are chiefly corn, cotton, rye, oats, wheat, vegetables, and fruit. Cotton has the largest acreage, and comprises 32.7 per cent. of the tilled lands, or 44.9 acres per square mile. Its yield per acre in 1879 was exceeded only by two counties in the state (among those whose production is more than 100 bales), viz, Bowie and Brazoria. The average yield of corn is said to be 30 bushels per acre, and of wheat 20 bushels. Fruits do well in the timbered uplands on the north.

Farmers usually sell their products to buyers in Paris, the county-seat, who ship it thence by railroad to other markets.

FANNIN.

Population: 25,501.—White, 22,081; colored, 3,420.

Area: 890 square miles.—Woodland, about one-fourth; oak, hickory, and pine region, 230 square miles; central black prairie, 660 square miles.

Tilled lands: 156,725 acres.—Area planted in cotton, 44,813 acres; in corn, 48,124 acres; in oats, 9,698 acres; in wheat, 7,753 acres.

Cotton production: 22,386 bales; average cotton product per acre, 0.50 bale, 750 pounds seed-cotton, or 250 pounds cotton lint.

The surface of Fannin county is undulating, and is watered by numerous small streams, the tributaries of Red river, Sulphur Fork on the north and east, and of the Trinity river on the south. About one-third of its area is timbered with walnut, post oak, elm, ash, bois d'arc, etc., the rest being an undulating prairie, with black waxy and sandy lands, and having no timber growth except a few scattering oaks. On the north of the county the first and second bottoms of Red river have a width of from 1 mile to 2 miles and a heavy timber growth of walnut, pecan, ash, hackberry, mulberry, cottonwood, etc., the first having a deep soil of a red waxy nature, or a red sand in localities, and the second or hummock land, 10 or 15 feet higher, having a dark loam soil and a greater width. Adjoining these bottoms on the south are high uplands from 10 to 15 miles wide, timbered with oak and hickory, and having a sandy soil and clayey subsoil, with white quartz gravel and pebbles. There is a little open and sandy prairie on these uplands. These lands are called "wire-grass lands". South from this are the open prairies and black lands of the central prairie region. Immediately adjoining the timbered lands the prairie soils are dark sandy, but the subsoils are the usual stiff clays of the region.

A little more than one-fourth of the area of this county is under cultivation, the average being about 176.1 acres per square mile. The remainder of the county is in its original condition. Corn is the chief crop of the county, cotton being next, with an average of 50.4 acres per square mile, or 28.6 per cent. of the tilled lands. The average yield per acre for the county was in 1879 quite high. Corn on the lowlands is said to yield as much as 50 bushels per acre; on the uplands from 15 to 25 bushels; wheat 15, and oats from 40 to 50 bushels per acre.

ABSTRACTS FROM THE REPORTS OF JOHN L. BLAIR, OF HONEY GROVE, AND THOMAS LIGHTFOOT, OF BONHAM.

The soils of this region endure either wet or dry seasons very well. The climate is favorable, the seasons are sufficiently long, and the region is not liable to insect pests. The most unfavorable circumstance is a very wet season. The largest yields of cotton are produced in dry, hot summers. The river bottoms are planted in cotton almost exclusively, and are owned by "planters"; for small cereals they are too low.

The kinds of soil cultivated in cotton are black waxy prairie, black coarse sandy loam, and light, fine sandy soil, timbered and prairie.

The *black waxy prairie* extends 13 miles north and south and 30 miles east and west, and along the streams are narrow belts of timber, consisting of bois d'arc, elm, ash, and hickory. The soil maintains its color to depths varying from 2 to 10 feet, about one-half of which rests upon a soft white stone, down to which there is no change in its quality, the other half having a subsoil of heavy red clay that is seldom touched by the plow. The soil is warm, generally well drained, easily cultivated, and apparently best adapted to corn, cotton, and oats; wheat is also one of the crops of the county. Cotton occupies three-tenths of the cultivated portion of this soil. The plant usually attains a height of 4 feet, but is most productive at 3 feet. When allowed too much space, and in wet seasons, the plant inclines to run to weed, but may be restrained by topping and by drawing the soil from the plant. The seed-cotton product per acre of fresh

land is 1,000 pounds, 2,100 pounds making a 475-pound bale of lint, which rates in the market as ordinary. After ten years' cultivation the product is from 800 to 900 pounds per acre, and 2,140 pounds make a 475-pound bale. Buyers here make no distinction as to quality of staple. The most troublesome weeds on this land are cocklebur and crab-grass.

The *black sandy loam soil* covers one-fifth of the county, and lies on either side of the black waxy soil, for a width of 3 miles and through the length of the county. It has a natural growth of bois d'arc, post oak, hickory, pecan, and elm. The soil changes color at 2 inches from the surface; the subsoil is a buff-colored leachy clay, containing rounded pebbles, underlaid by sand and gravel at 2 feet. The soil is early, warm, and well drained, easy to cultivate at any time, and is apparently best adapted to cotton, which comprises one-half the cultivated area. The plant usually attains the height of 5 feet, but is most productive at 4 feet. The seed-cotton product per acre of fresh land is 1,200 pounds, 1,650 pounds making a 475-pound bale of lint. After ten years' cultivation the product is 600 pounds, and 1,780 pounds then make a 475-pound bale of lint, which rates much lower than that from fresh land. The worst weed is crab-grass. About one-twentieth of this land originally cultivated now lies "turned out"; it is very much improved by rest. The soil on slopes washes and gullies readily, and serious damage results to them, but not to the valleys. Successful efforts are made to check the damage by hillside ditching and horizontalizing.

The *light sandy soil* covers three-tenths of the county, and embraces a tract 9 miles wide and 30 miles long. Its natural growth is post and black oaks and wild grape-vines. The soil is 10 inches deep; the subsoil is heavier but leachy, and contains hard white gravel pebbles, underlaid by gravel at 3 feet. The soil is well drained and easily tilled, but is late and cold, and is apparently best adapted to orchards and grasses. One-tenth of it is planted in cotton, the plant usually attaining a height of 2 feet. The seed-cotton product per acre is 300 pounds when the land is fresh, but after ten years' cultivation the soil is exhausted. Nineteen hundred pounds make a 475-pound bale of lint. Crab-grass, the most troublesome weed, grows luxuriantly on this soil, one-fourth of which has been exhausted, "turned out," and not again cultivated. The slopes are seriously damaged by washing and gullying; the valleys are not injured. Unsatisfactory attempts have been made to check the damage by horizontalizing and hillside ditching.

Cotton is shipped in December, by rail, to Saint Louis and Galveston, at \$4 50 per bale.

ABSTRACT FROM THE REPORT OF GIDEON SMITH, OF BONHAM.

The lands of the county embrace the first and second bottoms of Red river and hummocks of the lowlands, and sandy timbered lands and black waxy prairies of the uplands. There is still another variety of upland, known as "wire-grass" lands, a medium between black waxy and sandy, combining the bad qualities of both and not much of their good ones. The Red river bottom lands, both waxy and sandy, comprise about one-half of the lands of this region. Their natural growth is cottonwood, pecan, black walnut, hackberry, mulberry, and white hickory.

The chief crops of this county are cotton, corn, and all the small cereals. All fruits, especially apples, do well.

The soils of the *bottoms* comprise both light sandy and heavy clay loams about 10 feet in depth. The lands are easily tilled, and are best adapted to cotton, which covers about one-fourth of the land under cultivation. The plant grows to a height of 6 feet, and runs to weed in wet seasons, which can be prevented by frequent plowing. The seed-cotton product per acre is from 1,000 to 2,000 pounds both on the fresh land and after twenty-five years' cultivation. The staple from old lands is not quite so silky or long, and is a little rougher to the touch than that from fresh lands. The troublesome weeds are all the varieties of careless-weed, purslane, hog-weed, and bur-grass. None of the lands lie "turned out", as they are thought to improve by continued culture, especially if the stalks, etc., are not burned. This applies also to other lands of the county.

The "*wire-grass*" lands, covering about one-third of the area of the county, comprise both a high and low grade of farming land, and have a natural growth of post, black-jack, and red oaks, elm, some hickory, hackberry, etc. The soil is a gray sandy loam, 6 inches or more in depth. The subsoil is generally lighter in color and heavier than the surface soil. The larger portion has no subsoil, there being only a gradual fading of color; some is leachy, but the greater part is impervious. It contains white gravel and rounded angular pebbles. The subsoil is underlaid by sand, gravel, and occasionally by rock at from 1 foot to 10 feet. The soil is usually easily tilled, and is best adapted to corn and cotton, and one-sixth of the land under cultivation is devoted to the latter crop. Cotton usually attains a height of from 2 to 5 feet, being most productive at from 3 to 4 feet. Running to weed is prevented by thorough draining and frequent plowing. The seed-cotton product per acre is from 800 to 1,200 pounds, and from 1,425 to 2,400 pounds make 475 pounds of middling lint. The weeds troublesome on this soil are careless, purslane, hog, wild flax, and yellow-blossom. A very small amount of this land lies "turned out". The soil washes considerably on the slopes, and is becoming seriously damaged; but the valleys are not yet injured by the washings, and but little has been done to check it.

The "*wire-grass*" and *post-oak flats* (lime points) comprise about one-tenth of the county, and considerable of it is of a high grade and is fair farming land; most of it, however, is more valuable for grazing than for anything else. The natural growth is post, black-jack, and some red oaks and elm. The soil is heavy, soapy, and putty-like, varying in depth from 1 inch to 24 inches. The subsoil is lighter in color and more tenacious than the soil, some of it leachy and much of it impervious, and contains hard and soft black gravel on the high points, where it is somewhat limy, underlaid by sand and gravel, and occasionally by rock. The land is easily tilled in wet weather, but in dry seasons it bakes hard. It is early, warm, and much of it is well drained, and it is better adapted to cotton than to any other crop. About one-twentieth of the land is devoted to cotton, which usually attains a height from 1 foot to 2 feet, but produces best at 18 inches. The seed-cotton product per acre is from 300 to 1,000 pounds, and from 1,540 to 1,800 pounds make a 475-pound bale. The staple is injured. Much of the land improves with cultivation. The weeds troublesome to this soil are wild flax, yellow-blossom, and crab-grass. A considerable amount of this land lies "turned out". The soil washes or gullies readily on the slopes, and this is considered rather an advantage, by affording drainage. Much of this land is known as flatwoods, flat post-oak land, and flat prairie. Cattle, horses, and hogs do well on it.

The climate is most favorable to cotton production. Crops are not liable to be troubled by insects, boll-worms, and caterpillars, and yet there is sufficient time for maturity. Much of the soil is favorable to extreme wet or dry seasons, as all the river lands, though level, possess a large absorbing power, holding all the water which falls on them, and still are free from swamp or seepy land. The same may be said of the uplands where undulating, especially of the black and waxy, of which there is a large percentage. We succeed now in raising quite abundant crops—from 40 to 60 bushels of corn and generally 500 pounds of cotton lint, and occasionally as much as 1,000 pounds of lint are the yields per acre; but these yields can be increased by planting every third or fourth row of the cotton crop in corn; if every third row, the corn will bear crowding to the extent of holding as much in one row as is ordinarily here put in three.

GRAYSON.

Population: 38,108.—White, 33,549; colored, 4,559.

Area: 960 square miles.—Woodland, about one-third; oak, hickory, and pine region, 140 square miles; central black prairie, 660 square miles; lower cross timbers, 160 square miles.

Tilled lands: 185,532 acres.—Area planted in cotton, 41,339 acres; in corn, 56,344 acres; in oats, 10,009 acres; in wheat, 15,736 acres.

Cotton production: 19,166 bales; average cotton product per acre, 0.46 bale, 690 pounds seed-cotton, or 230 pounds cotton lint.

Grayson county comprises open black prairie, timbered uplands, and Red river alluvium. The general level of the country is about 700 feet above the sea; its surface is undulating, and is almost entirely susceptible of tillage.

The southern part of the county, comprising perhaps three-fourths of its area, is an open prairie, broad and undulating, without timber, except on the streams, which are not numerous. The soil is of the black waxy nature peculiar to the central prairie region, except near the timbered lands, where it is more sandy. These prairies are mostly given up to stock-grazing, with only occasional farms.

Immediately north of the prairies there is a belt of timbered uplands lying along and parallel with the river bottoms and having a growth of post, red, and black oaks, hickory, etc. The soil is sandy, with some ferruginous gravel and a yellowish sandy subsoil, and is underlaid by a hard limestone at a depth of a few feet.

The river bottoms north of Denison are 1 mile wide, and are composed of a first bottom of a deep red sandy soil, heavily timbered, and a second bottom, or hummock, of a dark sandy loam, extending back to the foot of the bluff, where it becomes black and somewhat waxy and calcareous, from the rotten limestone that outcrops in the abrupt bluffs. The timber growth is cottonwood, elm, ash, walnut, pecan, hackberry, etc. These lands are rich and productive, yielding, it is claimed, fully a bale per acre. In this county the uplands seem to be preferred. Rotten limestone is the prevailing rock throughout the county, and Cretaceous fossils are abundant in many localities.

The lands under cultivation comprise 30.2 per cent. of the county area, averaging 193.3 acres per square mile; but four counties in the state have a greater percentage. Corn is the chief crop of the county, its acreage being greater than that of any other, cotton ranking next, with an average of 43.1 acres per square mile, or 22.3 per cent. of tilled lands. The average yield of crops other than cotton on the river bottoms is: corn, from 25 to 40 bushels; wheat, 18 to 20 bushels; oats, 50 bushels per acre.

ABSTRACTS FROM THE REPORTS OF M. T. BRACKETT AND J. P. HOPSON, OF SHERMAN.

The lands are very fertile, and we have the long and sunny months, so necessary for the production of cotton. The first bottom of Red river is a red sandy loam from 6 to 10 feet deep. Cotton is raised chiefly on the uplands, which consist of the black waxy prairie soil and black, fine sandy and gravelly loam.

The *black waxy soil* covers from one-half to two-thirds the area of this region, and extends 100 miles east, 150 west, 60 south, and 10 miles north. It is chiefly prairie, bearing only grass. The depth from the surface to the change of color in the soil varies from 6 to 48 inches. The subsoil is a yellowish clay, mixed with white limestone gravel, and occasionally with pebbles. It is an impervious hard-pan, and is underlaid by blue and white rock at from 5 to 20 feet. Tillage is difficult in wet but easy in dry seasons; the soil is early, cold, and well drained, and endures drought well. The chief crops produced in this region are cotton, corn, wheat, oats, barley, sweet potatoes, and sorghum; but the soil is apparently best adapted to cotton, wheat, sorghum, and oats. One-fourth of the cultivated area is planted in cotton, the usual and most productive height attained by the plant being 5 feet. In very wet seasons, especially in July and August, the plant inclines to run to weed, which may be restrained by taking off the top bud when a sufficient height is attained. The average product of seed-cotton per acre is 1,200 pounds, and 1,775 pounds make a 475-pound bale of lint, which rates in the market as middling. After ten years' cultivation the product is about 800 pounds per acre, the ratio of seed to lint being the same and the staple finer and stronger, but not so long as that from fresh land. The most troublesome weeds are the Canadian thistle, crab-grass, careless-, and rag-weeds. No land that has been cultivated lies "turned out". The soil washes and gullies but little on slopes, but they are not yet seriously damaged, nor are the lower lands much injured by the washings.

The *fine sandy and gravelly loam* covers one-fourth the area of this region, but occurs in rather small bodies, and bears a natural growth of post, red, and black oaks, hickory, hackberry, ash, pecan, and walnut. The soil is dark, 12 inches thick, and its yellow subsoil is an impervious hard-pan, containing soft, white, angular fragments, underlaid by yellow sand and gravel and white rock at 6 feet. The soil is early, warm, well drained, and easily tilled in any season, and one-half of its area is devoted to cotton. The usual and most productive height of the plant is 3 feet. The seed-cotton product per acre is about 1,250 pounds, equal to about 400 pounds of lint, which rates in the market as middling. The staple from old land is finer, if anything, but the ratio of seed to lint is the same as in the case of fresh land. The most troublesome weeds are cockleburrs and crab-grass. The surfaces of slopes readily wash into gullies, but no serious damage is done, and no efforts are made to check it.

Cold rains in the early part of the season check the growth of cotton on the bottom land and sometimes give it the sore-shin; but this is not common unless planted early.

Cotton is shipped as soon as baled, by rail, to New York at \$5 per bale, and to Galveston at \$4.

OAK, HICKORY, AND SHORT-LEAF PINE REGION.

(Comprises all or parts of the counties of Bowie,* Red River,* Lamar,* Fannin,* Cass, Morris, Titus, Franklin, Hopkins, Rains, Wood, Camp, Marion, Upshur, Gregg, Harrison, Panola, Rusk, Smith, Van Zandt, Kaufman,* Henderson, Navarro, Limestone, Freestone, Anderson, Cherokee, Nacogdoches, Shelby, Sabine, San Augustine, Angelina, Trinity, Polk, Houston, Leon, Falls,* Robertson, Madison, Walker, San Jacinto,* Grimes, Waller,* Brazos, Burleson, Milam, Lee, Bastrop, Caldwell,* Fayette,* Washington,* Austin,* Colorado,* Lavaca,* Gonzales, Guadalupe,* Bexar,* Wilson, De Witt,* Goliad,* Bee,* Karnes,* Atascosa,* Frio,* and Medina.* *Lower cross timbers*.—Cooke,* Grayson,* Denton,* Tarrant,* Dallas,* Johnson,* Hill,* and McLennan.* *Upper cross timbers*.—Montague,* Wise,* Parker,* Palo Pinto,* Hood,* Erath,* Comanche,* and Hamilton.* All of the above cross timbers counties, except Comanche, are described in the central black prairie region; Comanche, in the northwestern red-loam region.)

BOWIE.

(See "Red river alluvial region".)

RED RIVER.

(See "Red river alluvial region".)

LAMAR.

(See "Red river alluvial region".)

FANNIN.

(See "Red river alluvial region".)

CASS.

Population: 16,724.—White, 10,274; colored, 6,450.

Area: 950 square miles.—Woodland, all; oak, hickory, and pine region, all.

Tilled lands: 83,069 acres.—Area planted in cotton, 34,822 acres; in corn, 34,410 acres; in oats, 3,188 acres; in wheat, 363 acres.

Cotton production: 16,181 bales; average cotton product per acre, 0.46 bale, 690 pounds seed-cotton, or 230 pounds cotton lint.

The surface of Cass county is somewhat rolling and broken. It is bounded on the north by the Sulphur Fork, flowing eastward, and, with its small tributaries, watering that part of the county. The streams on the south flow southeast into Caddo lake. Tertiary iron-ore hills are reported to be numerous, especially on the south of Linden, the county-seat, where much of the country is too broken for cultivation.

The soils of the uplands vary from the gray to red sandy, with areas of white sands, underlaid very generally by red sandy or, in places, by clayey subsoils. Cass county is well timbered with oak, hickory, and short-leaf pine, and while principally an agricultural county, only about 13.7 per cent. of its area is under cultivation, averaging 87.4 acres per square mile. Cotton and corn are the chief crops, the acreage of the former being somewhat the larger, comprising 41.9 per cent. of the tilled lands, or 36.7 acres per square mile. The seed-cotton yield per acre in 1879 was much above the average of the state, and compares very favorably with the best of the upland counties.

ABSTRACT FROM THE REPORT OF J. J. FOWLER, OF LINDEN.

The surface of the county is quite varied, comprising hilly, rolling, and level lands. The uplands occur in tracts containing from 50 to 1,000 acres each. The soils devoted to the cultivation of cotton may be classed as red lands (forming about one-half of the area of the county), the gray lands, and the white sandy lands.

The timber growth of the *red lands* is pine, black and white oaks, and dogwood, and the depth of the soil varies from 18 inches to 4 feet. The subsoil is similar to the surface soil, but somewhat heavier. The land is easily cultivated, and is early, warm, and well drained. Cotton, corn, sweet potatoes, pease, and pinders (peanuts) constitute the chief crops. About three-fourths of the land is devoted to cotton, which varies in height from 3 to 6 feet; the best yield is obtained at 4½ feet. There is in wet seasons a tendency of the plant to run to weed, which can be restrained by cultivation. On fresh land from 1,000 to 1,500 pounds of seed-cotton may be produced per acre; after ten years' cultivation this yield is reduced to from 500 to 1,000 pounds, the staple remaining the same as when the land was fresh. The most troublesome weed on this soil is crab-grass. One-fifteenth of this land lies "turned out", producing good crops when again cultivated. The valleys are improved by the washing of the soil on slopes, and the uplands are not injured.

The *gray lands* are devoted to cotton and corn, and the timber growth is pine and dogwood. The soil, a gray sandy loam, covering about one-fifth of the surface of the county, is from 3 to 6 feet deep, overlying a red sandy subsoil. It is easily cultivated, is early, warm, and well drained, and best adapted to cotton, which forms three-fourths of the entire crops. The height of the plant ranges from 3 to 5 feet, the latter being the most productive. In production, etc., this soil is similar to the one just described.

About one-sixth of the tillable area is composed of the *white sandy soil*, having a depth of from 6 to 10 feet, with a light red subsoil, the natural growth being pine and black-jack oak. It is easily tilled, is early, warm, and well drained, and best adapted to cotton. Cotton comprises three-fourths of the crops, which attains a height of from 3 to 5 feet, the latter being preferred. The yield from fresh land is from 1,000 to 1,800 pounds. The production of this soil, after ten years' cultivation, is similar to that of soils previously mentioned. Crab-grass is the most troublesome weed. The soil washes readily on slopes, doing serious damage, but the valleys are not injured. About one twentieth of this land lies "turned out", producing very well when again cultivated.

Shipments are usually made in October by railroad to Galveston and Saint Louis.

MORRIS.

Population: 5,032.—White, 2,988; colored, 2,044.

Area: 260 square miles.—Woodland, all; oak, hickory, and pine region, all.

Tilled lands: 29,160 acres.—Area planted in cotton, 10,650 acres; in corn, 11,082 acres; in oats, 1,256 acres; in wheat, 275 acres.

Cotton production: 4,880 bales; average cotton product per acre, 0.46 bale, 690 pounds seed-cotton, or 230 pounds cotton lint.

Morris is one of the smallest counties of the state, and is bounded on the north by the Sulphur river, while the small streams of the southern portion flow eastward into Caddo lake. The surface of the country is more or less rolling and well timbered with oak, hickory, and short-leaf pine, the latter growth prevailing chiefly on the south of the county-seat. The uplands are sandy and gravelly, with some red clayey soils, and are underlaid usually by red clays. The bottom lands are stiff and dark, partly subject to overflow, and have a timber growth of white oak, walnut, sweet gum, etc. Morris is chiefly an agricultural county, the lands under tillage comprising 17.5 per cent. of its entire area, and averaging 112.2 acres per square mile. Corn and cotton are the principal crops, the acreage of the latter being the smallest, viz, 41 acres per square mile, or 36.5 per cent. of the tilled lands. The average yield per acre in seed-cotton in 1879 was 690 pounds, which was surpassed by only a few counties in the state.

ABSTRACT FROM THE REPORT OF JAMES M. BAKER, OF WHEATVILLE.

Crops rarely fail in this region; but cotton is sometimes injured by excessive rains in July and August, causing it to shed its forms, and by cool nights in April, May, and June.

The chief soil cultivated in cotton is a *dark red, sandy and gravelly, rolling, timbered upland*, and embraces very nearly the southern half of the county. Its natural growth is red, black-jack, white, and post oaks, hickory, sumac, and some pine south and east of Daingerfield. The soil is 2 feet deep; the subsoil is a very red, firm, impervious clay, sometimes yellowish, with white streaks, termed "calico clay". It contains hard, rough, "black gravel" (rich red iron ore), underlaid in the northern part of the county by hard limestone at from 1 foot to 12 feet. Tillage is very easy in dry and very difficult in wet seasons, and the soil is in most localities well drained and apparently well adapted to corn, cotton, potatoes, pease, peanuts, chufas, watermelons, and squashes, these, excepting the two last named, with sugar-cane, constituting the chief crops of this region. One-half the cultivated area is planted in cotton, which usually attains a height of 4 feet, at which it is most productive; but it inclines to run to weed in wet weather and when cultivated with the turning plow, to restrain which and favor bolting plowing should be stopped and the hoe freely used. The seed-cotton product per acre is from 1,000 to 1,200 pounds, the staple rating as low middling. After ten years' cultivation the product per acre is from 800 to 1,000 pounds, and 1,545 pounds then make a 475-pound bale of lint, the staple being generally shorter than that from fresh land. Hog-weeds, red careless-weeds, and a large weed resembling the rag-weed are the most troublesome. Very little of such land originally cultivated now lies "turned out", and for a while it is as good as fresh when again cultivated. Slopes are damaged to a serious extent by washing and gullyng, and the valleys are sometimes seriously damaged by the washings. Efforts have been made to check the damage, and with success when continued.

The *bottom lands* of White Oak river, comprising about one-fourth of the cultivated area, subject to overflow in spring and considered unhealthy, are covered with a natural growth of white, post, and overcup oaks, hickory, black walnut, and sweet gum. The soil is black, stiff, and tenacious when wet, and from 10 to 15 feet deep. The subsoil is heavier, of a grayish color, inclined to be chalky, and is underlaid by limestone at from 6 to 20 feet. Tillage is generally difficult in wet or dry seasons. The soil is late and cold, and most always ill drained, and is apparently best adapted to cotton, corn, and sugar-cane, about two-thirds of its cultivated area being devoted to cotton. The plant usually attains a height of from 5 to 8 feet, but is most productive at 5 or 6 feet, and inclines to run to weed in dry and hot weather. The seed-cotton product per acre is from 1,500 to 2,000 pounds, rating low middling; after ten years' cultivation the product varies from 1,800 to 2,500 pounds, and the staple is then about the same as that from fresh land. The cocklebur and sheep-sorrel are the troublesome weeds. Very little of such land lies "turned out"; it is improved 25 per cent. by washings from the slopes.

Cotton is shipped chiefly in December, by rail, to Texarkana and Jefferson at \$1 25 per bale.

TITUS.

Population: 5,959.—White, 4,609; colored, 1,350.

Area: 420 square miles.—Woodland, nearly all; oak, hickory, and pine region, all.

Tilled lands: 30,507 acres.—Area planted in cotton, 9,395 acres; in corn, 11,379 acres; in oats, 1,997 acres; in wheat, 372 acres.

Cotton production: 4,923 bales; average cotton product per acre, 0.52 bale, 780 pounds seed-cotton, or 260 pounds cotton lint.

Titus county is very similar in many of its features to the counties adjoining it on the east. The difference is chiefly in the absence of a pine growth and the occurrence on the northwest of the first of the dark-loam prairies that are found interspersed throughout the timbered lands near the border of the central black prairie region.

Sulphur Fork forms the northern and Big Cypress creek the southern boundary of the county, while White Oak creek flows parallel to the former on the north. The uplands are rather level, and, except near the streams, have a dark sandy soil, and are well timbered with oaks and hickory. The alluvial lands of the streams have a timber growth of elm, sycamore, birch, sweet gum, etc. Titus is chiefly an agricultural county, the lands under tillage comprising about 11.3 per cent. of its entire area, averaging 72.6 acres per square mile. Of these 30.8 per cent., or 22.4 acres, is devoted to the culture of cotton, and 37.3 acres to that of corn.

The average yield in seed-cotton for 1879 was 780 pounds, an amount exceeded by only 12 counties in the state, and 7 of those have each a production of less than 100 bales.

ABSTRACT FROM THE REPORT OF J. W. JACKSON, OF MOUNT PLEASANT.

The lowlands consist of the first and second bottoms of creeks and rivers; the uplands of large bodies of level timbered lands (a little broken near streams), generally all tillable. The growth of cotton is sometimes hindered on lowlands by excessive rains in spring, and sometimes the crop is prematurely frost-killed on such land in the fall.

The chief cotton-producing soil is the *black sandy upland*, which embraces three-fifths of the lands at present cultivated in this county, and extends over the entire county, excepting a small strip of black prairie in the northwestern corner. Its natural timber is hickory, and red, black, post, and black-jack oaks. The soil is a blackish and black fine sandy loam 8 or 10 inches thick; the subsoil is a tenacious dark red clay, which bakes if moved while wet, but pulverizes and mixes beneficially with the soil if plowed while moderately dry, and contains soft "black gravel", underlaid by gravel and sometimes by rock at the depth of 2 feet. Tillage is always easy, and the soil is early and warm when well drained and deeply plowed. The chief crops of this region are corn, cotton, wheat, oats, potatoes, sugar-cane, sorghum, tobacco, rice, and pease. The soil is equally well adapted to all, but cotton occupies from one-third to one-half of this soil. The plant attains a height of from 4 to 6½ feet, but is most productive at from 4 to 5 feet when proper distances are allowed between plants. If the soil has not been stirred well until the plant is far advanced, and the rainfall then becomes excessive, the plant is inclined to run to weed. To prevent this and to favor bolting the soil should be well tilled; then, if the season becomes wet, break the roots on one side of each row with a scooter-plow, and five or six days later break those on the other side. The product per acre of seed-cotton is from 1,000 to 1,200 pounds, 1,500 pounds making a 475-pound bale of lint, which rates as first class in market. After ten years' cultivation the product is from 800 to 1,000 pounds, and to make a 475-pound bale of lint then requires 1,465 in a dry season or 1,495 pounds in a wet season, and the staple is a little shorter and coarser than that from fresh land. The most troublesome weeds on all soils of this region are cocklebur, careless-weed, rag-weed, hog-weed, and crab-grass. About one forty-fifth of this land once cultivated now lies "turned out", and this is on hillsides, where the soil has been washed away; but from one-half to two-thirds of a crop may be raised from such lands if in the preceding fall a green crop be turned under. Slopes wash and gully readily where the subsoil consists of joint clay or sand; but as sands are very deep, the damage is very trifling to slopes, and very little damage, if any, is done to the valleys. Hillside ditches have occasionally been made to check such washings, and with complete success. The same is true of slopes of the remaining two kinds of land.

The *bottom land of the small streams* is a dark sandy loam, a little heavy, and having a growth of hickory, pecan, birch, white, pin, and burr oaks, walnut, and gum. The soil is a black loam, somewhat heavy, from 12 to 24 inches deep. The subsoil is stiff, impervious when undisturbed, very tenacious, varying in color from brownish to bluish-gray, containing soft, rounded "black gravel", and is further underlaid by grayish-blue clay. Tillage is easy when dry, somewhat difficult when too wet, but when broken early is quite easy and pleasant. The soil is early and warm when well drained and deeply plowed, and is best adapted to cotton, corn, small cereals, sugar-cane, and pease. From one-third to one-half the soil is occupied by cotton. The plant attains the height of from 5 to 7 feet, and is most productive at from 4 to 5 feet if proper distance is allowed between the rows. If the soil be well prepared and after-cultivation be thorough, the plant inclines to run to weed in June during good seasons; this is restrained as on the soil last described. The seed-cotton product per acre is from 1,200 to 1,800 pounds; after ten years' cultivation (unmanured) the product is from 1,000 to 1,500 pounds, or more if rotation of crops has been regularly practiced. The ratio of seed to lint and quality of the staple are as on the soil last described.

The *bottom lands of the larger streams*, viz, White Oak, Cypress, and Sulphur creeks, lie in scattered bodies throughout the county, including some prairie and low bottom soils. Its growth is white, post, burr, and pin oaks, hickory, walnut, elm, gum, linden, and mulberry. The soil is a rather dark, stiff clayey loam from 12 to 24 inches thick, and is underlaid by a heavier subsoil of bluish-yellow, tenacious clay, usually fine and waxy, and impervious when undisturbed; it contains "black gravel" nearly as soft as the subsoil itself, and is underlaid by a clay resembling soapstone. The soil is easily tilled in dry seasons if broken deep and early, but with some difficulty in wet seasons; if well drained it is early and warm, but if ill drained it is late and cold, and is best adapted to corn, cotton, and pease. The proportion planted, height attained, circumstances of running to weed, etc., are the same as on the other bottom land described. The seed-cotton product per acre is from 1,000 to 1,500 pounds, 1,500 pounds making a 475-pound bale of lint, which rates as first class. After ten years' cultivation the product is from 1,000 to 1,200 pounds, and 1,550 pounds make a 475-pound bale of second-class lint, the same being shorter and coarser than that from fresh land. None of this soil lies "turned out".

Merchants ship cotton by rail to Galveston at \$3 50, to Saint Louis at \$4, or to New Orleans by water at \$1 50 per bale.

FRANKLIN.

Population: 5,280.—White, 4,666; colored, 614.

Area: 300 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 25,528 acres.—Area planted in cotton, 8,660 acres; in corn, 9,804 acres; in oats, 1,519 acres; in wheat, 489 acres.

Cotton production: 4,048 bales; average cotton product per acre, 0.47 bale, 705 pounds seed-cotton, or 235 pounds cotton lint.

Franklin is one of the tier of counties that are bounded on the north by the Sulphur Fork and watered by White Oak and Big Cypress creeks. Its surface is rather level, except near the streams, where it becomes more or less rolling and broken. The uplands are timbered with red, post, and black-jack oaks, hickory, etc., and have a dark sandy soil, underlaid by heavy clay subsoils. The bottom lands are dark and stiff in character, and have a timber growth of white oak, walnut, ash, elm, pecan, etc. The crops of the county are corn, cotton, small grain, and potatoes. Lands in cultivation comprise 13.3 per cent. of the county area, or 85.1 acres per square mile.

Corn is the chief crop of the county, its acreage being larger than that of cotton, and its average yield from 15 to 20 bushels per acre.

Cotton comprises about one-third of the tilled lands, and averages 28.9 acres per square mile. The general character and productiveness of the lands, the methods of tillage, etc., are the same as described by the correspondents for Titus and Hopkins counties.

Shipments are made by wagon to the nearest railroad stations.

HOPKINS.

Population: 15,461.—White, 13,306; colored, 2,155.

Area: 750 square miles.—Woodland, about three-fourths; oak, hickory, and pine region, 620 square miles; central black prairie region, 130 square miles.

Tilled lands: 85,792 acres.—Area planted in cotton, 19,242 acres; in corn, 25,573 acres; in oats, 7,974 acres; in wheat, 3,804 acres.

Cotton production: 8,279 bales; average cotton product per acre, 0.43 bale, 645 pounds seed-cotton, or 215 pounds cotton lint.

Hopkins county is about equally divided between prairie and timbered lands, the latter occupying the eastern half. The surface of the prairie lands is undulating, while that of the rest is rather rolling.

The water-divide between the tributaries of the Red and those of the Sabine river passes through this county in an easterly course. These tributaries furnish an abundant supply of water to portions of the county, the south prong of the Sulphur Fork forming the northern boundary.

The prairie lands seem to be devoted to grazing purposes, although they have partly the rich black clayey soil of the central prairie region. Their difficult tillage probably makes them less desirable than the sandy lands of the timbers. Other parts of these prairies have a stiff, gray land, not well adapted to tillage.

The timbered lands have a grayish sandy soil, easily cultivated and very productive, yielding about 700 pounds of seed-cotton per acre. Corn is the chief crop of the county, its yield being an average of 12 bushels per acre; that of oats is 20 bushels, and of wheat 5 bushels per acre.

The county is rather sparsely settled, the average being about 20.6 persons and 114.4 acres of tilled lands per square mile. The cotton acreage per square mile is about 25.7, or 22.4 per cent. of the tilled lands, and is confined chiefly to the sandy timbered lands.

ABSTRACT FROM THE REPORT OF B. M. CAMP, OF SULPHUR SPRINGS.

One-half the county consists of stiff, gray, rolling prairie land. The timbered half has a deep, gray, sandy, alluvial soil, and embraces mostly the uplands, together with the bottoms of small streams. It is commonly designated *deep sandy land*, and is the chief soil cultivated in cotton. Two thirds of the cultivated land is of this kind, and it extends 25 miles east, 50 miles south, and half-way across the county to the north and west. Its natural growth is post, red, and black-jack oaks, and briery underbrush. The soil is from 6 to 12 inches deep. The subsoil is lighter, contains a few pebbles in places, and is underlaid by sand, gravel, or rock at various depths. The soil is early, warm, well drained, easily cultivated, and is well adapted to cotton, oats, and vegetables. The other important crops of this region are corn, wheat, sweet potatoes, Irish potatoes, rye, barley, pease, melons, etc. Cotton occupies one-third of the cultivated portion of this soil. Good stands of cotton are obtained, and the soil is earlier and endures drought better than the prairie. The cotton-plant grows from 4 to 5 feet high, but is more productive at 4 feet. It inclines to run to weed in wet weather, the remedy for which consists in dwarfing the plant by deep, close plowing, so as to cut off side roots. On fresh land the seed-cotton product per acre is from 800 to 900 pounds, and 1,650 pounds make a 475-pound bale of lint, which rates in market as middling or good middling. After ten years' cultivation the product is from 700 to 800 pounds, and 1,550 pounds make a bale. The staple from old land is shorter in dry seasons, but the same in wet seasons as from fresh land. The most troublesome weed is crab-grass. None of this land lies "turned out". The soil on slopes washes and gullies readily, but no serious damage is yet done, and no efforts have been made to check the washings, which greatly benefit the lower lands.

The *black waxy prairies*, covering one-half of the county, usually suffer from drought. They have a hard and close soil, and are late, cold, and difficult to till. They produce about 800 pounds of seed-cotton per acre.

Cotton is shipped by rail as fast as baled to Galveston at \$4, or to Saint Louis and New Orleans at \$4 75.

RAINS.

Population: 3,035.—White, 2,785; colored, 250.

Area: 270 square miles.—Woodland, greater part; oak, hickory, and pine region, 200 square miles; central black prairie region, 70 square miles.

Tilled lands: 16,137 acres.—Area planted in cotton, 4,399 acres; in corn, 5,477 acres; in oats, 1,055 acres; in wheat, 553 acres.

Cotton production: 1,915 bales; average cotton product per acre, 0.44 bale, 660 pounds seed-cotton, or 220 pounds cotton lint.

Rains county has a rolling surface, well timbered with oak and hickory, and is bounded on the south by the Sabine river. The Lake fork of the river flows eastward in the northern part of the county.

The uplands are mostly sandy, with clayey subsoils, and are interspersed on the west with the brown loam and black prairies that occur along the eastern border of the central black prairie region.

The bottom lands of the river are heavy and stiff waxy clays, heavily timbered with ash, walnut, white oak, etc. They are very difficult to till, somewhat liable to overflow, and are not much under cultivation. The uplands are easily tilled, and yield from 700 to 800 pounds of seed-cotton per acre, the average for 1879 being greater than that of the state at large.

Nearly one-tenth of the county area is under cultivation, the average being 59.7 acres per square mile. Of this latter 16.3 acres are devoted to the culture of cotton. The crops of the county are corn, cotton, oats, wheat, potatoes, etc., the first having the largest acreage, and yielding from 12 to 15 bushels per acre. The methods of cotton culture, improvement of lands, etc., are the same as described in the adjoining counties.

Cotton is shipped by wagon to the nearest railroad station, and thence to markets, or is sold to local buyers.

WOOD.

Population: 11,212.—White, 8,653; colored, 2,559.

Area: 700 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 48,786 acres.—Area planted in cotton, 15,486 acres; in corn, 18,635 acres; in oats, 2,801 acres; in wheat, 2,282 acres.

Cotton production: 7,381 bales; average cotton product per acre, 0.48 bale, 720 pounds seed-cotton, or 240 pounds cotton lint.

Wood county lies on the north side of the Sabine river, and is watered by its tributaries, except on the extreme north, where the streams flow northeast and form Big Cypress creek.

The surface of the country is quite level and well timbered, embracing several kinds of land. On the east the soil is gray and sandy, with yellow sandy subsoil, the short-leaf pine being the most prominent growth. On the north there are areas of red or chocolate-colored sandy lands, with clay subsoils, and this is said to be the best farming section of the county. (See analyses, page 26.) Sabine river, on the south, has wide bottom lands of stiff waxy clays, heavily timbered, and subject to overflow. There are second bottom lands in some localities, covered with a dense cane growth, that are above overflow and very productive.

These river lands are bordered on the east by a belt of level uplands of unproductive lands known as glades. They consist of a fine silty, impervious material, of much depth, in whose depressions ponds of water stand for a large part of the year. They have a timber growth chiefly of post oak. This belt is from 10 to 100 yards in width, and extends from 15 to 20 miles along the river. The uplands of this part of the county are level and covered with a deep sandy soil, and have a timber growth of post, red, and black-jack oaks, hickory, and sumac.

Wood is an agricultural county, and 10.9 per cent. of its area is under cultivation, with an average of 69.7 acres per square miles; of the latter 22.1 acres are devoted to the culture of cotton.

The average yield per acre in seed-cotton for the county was in 1879 much greater than that for the state at large.

ABSTRACT FROM THE REPORT OF J. H. NEWSOM, OF MINEOLA.

The lands devoted to the cultivation of cotton comprise the light gray ashy soil and a dark loam of the second bottom of the creeks, red gravelly loam mostly on the divides or high lands, and the coarse white sandy soils.

About two-thirds of the surface of the county is covered by a *light gray ashy soil*. It has a depth of 18 inches, and is underlaid by a yellowish clay. This bakes when turned up wet and exposed to the sun, but if stirred up when moist it becomes like the surface soil. It contains some pebbles and white gravel. The natural growth of this land is hickory, smooth-leaf black-jack, and thin-bark post oaks. It is early and warm when well drained, and not difficult to cultivate, being best adapted to cotton, though producing cotton, corn, and oats. About four-tenths of the land is devoted to the first named, which grows to a height of from 3 to 8 feet, being most productive at 4 feet. Topping is the remedy applied to restrain the plant from running to weed, which happens in June and July, when the season is very wet. The yield of seed-cotton per acre is, when the land is fresh, 1,600 pounds; three years' cultivation reduces this product to 1,200 pounds, and the staple is not quite as good; 1,775 pounds from fresh and 1,550 from old lands make 475 pounds of lint. Crab-grass, associated with lamb's-quarter and careless- and rag-weeds, gives much trouble. About 5 per cent. of this land now lies "turned out", but it is almost as good as fresh when again taken in. The washing from the slopes is prevented to some extent by hillside ditching and by underdraining.

The *red lands* have a growth of black-jack and rough hickory and a depth of 1 foot, and are underlaid by lighter subsoil, free from gravel, overlying red sandstone at 4 feet. These lands constitute about one-sixth of the cultivated lands of the county, and are early, warm, well drained, and easily cultivated. The soil is best adapted to corn and wheat, though one-third of the crops consists of cotton. This grows to a height of 4 feet, yielding 2,000 pounds of seed-cotton when the land is fresh and 1,600 pounds after three years' cultivation, 1,650 pounds being requisite for a 475-pound bale. The staple from old land rates better than that from fresh, the amount then needed for 475 pounds of lint being 1,600 pounds. The most troublesome weeds on this soil are cocklebur and lamb's-quarter. The land washes readily, doing serious damage to the slopes, but not to the valleys.

The *coarse, white, sandy soils* have a growth of red-leaf black-jack, blue-jack, and post oak, and grape-vines, and a depth of 10 feet. The subsoil is heavier, and is mixed with a yellow clay. The soil is late, cold, and well drained. It is best adapted to oats, pease, and watermelons, very little cotton being produced. Twelve hundred pounds of seed-cotton per acre may be obtained when the land is fresh, and 500 after three years' cultivation, 1,550 pounds from fresh and 1,300 from old lands being needed for 475 pounds of lint, the staple remaining the same. Owing to the above decrease in the yield after cultivation one-half of the land lies "turned out". The most troublesome weeds are bear-grass, yellow-bloom, mullen, and bull-nettle.

The uplands are generally preferred to the lowlands, because on the latter there is a greater tendency of the cotton-plant to run to weed, thus causing rot in the bottom fruit; also, the worm attacks the bottom lands first. The timber growth on bottoms is white hickory, walnut, cherry, etc.

Shipments are made, as soon as the cotton is baled, by rail from Mineola to New York, freight being \$5 75 per bale.

CAMP.

Population: 5,931.—White, 3,085; colored, 2,846.

Area: 200 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 33,257 acres.—Area planted in cotton, 11,473 acres; in corn, 11,369 acres; in oats, 1,544 acres; in wheat, 824 acres.

Cotton production: 5,689 bales; average cotton product per acre, 0.50 bale, 750 pounds seed-cotton, or 250 pounds cotton lint.

Camp is one of the smallest counties in the state. Its surface is rolling and well timbered with oak, short-leaf pine, and some hickory. It is watered by Big Cypress creek and small tributaries flowing east into Caddo lake, on the Louisiana line.

The lands are a sandy loam, dark from decayed vegetation, and having red and yellow subsoils more or less sandy. The county is well populated, and a little more than a fourth of its area is under cultivation. Of the latter 57.4 acres are devoted to the culture of cotton. But three counties surpass it in cotton acreage per square mile, Washington, Fayette, and Johnson. The crops of the county are cotton, corn, oats, cane, etc. The lands are

easily tilled and produce well, yielding from 750 to 900 pounds of seed-cotton, 15 to 20 bushels of corn, or 18 to 20 bushels of oats per acre. That of cotton for 1879 was much greater than the average for the state. The methods of culture do not differ materially from those in practice in the adjoining counties.

The railroads afford easy transportation to markets, though the cotton is mostly sold to local buyers.

MARION.

Population: 10,983.—White, 3,759; colored, 7,224.

Area: 420 square miles.—Woodland all; all oak, hickory, and pine region.

Tilled lands: 36,978 acres.—Area planted in cotton, 17,102 acres; in corn, 13,554 acres; in oats, 565 acres; in wheat, 13 acres.

Cotton production: 7,515 bales; average cotton product per acre, 0.44 bale, 660 pounds seed-cotton, or 220 pounds cotton lint.

The county of Marion borders Louisiana on the east. Its surface is rolling, and is well timbered with short-leaf pine, oak, and hickory. The bottom lands of the streams, and those that border Caddo lake, have a timber growth of cypress, ash, walnut, cedar, etc.

Iron ore occurs in some of the hills, and furnaces were at one time erected for its reduction. The lands of the county comprise the dark sandy loams of the lowlands and the gray sandy soils of the uplands, interspersed with large bodies of red land, derived from iron ore and ferruginous sandstone. The subsoils of most of the soils consist of red or yellow clays, more or less sandy, and at depths of from 6 to 10 inches from the surface. The lands of the bottoms yield from 1,000 to 1,200 pounds of seed-cotton per acre. Those under cultivation comprise 13.8 per cent. of the county area, and average 88 acres per square mile. They are easily tilled, and produce good crops of corn, oats, cotton, sugar-cane, potatoes, fruits, and vegetables. Cotton is the chief crop of the county, with an average of 40.7 acres per square mile, or 46.2 per cent. of the tilled lands, and an average yield in good seasons of from 600 to 800 pounds in the seed per acre. Its yield for the dry year of 1879 was 660 pounds.

Jefferson, the county-seat, affords a market for cotton, whence it is shipped by rail to Saint Louis, Houston, or Galveston, or by boat to Shreveport and New Orleans.

UPSHUR.

Population: 10,266.—White, 6,884; colored, 3,382.

Area: 520 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 58,063 acres.—Area planted in cotton, 19,418 acres; in corn, 20,728 acres; in oats, 2,517 acres; in wheat, 1,425 acres.

Cotton production: 8,023 bales; average cotton product per acre, 0.41 bale, 615 pounds seed-cotton, or 205 pounds cotton lint.

The surface of Upshur county is rolling and well timbered, and is watered by the Sabine river on the south and by other streams that flow eastward into Caddo lake. Tertiary iron ores and sandstones occur in some parts of the county, forming a part of the belt that passes southwest toward San Antonio. Two ranges of hills, separated by the waters of Little Cypress creek, a tributary of Caddo lake, are said to extend from the center to the boundary-line of Harrison county. The soils of the upland are mostly gray sandy loams, interspersed with red sandy lands, and underlaid by reddish clays. Their timber growth is principally red, black, and black-jack oaks, hickory, and short-leaf pine. The bottom lands consist of loamy soils, black with decayed vegetation, very fertile, and having a heavy timber growth of walnut, elm, pin oak, and sweet gum. The uplands seem to be preferred for cotton, because of the greater ease in tillage and the more rapid maturity of the crop.

The tilled lands of the county comprise about 17.4 per cent. of its area, or 111.7 acres per square mile, and of this about one-third, or an average of 37.3 acres per square mile, is devoted to cotton culture. The yield per acre of this crop is a little over the average for the state. Corn is the chief crop of the county, and yields an average of from 12 to 15 bushels per acre; wheat, 7 to 10 bushels per acre.

ABSTRACT FROM THE REPORT OF J. M. GLASCO, OF GILMER.

The surface of the county is rolling, and is covered with a growth of pine, red, black, black-jack, and post oaks, and hickory. The only soil fit for cultivation is a *dark fine sandy loam*, 18 inches deep, underlaid by a dark red clay, changing to a light red. Under this at from 10 to 20 feet is a clay stratum impervious to water. These sandy uplands cover about two-thirds of the county, the rest being low hills, with stiff unproductive land, called "clay-galls". The chief crops of the county are corn, cotton, oats, sweet potatoes, and pease. About one-half of the land under cultivation is devoted to cotton. Its usual height is 3½ feet, running to weed when the season is showery and warm without heavy rains. Topping and close plowing are the remedies applied to restrain it. The product of seed-cotton per acre from fresh land is 1,000 pounds, 1,500 pounds making 475 pounds of lint, which rates as low middling. Eight years cultivation reduces the yield to 600 pounds per acre, the staple then rating as good ordinary. Crab-grass is the only weed that occasions trouble. No land lies "turned out"; it washes readily on slopes, doing serious damage unless care is taken to prevent it. Saint Louis is the usual shipping point, to which the cotton is sent in December and January, the rate being \$4 50 per bale.

GREGG.

Population: 8,530.—White, 3,817; colored, 4,713.

Area: 280 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 38,585 acres.—Area planted in cotton, 13,767 acres; in corn, 13,411 acres; in oats, 827 acres; in wheat, 22 acres.

Cotton production: 4,590 bales; average cotton product per acre, 0.33 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

The surface of Gregg county is rolling, and is well timbered with short-leaf pine and oak on the uplands and sweet gum, walnut, ash, white oak, etc., on the streams. Sabine river flows with an easterly course through the southern part of the county, and has but a few small tributaries.

The lands of the uplands are gray and sandy, with red and yellow sandy and clayey subsoils. They are easily tilled, and produce an average of from 500 to 700 pounds of seed-cotton per acre. Their pine growth is largely utilized for lumber by the many saw-mills of the county.

The bottoms of the Sabine river are a stiff, waxy clay soil, very difficult to till, heavily timbered, and mostly subject to overflow.

The lands of the county under cultivation comprise 21.5 per cent. of its area, an average of 137.8 acres per square mile, the principal crops being cotton, corn, oats, vegetables, etc. Cotton has the largest acreage, the average being 49.2 per square mile, or 35.7 per cent. of the tilled lands.

The methods of culture, etc., do not differ materially from those used in the adjoining counties.

Shipments are made by railroad to the north or south.

HARRISON.

Population: 25,177.—White, 7,976; colored, 17,201.

Area: 900 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 126,462 acres.—Area planted in cotton, 46,614 acres; in corn, 38,808 acres; in oats, 765 acres; in wheat, 18 acres.

Cotton production: 17,619 bales; average cotton product per acre, 0.38 bale, 570 pounds seed-cotton, or 190 pounds cotton lint.

The surface of Harrison county is rather rolling, and in some places broken. On the south it is watered by Sabine river and its small tributaries, while on the north a number of streams flow into Caddo lake.

The soils of the county are mostly gray sandy loams, varied occasionally with red and gravelly lands, and well timbered with post, red, and black-jack oaks, hickory, and short-leaf pine. The subsoils are sometimes heavy red clays, though more generally a yellowish sand.

Sandstones and brown coals or lignites are reported as underlying the lands of the county at depths of from 20 to 40 feet.

The bottom lands of Little Cypress creek and Caddo lake are said to be from 2 to 3 miles wide, and are mostly marshes, on which water stands for half of the year. Their soils are black and stiff, and they have a timber growth of pin and overcup oaks, short-leaf pine, and cypress. Along the borders of the lake are found "blue-jack" oaks and myrtle thickets.

The uplands of the county are the chief cotton lands, and a yield of 800 pounds of seed-cotton per acre is claimed for them. In fair seasons and with proper cultivation this is probably correct, as the average yield for the entire county in the droughty year of 1879 was 570 pounds, an average much below that of the adjoining counties for the same year. Harrison is principally an agricultural county, nearly 22 per cent. of its area, or 140.5 acres per square mile, being under tillage. The crops consist of corn, cotton, small grain, tobacco, vegetables, fruits, and grapes. Cotton is the chief of these, its acreage comprising 36.9 per cent. of the lands under cultivation, and averaging 51.8 acres per square mile, a number exceeded by only seven counties in the state.

ABSTRACTS FROM THE REPORTS OF W. T. WARE AND H. V. SENTELL, OF JEFFERSON, W. J. CAVEN, OF MARSHALL, AND THOMAS STEELE, OF ELYSIAN FIELDS.

When the lowlands or river and creek bottoms are well drained they are preferred for cotton, because they endure drought better and produce more per acre. They are, however, generally late, cold, and ill drained, and far more expensive to reduce to a tillable state than is the case with uplands. Cotton on the lowlands is also liable to be prematurely frost-killed. The uplands are therefore preferred, and they produce abundant returns for the labor bestowed upon them. The climate here is well suited to cotton production.

The uplands vary from level to broken, and from red gravelly to gray soils of varying depths, and occur in available spots of from 10 to 50 acres. The chief soils cultivated in cotton are the uplands; next to these are the creek bottoms, the lower and broader bottoms of the larger streams being overflowed much of the time.

The *gray sandy lands*, lying mostly in the northern part of the county, have a natural growth of pine, post, red, black-jack, and black oaks, and hickory. The soil is a fine gray sandy loam from 1 foot to 2 feet in depth. The subsoil in some places is red clay, in others a mixture of red and yellow clay, and sometimes yellow sand; and where clay is the subsoil sand is found at from 10 to 40 feet, replaced sometimes by a variety of lignite. The land is easy to till at all times, and is early, warm, and well drained.

Cotton and corn, some oats, pease, and potatoes constitute the chief crops of the county, the soil being best adapted to cotton, which occupies about two-thirds of the tillable area, the plant averaging about 4 feet in height; on fresh land from 5 to 7 feet is attained. The most productive height is from 2½ to 3 feet, as there are then more bolls in proportion to the height. In excessive wet seasons there is a tendency of the plant to run to weed; also, when closely crowded in drills and rows. In the former case topping and good cultivation are the remedies resorted to to restrain the running to weed; in the latter case, allowing greater distance between the rows and keeping the land well drained. On fresh land the product per acre in seed-cotton is from 1,000 to 1,200 pounds; after ten years' cultivation, where the land is level, 800 pounds; where rolling, 600 pounds, and from 400 to 600 pounds after the land has been under cultivation for thirty-five years. The rating of the staple from fresh land is from good middling to fair, that from old land being one grade lower, the fiber being shorter. The seed is smaller on old land. Crab-grass and cockleburrs are the most troublesome weeds of any importance. From 15 to 33 per cent. of the land lies "turned out", growing up in scrub or old-field pine and persimmon. It is improved by rest, and sometimes produces as much as 700 or 800 pounds per acre, especially when not badly washed. The soil washes to some extent, doing serious damage in some places. Low marshy valleys are very greatly improved by the washings, sometimes doubling their original value. In some places the valleys are injured as much as 15 or 20 per cent. No appreciable efforts have been made to prevent the washing of the soil, and the ditches soon fill up with sand.

The *red gravelly lands* have a natural timber growth of red, post, white, and black-jack oaks, hickory, persimmon, walnut, buckeye, and numerous other varieties. The soil is a heavy gravelly clay loam, about 6 inches deep, with a heavier subsoil, mixed with sand in

places; also found very stiff and almost impervious in others. The subsoil contains hard "black gravel", and is underlaid by sand, gravel, and rock at a depth of from 1 foot to 5 feet. In wet seasons there is no difficulty in tillage, but when seasons are dry it becomes hard. The soil is best adapted to cotton, which occupies one-half the cultivated area. Corn is also quite productive on fresh land, which often yields as much as 25 bushels per acre. Cotton is usually from 3 to 4 feet in height, producing best at about 3 feet. The plant inclines to run to weed if too closely crowded in drills and rows, and if the soil is too wet this may be remedied by giving a greater distance in drill and rows and by keeping the land well drained. The seed-cotton product per acre on fresh soil is from 1,000 to 1,200 pounds. The lint rates as good middling. After ten years' cultivation the seed-cotton product per acre is from 800 to 900 pounds, about 1,355 pounds then making a 475-pound bale of lint, and the staple is shorter and seed not so large as that from fresh land. Crab-grass is the most troublesome weed on this soil. About one-tenth of such land originally cultivated now lies "turned out", and where the top soil has not been entirely washed off it makes fair crops. The soil washes and gullies readily on the slopes, and in places is injured, and the valleys are sometimes injured to the extent of perhaps 10 per cent. Very little has been done to check this damage, but the success was good as long as it was practiced.

The soil of bottoms of creeks and smaller streams is a blackish clayey loam, having an average of 24 inches in depth, and resting upon a subsoil in various places of blue, yellowish, light brown, and red clays, adhesive, close, and impervious when undisturbed, and free from rock of any kind. Tillage is difficult in wet seasons, but easy in dry if well broken before the ground is too dry. This soil covers about an eighth of the county, and bears a natural growth of white, red, water, post, and pin oaks, sweet and black gums, bitter pecan, hickory, red elm, chinocapin, maple, and papaw. The greater part of such soil is late, cold, and ill drained. When well drained, it is well adapted to growing corn, cotton, and sugar-cane. Cotton is planted on two-thirds of the cultivated part of this land. The usual height attained by the plant is from 6 to 8 feet, but it is most productive at from 5 to 6 feet. (The inclination to weed and the remedy are as on soil first described.) The seed-cotton product per acre is 1,500 pounds, about 1,435 pounds being required for a 475-pound bale of lint rating as strictly good middling. After ten years' cultivation the product varies from 1,300 to 1,500 pounds, 1,425 pounds then making a bale of 475 pounds; the staple is very little shorter and the seed is smaller. The troublesome weeds are crab-grass and cocklebur, the latter growing very rapidly. None of this land lies "turned out" for the usual cause, but some parts are sometimes abandoned because they are flooded, and these floodings sometimes damage fields by leaving deposits of sand.

The bottom lands of the lake and larger streams are from 2 to 3 miles wide, and have a growth of pin and overcup oaks, pine, and cypress in the marshes, and blue-jack and myrtle thickets along the borders of Caddo lake. The soil is partly a black, stiff clay loam, very little of which is cultivated, being under water half the year. There are spots of from 1 acre to 10 acres each of blackish, sandy land, more or less wet, which has been drained and leveed, and is fine for cultivation. The soil has a depth of about 10 feet, with a clay subsoil, and is best adapted to cotton. The yield is from 700 to 800 pounds of seed-cotton per acre, and from 500 to 600 pounds after ten years' cultivation. The most troublesome weeds are crab-grass and bull-nettles.

Farmers usually haul their cotton to Jefferson or Shreveport, from whence it is shipped to New Orleans, via Red river, at \$2 per bale.

PANOLA.

Population: 12,219.—White, 7,284; colored, 4,935.

Area: 800 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 71,946 acres.—Area planted in cotton, 28,480 acres; in corn, 27,452 acres; in oats, 1,825 acres; in wheat, 44 acres.

Cotton production: 10,344 bales; average cotton product per acre, 0.36 bale, 540 pounds seed-cotton, or 150 pounds cotton lint.

Panola county is divided into two parts by the Sabine river, which flows in an irregular southeast course. Its surface is gently rolling or undulating and well drained by numerous small streams tributary to the river. The lands are mostly gray sandy loam soils on the uplands, with yellowish and red clayey subsoils, and are well timbered with short-leaf pine, oak, and hickory, the former predominating. Extensive long-leaf pineries occur in the county, interspersed with hard timber growth.

The bottoms have a stiff black soil and subsoil and a growth of ash, elm, sweet gum, walnut, cypress, and magnolia. They are more or less subject to overflow, and are not much under cultivation.

The tilled lands of the county comprise about 14.1 per cent. of its area, or 89.9 acres per square mile, and of all the crops corn has the largest acreage, and has an average yield of 7 bushels per acre; wheat, 10 bushels. The cotton acreage is 39.6 per cent. of the tilled lands, or an average of 35.6 acres per square mile.

The river is navigable for small boats during a part of the year, and shipments can be made south to Beaumont, and thence either by boat or railroad to New Orleans or Galveston.

ABSTRACT FROM THE REPORT OF H. FYKE, OF CARTHAGE.

The uplands are rather undulating, comprising both level and rolling lands. The greater part of the agricultural region is composed of a light gray, fine sandy loam, 8 inches deep, overlying a yellowish, leachy, clayey subsoil. The natural growth is red, post, and black oaks, hickory, and pine. The soil is late, warm, well drained, and easily cultivated at all times. The chief productions are cotton and corn, the former being best adapted to the soil. About three-fifths of the crops is in cotton, which usually attains a height of 3½ feet, too much moisture tending to cause it to run to weed. When the land is fresh, 800 pounds of seed-cotton can be produced per acre; 500 pounds after sixteen years' cultivation. The lint rates as good middling, the rating of the staple from old land being one grade lower. The most troublesome weed is crab-grass. There is not enough land "turned out" to be estimated. The soil washes to some extent, but occasions no serious damage.

Cotton is sold to local merchants.

RUSK.

Population: 18,986.—White, 10,807; colored, 8,179.

Area: 920 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 99,714 acres.—Area planted in cotton, 38,326 acres; in corn, 39,744 acres; in oats, 2,965 acres; in wheat, 123 acres.

Cotton production: 11,145 bales.—Average cotton product per acre, 0.29 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

The surface of Rusk county is rolling and hilly, and is well timbered with oak, hickory, and short-leaf pine. The mast, which is very abundant, serves largely for food for hogs.

On the north the county is watered by the tributaries of the Sabine river, while on the south the small streams flow into the Angelina river.

The soils are gray, sandy, and more or less gravelly, interspersed with bodies of red clay lands, all having a red or yellowish clay subsoil. Some of the hills have large deposits of Tertiary iron ores and sandstones, and a good quality of lignite or brown coal is reported as occurring 10 feet below the surface near Henderson, the county-seat.

Rusk is an agricultural county chiefly, its tilled lands comprising about 16.9 per cent. of its entire area, or 108.4 acres per square mile, while corn has a larger acreage than any other crop. Cotton ranks next, with an average of 41.7 acres per square mile, or 38.4 per cent. of the lands under cultivation. There are only 13 counties in the state having each a greater cotton acreage in proportion to its area. Its product per acre for 1879 was very small, 435 pounds of seed-cotton.

ABSTRACTS FROM THE REPORTS OF C. B. RICHARDSON, OF HENDERSON, AND J. D. WOODWARD, M. D., OF OVERTON.

The soils of the county comprise gray and red sandy uplands and the dark first and second bottom of the streams.

The *light, fine sandy, gray loam* covers about half the area of the uplands, and lies chiefly in the northeastern half of the county. Its chief natural growth is white, red, post, and black-jack oaks, pine, chincapin, dogwood, and gum. The soil is from 12 to 18 inches thick, and has a subsoil of hard yellow clay, which stands in the wall of a well without curbing of any kind. It is further underlaid in the vicinity of Henderson by potter's clay, and still further by sand at 18 feet in some localities. Tillage is easy in all seasons, and the soil is early, warm, and well drained. The chief crops of this region are cotton, corn, small cereals, Irish and sweet potatoes, sugar-cane, pease, and a great variety of fruits and vegetables. All succeed well on this soil, but about one-half its cultivated area is planted in cotton. The usual and most productive height attained by the plant is $3\frac{1}{2}$ feet. If planted late, it is inclined to run to weed in wet seasons, the remedy for which consists in planting early and throwing dirt from the row when wet periods begin. The seed-cotton product per acre varies from 800 to 1,200 pounds, from 1,425 to 1,485 pounds making a 475-pound bale of middling to good middling lint. After five years' cultivation (unmanured) the product varies from 600 to 1,000 pounds, the ratio of seed to lint and the quality of staple, which depends upon the manner of handling, being about the same. Crab-grass and cockleburrs are the most troublesome. In 1865 one-third of this land lay "turned out"; it is now all fenced, and new land in addition. Land lying out does not improve when closely grazed, but does if kept under fence. Slopes are damaged to a serious extent by washing and gulying. In some cases the washings carried down upon the lowlands damage them to the extent of from one-third to one-half their value. New land is so cheap that very little effort is made to save the old; it is customary, however, to make hillside rows horizontal.

The *yellow and orange red gravelly loam*, chiefly in the southwestern half of the county, is 15 inches deep. This soil is more difficult to cultivate in wet seasons, and endures cultivation longer. In all other details it is like the soil last described.

The soil of the *bottom lands* of the Sabine river and creeks includes about one-fourth of the county area. Its natural growth is white, red, post, and overcup oaks, hickory, ash, maple, and muscadine vines. The soil is a fine, sandy, gray and blackish loam, 18 inches deep, underlaid by a compact yellow clay subsoil. Tillage is easy in dry but difficult in wet seasons, and the soil is late, cold, and ill drained in its natural condition. It is apparently best adapted to corn and cotton, and one-half of its improved area is planted in cotton. The usual and most productive height of the plant is 4 feet. The seed-cotton product per acre of fresh land is 1,200 pounds, or 1,100 pounds after five years' cultivation. This soil deteriorates less rapidly than the others mentioned, and sometimes such land is damaged by the washing away of the banks of creeks, or by the deposit of washings from overflowing waters. Straightening of the creek beds by cutting large ditches has been a successful remedy. Bur- and crab-grass are the most troublesome weeds.

Warm, dry springs are favorable, and wet, cool springs and hot, dry weather in July and August are disastrous to both corn and cotton crops.

Cotton is shipped, when baled to Houston, at \$3 75 per bale, or to Galveston, New Orleans, or Saint Louis at \$4 50.

SMITH.

Population: 21,863.—White, 11,506; colored, 10,357.

Area: 960 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 120,916 acres.—Area planted in cotton, 45,703 acres; in corn, 43,631 acres; in oats, 4,633 acres; in wheat, 589 acres.

Cotton production: 16,285 bales; average cotton product per acre, 0.36 bale, 540 pounds seed-cotton, or 180 pounds cotton lint.

Smith county is watered on the north by the Sabine river and a few small tributaries, and on the west and south by the headwaters of the Neches and Angelina rivers. Its surface is rolling and somewhat hilly, and is well timbered with oak, hickory, and short-leaf pine. Tyler, the county-seat, is situated in a valley between parallel chains of iron-ore hills on the east and west that are distant about 12 miles from each other, and have a northeast and southwest trend. There are several large salines on the north and southwest of Tyler that during the late civil war furnished large quantities of salt. Limestone is reported near them, and is probably of Cretaceous age.

The uplands of the county vary from gray to red sandy or clayey loams, are easily tilled, and produce from 550 to 700 pounds of seed-cotton per acre. The sandy soils are best suited to cotton, the red and mulatto to grain. (See analyses, page 26.) The bottom lands of the river are stiff and waxy in character, and, while highly productive, are very difficult to till, and are not much under cultivation, being also more or less subject to overflow. They are heavily timbered with ash, walnut, oak, etc.

Smith is an agricultural county, 19.7 per cent. of its area being under cultivation, the average being 126 acres per square mile. The principal crops are corn, cotton, oats, wheat, rye, etc., with a yield of from 12 to 18 bushels of corn and from 15 to 20 bushels of oats. Cotton is the chief crop, its acreage per square mile being 47.6, or 37.8 per cent. of the tilled lands.

The methods of cotton culture and the improvement and tillage of the lands are the same as those of the counties above described.

The county is connected by railroad with each of the two great railway trunk lines from the cities on the west and south to northern markets.

VAN ZANDT.

Population: 12,619.—White, 11,456; colored, 1,163.

Area: 840 square miles.—Woodland, about three-fourths; oak, hickory, and pine region, 650 square miles; central black prairie, 150 square miles; brown-loam prairie region, 40 square miles.

Tilled lands: 62,597 acres.—Area planted in cotton, 17,579 acres; in corn, 21,635 acres; in oats, 4,034 acres; in wheat, 1,506 acres.

Cotton production: 6,957 bales; average cotton product per acre, 0.40 bale, 600 pounds seed-cotton, or 200 pounds cotton lint.

Van Zandt county lies on the border between the central black prairie region and the timbered uplands of the eastern part of the state. That portion lying west of Wills' Point is included in the belt of brown-loam prairies (or intermixture of brown-loam and black prairie) that is found between the two regions. Mesquite is a prominent growth. The remainder and largest part of the county is covered with a timber growth of oak, hickory, and some short-leaf pine; its surface is somewhat rolling, and its soil a light gray sandy loam with a yellowish clay subsoil.

Near Grand Saline, on the northeast, the country is hilly, with an abundance of concretionary iron-ore nodules (which shale off on their surface) and underlying strata of light sands and micaceous clays having salt incrustations. Jordan's saline is said to cover several hundred acres, and to have yielded at one time a thousand sacks of salt daily. The water is obtained at a depth of 18 feet.

The county is watered on the north by the tributaries of the Sabine, which river forms the northeast boundary, by those of the Neches on the southeast, and by those of the Trinity on the southwest.

While the county is chiefly an agricultural one, nearly if not fully four-fifths of its lands are as yet undisturbed. Corn is the chief crop, cotton averaging 20.9 acres per square mile, or 28.1 per cent. of the tilled lands.

ABSTRACT FROM THE REPORT OF G. J. CLOUGH, OF BEN WHEELER.

The uplands of this county, consisting partly of rolling and in part of level lands, are considered very well adapted to the growth of cotton. The only cotton-producing soil of any importance is the sandy land of the uplands and second bottom. The depth is 3 feet, and the natural growth oak, hickory, and pine. They cover the greater part of the county.

The crops grown are cotton, corn, oats, wheat, and sugar-cane; but cotton, which constitutes one-third of the crops grown, seems best adapted to the soil. It varies in height from 2½ to 5 feet, being most productive at 3 feet, but tends to run to weed in wet seasons, which can be restrained by close plowing when growing too fast. From 1,000 to 1,400 pounds of seed-cotton per acre can be produced on fresh land; 1,600 pounds are needed for a 475-pound bale, the lint of which rates as strict middling. After several years' cultivation the yield is diminished and the rating lowered. Crab-grass is the most injurious weed. No land lies "turned out". To prevent the washing of the soil horizontalizing and hillside ditching are practiced, and are attended with good results.

Cotton is shipped by wagon to Wills' Point at \$2 per bale, the time depending on the price of the staple.

KAUFMAN.

(See "Central black prairie region".)

HENDERSON.

Population: 9,735.—White, 7,641; colored, 2,094.

Area: 960 square miles.—Woodland, greater part; oak, hickory, and pine region, 870 square miles; black prairie region, 20 square miles; brown-loam prairie region, 70 square miles.

Tilled lands: 48,641 acres.—Area planted in cotton, 15,763 acres; in corn, 18,607 acres; in oats, 2,490 acres; in wheat, 179 acres.

Cotton production: 6,159 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

Henderson county lies between the Neches and Trinity rivers, the dividing upland passing in a southeast course through near the center. The surface of the county is slightly rolling, and is very generally timbered with the oak and hickory growth of the region. The soil of the uplands is a light sandy loam with a clayey subsoil, and is interspersed in some parts of the county with red lands and deep sands.

The bottom lands of the streams are narrow, but with their dark soils, rich in decayed vegetation, seem to be preferred for tillage. They have a timber growth of ash, elm, pecan, hackberry, etc.

The county is not as well populated as the others of this region, and its tilled lands comprise only 7.9 per cent. of the county area, and average 50.7 acres per square mile. Of these 16.4 acres (or 32.4 per cent.) are devoted to the culture of cotton. Corn is the chief crop, and yields from 10 to 20 bushels per acre.

ABSTRACT FROM THE REPORT OF N. P. COLEMAN, OF ATHENS.

The soils comprise the dark sandy land, lying mostly on slopes; the light sandy and mulatto, covering one-half of the surface of the county, and forming the soil of the slightly rolling uplands; and the very deep light sandy land. The best soil as regards the cultivation of cotton is the dark sandy second bottom, which forms a very small portion of the tillable area. The light sandy mulatto, the next in importance, is the most largely cultivated. The timber of the bottom lands is oak, ash, hickory, gum, elm, etc.

The soil of the *uplands* is fine and sandy, dark gray to mulatto in color, from 6 inches to 2 feet in depth, with a yellow-clay subsoil impervious to water; that of the red lands contains soft red ironstone pebbles. It is early, warm, well drained, and easily cultivated, producing corn and cotton; but it is best adapted to the latter, which varies in height from 2½ to 5 feet, seldom growing to weed. The yield of seed-cotton per acre is from 800 to 1,200 pounds, 1,485 pounds being required for 475 pounds of lint, which rates as low middling. The

plant on the lowlands inclines to run to weed in wet seasons, for which no remedy is applied. About one-third of the land is devoted to cotton, to the successful raising of which drought is the great obstacle. The most troublesome weeds are crab-grass, lamb's-quarter, and careless-weed. Late crops are occasionally damaged by the army-worm, and during protracted wet seasons by the boll-worm. Very little land lies "turned out", but the rest which it thus has is very beneficial, as is shown by the yield when the land is again cultivated. The soil on the slopes washes quite readily, doing, in some instances, serious damage, especially when neglected. Hillside ditching, when effectually accomplished, is attended with satisfactory results.

Cotton is shipped, when the price suits, to Palestine by wagon, and thence by rail to Galveston. Rate of freight is \$3 75 per bale.

NAVARRO.

Population: 21,702.—White, 16,356; colored, 5,346.

Area: 1,040 square miles.—Woodland, small part; oak, hickory, and pine region, 150 square miles; central black prairie region, 240 square miles; brown-loam prairie region, 650 square miles.

Tilled lands: 136,099 acres.—Area planted in cotton, 45,716 acres; in corn, 40,133 acres; in oats, 4,288 acres; in wheat, 2,872 acres.

Cotton production: 12,958 bales; average cotton product per acre, 0.28 bale, 420 pounds seed-cotton, or 140 pounds cotton lint.

Navarro county is bounded on the east by the Trinity river, into which flow Chambers and Richland creeks, with their numerous tributaries.

The surface of the county is almost entirely an open prairie, with the exception of narrow timbered areas along some of the streams and a large region on the east, which are timbered with a growth of post and black-jack oaks and hickory. These latter lands have usually gray sandy soils, with red or yellow clay subsoils, and often extend to the immediate banks of the river, forming high bluffs, in one of which, near Rural Shade, the following section was obtained:

Soil and gravel.....	feet..	4
Sandstone.....	foot..	1
White laminated joint clay with leaf impressions.....	feet..	20
Ferruginous sandstone and lignite.....	inches..	6
Sand.....	feet..	3
Sandstone and a seam of lignite.....	feet..	2
Yellow micaceous sand.....	feet..	10
Thinly-laminated sandstone, exposed above water.....	feet..	3

On the west of these uplands, and occupying the central portion of the county, are broad and almost level brown-loam and sandy prairies, with beds of variously colored quartz, pebbles, and stiff clayey subsoils, which resemble in every respect those of the black central prairie region. In the lowlands and flats of this part of the county this subsoil seems to become the soil—a black, waxy, hog-wallow clay, that cracks open in dry seasons and is covered with a mesquite growth. The continuity of these prairies is broken only by the timbered lands of the streams, the belt passing through the county from north to south, and reaching in width several miles west of Corsicana to the black waxy lands of the central prairie region. (See analysis, page 27.) Near Corsicana are found fossiliferous sandstones of the Tertiary, the uplands being apparently the continuation of the more prominent Tehuacana hills of Limestone county on the south.

The black, waxy, central prairie lands cover all of the western part of the county, are level, somewhat sandy, and underlaid by the soft rotten limestone of the Cretaceous.

Navarro is one of the principal agricultural counties of the state. The lands under cultivation average 130 acres per square mile, or 20.9 per cent. of the county area. One-third of these tilled lands is devoted to the culture of cotton, the chief crop, which has an average of 44 acres per square mile.

ABSTRACTS FROM THE REPORTS OF M. DRANE AND JAMES N. BRACEWELL, OF CORSICANA, AND W. INGRAM, OF RURAL SHADE.

One-half of the area of the county is covered by *black, stiff, clayey soil*, wooded only where it extends into the bottoms of larger streams or along the margins of the creeks passing through it. The timber then consists of ash, elm, pecan, Spanish oak, and hackberry. The soil varies from 2 to 5 feet in depth. The subsoil is a tough, light yellow joint clay down to 15 or 20 feet, and hard-pan farther down to 50 feet. This latter is as impervious to water as are cisterns. The deeper down, the harder and more impervious to water it becomes, but it is productive after being exposed awhile on the surface. The subsoil contains occasionally flinty, rounded, black pebbles and angular fragments of rotten limestone. It is hard to reduce this soil to a state of easy tillage, but after it is done there is no difficulty with it, except when too wet. It is early, warm, generally well drained, and best adapted to corn, wheat, and oats, these, with cotton, barley, sorghum, millet, rye, and Irish and sweet potatoes, constituting the chief crops of the region.

From one-third to two-fifths of this soil is planted in cotton. The plant grows usually 2½ feet high, is most productive at 3, and inclines to run to weed (also on the sandy prairie next described) in wet seasons, which is remedied by topping or plowing and by early "laying by" when the falls are not wet. When the lands are fresh the average product per acre is 500 pounds of seed-cotton, 1,545 pounds making a 475-pound bale of second-rate lint. This soil yields more after six or ten years' cultivation than at first, and it has not been known to decline in cotton yield, which averages from 1,000 to 1,200 pounds per acre. The land having no sand or dust, the staple from it is in better condition than that from other soils. The most troublesome weeds are cocklebur, sunflower, careless-weed, and purslane. Slopes are all prevented from washing by horizontalizing.

Additional abstracts from the reports of Messrs. Drane and Ingram.

Three-eighths of the county area is covered by fine and coarse *sandy, gray and blackish loam prairie land*, which occurs in belts of from 3 to 6 miles wide, reaching across the county in some cases and into the adjoining counties in other cases. Along the borders of the streams there is a growth of post and black-jack oaks and hickory. The soil is from 6 to 24 inches deep, and rests upon a leachy subsoil of clay, varying from red to yellow in different localities, containing hard, rounded; and angular white and black gravel, which inclines to bake, but

gradually becomes like the surface soil when cultivated. It is underlaid by sand at from 10 to 20 feet. Tillage is easy in wet seasons; but in dry seasons the soil is hard, and cuts the implements like a grindstone. The soil is early, warm, well drained, and best adapted first to corn, second to cotton, third to potatoes, and last to small cereals. From one-third to one-half of the cultivated area is planted in cotton. The plant usually grows from 3 to 5 feet high, but is most productive at 3½ or 4 feet. The maximum seed-cotton product per acre of fresh land is 1,500 pounds, the average 550 pounds, and 1,485 pounds make a 475-pound bale of middling lint. After four years' cultivation (unmanured) the average product is from 600 to 700 pounds; after six to ten years, from 500 to 600 pounds; 1,665 pounds then make a 475-pound bale of inferior staple. The troublesome weeds are chiefly crab, nut, and fox-tail grasses. Very little, if any, of this land lies "turned out"; it improves a little if allowed to rest. The soil washes and gullies, seriously damaging steep slopes; but the washings rather improve the valleys. Horizontalizing and hillside ditching have been practiced, and are fairly successful in checking the damage.

The bottom lands of the Trinity river and of Richland, Chambers, and other creeks occupy one-eighth of the county, and have a growth of burr, Spanish, and water oaks, cedar, pecan, elm, ash, and hackberry. The soil of these is a heavy, coarse sandy, gray, blackish, and black loam from 2 to 5 feet thick. The subsoils are clays, some hard-pans, some leachy, and contain hard rounded black and white gravel, underlaid by sand, gravel, and rarely by rock at from 10 to 20 feet. Tillage is easy in dry but difficult in wet seasons, and the soil is late, cold, and ill drained. It is best adapted first to cotton, second to corn, and third to sorghum and ribbon-cane. From one-half to three-fourths of this land is planted in cotton. The plant grows from 4 to 7 feet high, is most productive at 6, and inclines to run to weed when showers are frequent (not necessarily excessive), the remedy consisting in topping and rapid cultivation. The maximum seed-cotton product per acre of fresh land is from 1,500 to 1,800 pounds, the average 800 pounds, 1,545 pounds making a 475-pound bale of first-rate lint. After four years' cultivation, in fair seasons, rather dry for uplands, the average product is from 1,000 to 1,300 pounds, without change in the ratio of seed to lint and in quality of staple. Horse-weeds, sunflowers, burs, etc., are most troublesome. Such land does not lie idle, except when overflowed or when fencing is washed away. Frosts often occur in the vicinity as late as April 20 sufficient to destroy all cotton then above ground. In autumn in the timbered uplands and creek or branch bottoms the cotton is killed much earlier than on the high, rolling prairies, and vegetation is killed later in the spring. The drought generally commences in July, and causes cotton to shed its forms and young bolls to a serious extent in August. This county is north of the usual limit of the caterpillar depredations. Occasionally, however, they strip the plants of their leaves, but this is only in wet seasons, at which time the maturing of the boll is promoted by stripping off the foliage and allowing the sun to strike in upon the bolls, which otherwise would rot from shade and moisture.

According to Mr. Drane, the cotton products of the county for the years 1863 and 1864 were respectively 30 and 40 bales. The present annual export is 20,000 bales. The increase is due chiefly to immigration and to the development of the resources of the county.

Additional abstract from the report of Mr. Ingram.

The light sandy soil of the timbered upland along the streams has a natural growth of post and black-jack oaks and hickory, and is 18 inches deep. The subsoil is a heavy, tough, reddish-yellow clay, containing white gravel and rounded pebbles, and is underlaid by sand. The land is easily tilled, is late and well drained, and about one-half of such land is planted in cotton. The plant usually attains a height of 4 feet, at which it is most productive. The seed-cotton product per acre on fresh land is 1,000 pounds, about 1,550 pounds being necessary for a 475-pound bale of lint, which rates as good ordinary. After four years' cultivation (unmanured) the product per acre is 700 pounds, and 1,550 pounds are required for a 475-pound bale of lint, which is shorter than that raised on fresh land. The most troublesome weeds on this land are cocklebur and careless-weed. The soil washes on the slopes and serious damage is done to them. The valleys are injured by the washings; very little has been done to check the injury.

Cotton is shipped, from September to December, by rail from Corsicana to Galveston at \$4 50 per bale; also to Houston and to New York.

LIMESTONE.

Population: 16,246.—White, 13,075; colored, 3,171.

Area: 970 square miles.—Woodland, greater part; oak, hickory, and pine region, 140 square miles; central black prairie region, 170 square miles; brown-loam prairie region, 660 square miles.

Tilled lands: 84,299 acres.—Area planted in cotton, 35,519 acres; in corn, 32,988 acres; in oats, 2,497 acres; in wheat, 1,269 acres.

Cotton production: 9,037 bales; average cotton product per acre, 0.25 bale, 375 pounds seed-cotton, or 125 pounds pounds cotton lint.

The surface of Limestone county is somewhat rolling, and is drained by the headwaters of Navasota river, which flow in a southerly course. It is almost entirely an open prairie, with skirts of timber along the streams and covering the eastern corner of the county. A line of low hills passes in a southerly course a few miles west of the railroad, which receive the name of "Tehuacana hills", and are a part of the "Blue Ridge" chain, already mentioned in the general description. These are formed from Tertiary sandstone, fossiliferous in places, and very nearly mark the dividing line not only between the Tertiary and the Cretaceous formations, but also that between the black waxy prairies of the central region and the brown-loam prairies that border it on the east.

Three general classes of lands are found in this county, viz:

(1) The black prairies on the west of the hills, with their stiff calcareous soils and still stiffer underclays. They are underlaid by white and soft or rotten limestones (Cretaceous), which often come to the surface. These lands are difficult to till, but are very productive, yielding from 800 to 1,000 pounds of seed-cotton per acre.

(2) The brown-loam prairies (Tertiary), with a soil rather stiff, a surface quite level, and partly covered with a growth of mesquite. The lands are easily tilled, and are very productive. (See analysis, page 27.)

(3) The timbered lands (Tertiary), with their gray sandy soils and clay subsoils, which occupy the eastern corner of the county. The timber growth is post, live, and black oaks and hickory, etc., as in the large region of which it is a part. The streams have a growth of elm, hackberry, ash, etc.

Limestone is largely an agricultural county, the tilled lands comprising 13.5 per cent. of its area, or 86.9 acres per square mile. Cotton is the chief crop, the average being 36.6 acres per square mile, or 42.1 per cent. of the tilled lands.

ABSTRACT FROM THE REPORT OF C. M. BELL, M. D., OF TEHUACANA.

The chief cotton-producing soils are the *brown and black sandy loams of the upland prairies*, interspersed with small patches of heavy, black waxy soil. The same extend to the sandy timbered uplands on the southeast, about 3 miles from this place, and from 20 to 30 miles in other directions. Such is about three-fourths of the area of this region. The prairie bears a scattered growth of mesquite; along its water-courses are ash, elm, and hackberry. The *timbered uplands* have a growth of post oak and hickory. These soils are about 15 inches deep. The sandy soil rests upon a subsoil of tough ferruginous and impervious clay, and the black waxy upon grayish impervious joint clay; they are underlaid by sand at 4 feet. The soils are early, warm, well drained, and easily tilled (except the black waxy in wet weather), and are well adapted to cotton and corn, and the waxy to small grains. About one-third of the cultivated land is planted in cotton. The plant usually grows 3 feet high, is most productive at 4 feet, and inclines to run to weed when showers are too frequent. Could the farmer know that the season was to be wet, the remedy would consist of topping and root pruning. The seed-cotton product per acre of fresh land is 1,200 pounds, 1,000 pounds making a 475-pound bale of lint. After ten years' cultivation (unmanured) the product per acre is about 1,000 pounds, and after twenty years 800 pounds, the ratio of seed to lint and the quality of staple remaining about the same. The most troublesome weeds are crab-grass on the sandy and cocklebur on the waxy soil. Very little of such land lies "turned out", and it produces as well as originally when again cultivated. Slopes readily wash and gully, but are not seriously damaged, nor are the valleys injured by the washings. Slight but successful efforts have been made to check the gullying by horizontalizing.

There is a general lack of rain in June and July. Wet summers are always followed by caterpillars in the cotton of timbered lands, but they rarely do much damage on the prairies.

Cotton is shipped about Christmas, by rail, to Galveston at \$4 50 per bale.

ABSTRACT FROM THE REPORT OF J. Z. ADAMS, OF KOSSE.

The sandy prairie land is best adapted to corn, though much of the land in cultivation is given to cotton. Cotton grows to a height of 4 feet, is inclined to run to weed, and produces about a bale (500 pounds) of lint on every three acres. About 1,700 pounds of seed-cotton are required to make 475 pounds of lint. The lands wash readily when rolling.

FREESTONE.

Population: 14,921.—White, 8,269; colored, 6,652.

Area: 880 square miles.—Woodland, about seven-eighths; oak, hickory, and pine region, 780 square miles; brown-loam prairie region, 100 square miles.

Tilled lands: 100,693 acres.—Area planted in cotton, 31,372 acres; in corn, 29,242 acres; in oats, 1,462 acres; in wheat, 151 acres.

Cotton production: 8,182 bales; average cotton product per acre, 0.26 bale, 390 pounds seed-cotton, or 130 pounds cotton lint.

The surface of Freestone county is somewhat rolling and well timbered, except on the west, where the corner reaches into the broad brown-loam prairie region that is so prominent in Navarro and Limestone counties. The eastern part of the county is watered by the Trinity river and its tributaries; the western by some of the headwaters of the Navasota river.

The prairies have soils varying from dark loam to black waxy in character, and are underlaid by heavy clay subsoils, similar to those of the black prairie region. The rest of the county is covered with sandy lands having clay subsoils, and has a timber growth of post and black-jack oaks, hickory, and short-leaf pine. Cypress and cedar trees occur occasionally.

The bottom lands of the river are usually stiff and waxy in character, have a tall timber growth of oaks, ash, pecan, etc., and are more or less subject to overflow. The cultivated lands of Freestone county comprise 17.9 per cent. of its area, with an average of 114 acres per square mile. The acreage of cotton is larger than that of any other crop, but does not comprise one-third of the tilled lands; its average is 35.7 acres. In the average of population and cotton acreage per square mile, as well as in the seed-cotton product per acre, it is almost exactly similar to Limestone county.

ABSTRACT FROM THE REPORT OF H. MANNING, OF BUTLER.

About four-fifths of the county is upland, one-tenth valley land and creek bottoms, and one-tenth is embraced in Trinity river bottom and prairie on the uplands of the western part of the county. The chief crops of this region are cotton and corn.

The *uplands* bear a natural growth of post and black-jack oaks, hickory, a little sumac, and a thick growth of underbrush generally. The soil is a brown, fine sandy (gravelly in places) loam, 12 inches thick. The subsoil is heavier, contains some pebbles, and is generally underlaid by clay. The soil is early, warm, well drained, and easily tilled, except in wet seasons, when crab-grass makes tillage difficult. It is best adapted to cotton, with which two-fifths of its area is planted. In wet seasons (on this and the soil next described) the plant is inclined to run to weed; topping sometimes causes the plant to commence bolting. Usually the plant grows from 3 to 4 feet high. The seed-cotton product per acre of fresh land is from 1,200 to 1,300 pounds, about 1,455 pounds making a 475-pound bale of lint. After ten or fifteen years' cultivation (unmanured) the product per acre is from 1,000 to 1,000 pounds, about 1,515 pounds then making a bale of lint a shade inferior (shorter) than that from fresh land. The most troublesome weed is crab-grass. One-eighth of such land lies "turned out", and when again cultivated it produces well for a few seasons. These lands wash readily on slopes, doing serious damage; the valleys are also injured to some extent, sometimes covering them with sand in spots of 1 or 2 acres. No efforts have been made to check the damage.

The valley and creek *bottom lands* have a natural growth of red and pin oaks, sweet gum, a little walnut, and linden, and brier thickets. The soil is a blackish, fine sandy loam, 2 feet deep. The subsoil is lighter, and is underlaid by sand, sometimes by clay. Tillage is easy if not too wet, and the soil is early and warm if well drained, for which purpose ditches are often necessary. The soil is best adapted to cotton, though corn does well on it. Cotton occupies one-half the cultivated area, and usually grows from 5 to 6 feet high. The seed-cotton product per acre of fresh land varies from 1,500 to 2,000 pounds, 1,455 pounds making a 475-pound bale of very long lint. After ten or fifteen years' cultivation (unmanured) the product varies from 1,200 to 1,500 pounds, 1,515 pounds then making a bale of shorter lint. Crab-grass and burs are troublesome weeds. Very little of such land lies "turned out".

The *Trinity bottom land* bears a natural growth of red, pin, and burr oaks, pecan, and ash. The soil is black, adhesive, putty-like, and several feet deep; the subsoil is like it, excepting its light color. Tillage is difficult when too wet or too dry; the soil is early, warm, and to some extent naturally well drained, though some ditching is necessary. The soil is equally well adapted to corn and cotton, and one-half of its cultivated area is planted in the latter. The plant grows from 5 to 6 feet high. The seed-cotton product per acre of fresh land varies from 1,200 to 1,500 pounds, 1,485 pounds making a 475-pound bale of very good lint. Ten years' cultivation (unmanured) makes but little difference in the quantity or the quality of the cotton product. Cockleburrs are the most troublesome weeds. Very little of this land lies "turned out".

Cotton is shipped in November and December, by rail, to Galveston at \$4 a bale.

ANDERSON.

Population: 17,395.—White, 9,619; colored, 7,776.

Area: 1,000 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 78,814 acres.—Area planted in cotton, 23,725 acres; in corn, 29,852 acres; in oats, 2,780 acres; in wheat, 17 acres.

Cotton production: 7,548 bales; average cotton product per acre, 0.32 bale, 480 pounds seed-cotton, or 160 pounds cotton lint.

Anderson county is bounded on the east and west by the Neches and Trinity rivers, Palestine, the county-seat, being situated on the divide between their tributaries. The surface of the county is rolling, and very generally timbered with post and black-jack oaks, hickory, and short-leaf pine. In the eastern part of the county the latter largely predominates, and furnishes a large supply of lumber for the many mills that are located in that region.

There are a few prairies on the north and west, but their combined areas do not probably exceed one-fifth that of the county. Beds of concretionary iron ore (Tertiary) are found at Palestine and northward half-way between the Neches and Trinity rivers.

The uplands consist of gray sandy soils in the pineries of the east and intermixtures of areas of gray sandy and red-loam soils over the remainder of the county, which are underlaid very generally by red or yellow clayey subsoils. The surface soil is usually quite dark from decayed vegetation. (See analysis, page 25.) Besides these, there are small bodies of poor and unproductive lands, the soils of which are little else than sand, nearly a foot in depth, and whose subsoils, also poor, do not supply their deficiency in the elements of plant-food.

The bottom lands of the rivers are in some places quite wide, and have a black and stiff clayey soil, large timber growth of oaks, ash, etc., and are more or less subject to overflow. All of these lands are described in the abstracts given below.

Anderson is chiefly an agricultural county, though rather sparsely populated outside of the towns. The lands under cultivation average about 79 acres per square mile, or 12.3 per cent. of the entire area. The acreage of corn is greater than that of cotton, the latter, averaging 23.7 acres per square mile, comprising only 30.2 per cent. of the tilled lands.

ABSTRACTS FROM THE REPORTS OF W. H. TUCKER, OF PALESTINE, AND DR. WILLIAM HAMLETT, SR., OF BEAVER.

The lands of the county, according to Dr. Hamlett, comprise 33 per cent. of upland clayey loam, varying in color from yellow to black, and commonly designated chocolate soil; 33 per cent. of black upland sandy loam; and 15 per cent., of commonly-designated sand flats, composed of fine and coarse whitish sand.

The *upland clayey loam* is the preferable soil for cotton, and is from 3 to 5 (frequently 10) feet deep. The underlying material is a hard-pan, generally impervious; otherwise similar to the surface soil. The soil is always easily tilled, except when extremely wet, is early and well drained, and bears a natural growth of hickory, black-jack, post oak, and a great variety of other timber. The chief crops of this region are corn, cotton, potatoes, ribbon- and sugar-cane, etc. The soil is apparently best adapted to cotton and small grains; other crops do well, however. One-half the cultivated area of this soil is planted in cotton, the average and most productive height being 5 feet. Deep cultivation inclines the crop to run to weed, for which topping early in August is the remedy. The average seed-cotton product per acre of fresh land is 1,200 pounds; lint rates as middling. After five years' cultivation (unmanured) the average product is 900 pounds; the staple then rates as low middling. Cockleburrs and hog-weeds are the most troublesome. About one-twentieth of such land lies "turned out", and produces a little better when again cultivated. The soil on slopes washes and gullies, injuring the land to the extent of 5 per cent. in ten years. Valleys are rarely injured by the washings; sometimes they are improved by it. Some efforts to check the damage by horizontalizing and hillside ditching have been made with success.

The *black upland sandy soil* is 30 inches deep, and naturally bears hickory and a great variety of oaks and other timber. The subsoil is heavier but lighter in color, and is hard-pan, underlaid by sand at 10 feet. Tillage is always easy, and the soil is early, warm, and well drained, and perhaps best adapted to cotton, to which one-half its cultivated area is devoted. The plant attains the height of 2½ or 3 feet; is most productive at 2½ feet. Wet weather and deep cultivation incline it to run to weed, the remedy for which is topping early in August. The seed-cotton product per acre on fresh land is 1,000 pounds; lint rates as middling. Three years' cultivation without manure reduces the product to 750 pounds, and the staple deteriorates to low middling. The hog-weed is most troublesome. One-tenth of such land lies "turned out", and when again cultivated it produces from 600 to 800 pounds of seed-cotton or 20 bushels of corn per acre. Slopes wash and gully as on land previously described.

The "*sand flats*" occur in bodies of from 10 to 1,000 acres, and bear a natural growth of scrub oaks, hackberry, hickory, etc. The soil is 10 inches deep, with a subsoil similar in appearance to leached ashes compressed into hard lumps; it is leachy, and is underlaid by sand and occasionally rock at varying depths. The soil is easily tilled at all seasons, and is early, warm, well drained, and is apparently best adapted to cow-pease. About one-twentieth of the cultivated part of such land is planted with cotton only because small bodies of it occur in cotton-fields. It grows from 8 to 12 inches high, yielding on fresh land from 100 to 200 pounds of seed-cotton, making good ordinary lint; the seed is very light. Weeds are not troublesome. One-half of such land lies "turned out"; none has again been cultivated. Slopes are promptly and fatally damaged by washing and gullying of the soil, and the valleys are damaged in places to the extent of one-fourth their value. No efforts to check the damage have been made.

Additional abstract from the report of W. H. Tucker.

The *lowlands* consist of the black, stiff, buckshot soil of the Trinity river bottom and the black and brown sandy soils of tributary streams, covered with a growth of overcup, pin, and burr oaks, and ash; pecan occurs on the upland prairies. The Trinity bottom soil is from 2 to 8 feet deep; the subsoil is heavier, has more or less red clay, which bakes hard when exposed, but gradually becomes like the surface soil, is impervious when undisturbed, and contains soft yellow gravel, underlaid by gravel and solid rock at from 12 to 15 feet. Tillage is rather difficult. The soil is early when well drained, but late as it is now cultivated. Cotton must be planted from ten to fifteen days later than on the uplands; and for this reason the crop is late in the fall, and is liable to be prematurely frost-killed. Some of the best yields on lowlands are from cotton planted in May. The soil is best adapted to cotton and corn, and cotton is raised on about half its cultivated area. The plant grows from 4 to 8 feet high, but is most productive at 4 or 5 feet. On fresh land, in wet seasons, it inclines to run to weed, which is remedied by topping and thinning out. The seed-cotton product per acre of fresh land varies from 900 to 1,800 pounds, one-third of which is lint, rating as good ordinary to good middling. The quantity of product does not decline during the first three years, and fresh lands produce the best staple. Crab-grass and cocklebur are the most troublesome weeds on this and other lowlands. Very little improved land of this kind lies uncultivated, which improves by rest. The washings from upland slopes are not damaging to lowlands unless they consist wholly or largely of sand. Efforts have been made to check such damages by horizontalizing, hillside ditching, and embanking, and generally with very good results.

The *black and brown sandy soils* of smaller streams are from 1 to 4 feet deep, and have a growth of overcup and post oaks, hickory, dogwood, birch, and sumac. The subsoil is heavier, more or less mixed with red clay, impervious in places, contains soft yellow angular gravel, and sometimes, near water-courses, large pebbles, inclosing sea-shells. It is underlaid by rather soft lime-rock at from 4 to 10 feet. The soil is usually easily tilled in wet or dry seasons, is early when well drained, and is best adapted to cotton and corn. About half its cultivated area is generally planted in cotton. The plant usually grows from 3 to 6 feet high, yields most at from 3 to 5 feet, and inclines to run to weed when land is fresh and seasons unusually wet, which is remedied by topping and thinning out. The seed-cotton product per acre of fresh land varies from 700 to 1,500 pounds.

Cotton is shipped, as soon as baled, from Palestine to Houston at \$3, or chiefly to Galveston at \$3 75 per bale.

CHEROKEE.

Population: 16,723.—White, 11,014; colored, 5,709.

Area: 1,000 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 90,480 acres.—Area planted in cotton, 29,708 acres; in corn, 37,244 acres; in oats, 4,312 acres; in wheat, 210 acres.

Cotton production: 9,813 bales.—Average cotton product per acre, 0.33 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

Cherokee county is separated from the counties on the west by the Neches river, while Angelina river forms a part of the eastern boundary. The tributaries of these two streams in this county are very short. The northern part is undulating and partly timbered with oak, hickory, and short-leaf pine, and is partly small open prairie land, known as brush prairies. These prairies are rapidly being covered with a low growth of red, post, and black-jack oaks, attributable, it is thought, to the discontinuance of the custom of burning off the grasses for many years past.

Two miles south of Jacksonville we come to a region of iron-ore hills that occupies the central portion of the county southward to 4 miles beyond Rusk, the county-seat. The highest of these hills is found near Rusk, and is called the mountain, because of its prominence. It has a height of 175 feet above the valley, or 125 feet above the town, and its abrupt sides are covered with masses of ore and ferruginous sandstone. Its summit, nearly 2 miles in width, has a deep, white sand over most of its surface, and a growth of oak and hickory. The ore is said to be rich, and was at one time utilized. The southern part of the county, and a belt from 3 to 10 miles along the river on the west of the hills, is more level, and has a timber growth, in which pine is most prominent, which is said to be very dense 12 miles south of Rusk.

The lands of the northern and central portions of the county are mostly gray and sandy, interspersed with numerous areas of red soils, and usually filled with ferruginous gravel, which is said to render them drouthy. The subsoils are generally heavy clays. The lands of the pinneries on the west and south are sandy, and, excepting those in the immediate vicinity (bottoms) of the rivers, which are black and stiff, are considered poor. The lands under cultivation in the county comprise about 14.1 per cent. of its area, the remainder being still in their original condition. Of the various crops corn is the chief, the acreage of cotton being less than one-third of the tilled lands, with an average of 29.7 acres per square mile.

ABSTRACTS FROM THE REPORTS OF J. T. WALKER, OF ETNA (SMITH COUNTY), AND W. F. THOMPSON, OF JACKSONVILLE.

Cotton is raised chiefly on the uplands, which embrace three kinds of soils, viz, mulatto, gray sandy, and red.

The *fine sandy and gravelly, mahogany-colored loam* comprises fully one-half of the county, and extends north about 7 or 8 miles, south 15 or 16, east 9 or 10, and west 25 or 30 miles. It bears a natural growth of red, post, and black-jack oaks, and hickory. The soil is 6 inches deep, with a subsoil heavier in character, lighter in color, and freely mixed with sand. It contains "black gravel", and is underlaid by red and yellow clay at from 1 to 3 feet. Tillage is easy in wet or dry seasons, and the soil is early, warm, and generally well drained. The chief crops are cotton, corn, oats, potatoes, and sorghum, but the soil is apparently best adapted to cotton. All the crops named, as well as vegetables in great variety, do well here.

One-half the cultivated area is planted in cotton, the usual height of which is 4 feet, but the yield is greatest at 5 feet. When there is too much rain, the plant inclines to run to weed on this and other soils, to restrain which some farmers pinch off the top bud when from 3 to 4 feet high. The seed-cotton product per acre of fresh land in an average season is 1,000 pounds, 1,545 pounds making a 475-pound bale of middling lint. After fifteen years' cultivation (unmanured) the product per acre, well cultivated, is 700 pounds, and about 30 pounds less is required to make a bale, and the staple is shorter. Rag-weed, careless-weed, and cocklebur, especially crab-grass, are the most troublesome weeds. About one-twentieth of this land originally cultivated now lies "turned out", but after several years' rest it produces two or three crops almost equal to those of fresh land unless the soil has been washed away. Slopes are damaged to a serious extent by washing and gullying of the soil, and valleys are also slightly damaged by the washings, to prevent which horizontalizing has been practiced, but with little success.

The *gray sandy loam*, embracing 35 per cent. of the uplands, has a natural growth of red black-jack, with occasional post oaks and hickory. The soil is 5 inches deep; the lighter subsoil is sandy, and is underlaid by clay at 2½ feet. Tillage is always easy, except when the ground is extremely wet, when for a short time it is too soft. One-half its cultivated area is planted in cotton, to which it is apparently best adapted. The plant usually attains the height of 4½ feet, but is more productive at from 5 to 5½ feet. The seed-cotton product per acre of fresh land is 1,100 pounds, 1,545 pounds making a 475-pound bale of middling lint. After fifteen years, with good cultivation (unmaured), the product per acre is 500 pounds, 1,485 pounds then making a bale of lint, which is then inferior, because the staple is shorter. The amount of such land "turned out", etc., is as that of soil first described. The slopes are seriously damaged by washing, and the valleys are damaged to a great extent. No efforts have been made to check it.

The *red lands* embrace about 15 per cent. of the uplands, and are a deep red, putty-like, clayey loam, 18 inches deep, with a heavier subsoil, containing occasionally hard "black gravel" (but generally free from gravel of any kind), and underlaid by red clay at from 5 to 12 feet. They have a natural timber growth of red oak and hickory, and occasionally post oak. Tillage is difficult in wet or dry seasons. The soil is early and warm, and is apparently best adapted to corn, oats, and wheat. A small proportion of its cultivated area is planted in cotton. The plant usually attains the height of 3 feet, is most productive at 4½ feet, and yields 900 pounds of seed-cotton per acre on fresh land, 1,545 pounds making a 475-pound bale of low middling lint. After fifteen years' cultivation the product is from 750 to 800 pounds; it takes 20 pounds less to make a bale, and the lint is shorter. The objection to such land for cotton is that the cotton is stained by the red clay. The troublesome weeds are rag-weed, careless-weed, cocklebur, and a little crab-grass. Perhaps 1 per cent. of such land lies "turned out", and is worthless. Excepting wet springs and dry summers, the climate is generally all that could be desired for cotton production. On bottom lands crops are later in spring because of bad drainage, but such lands yield more cotton or corn per acre than the uplands. The red or brown lands are highest, and crops upon them advance most rapidly in spring. The gray, sandy upland endures drought better than the red or brown soil, but the crop is later.

Cotton is shipped as fast as baled to Galveston at \$3 75, and to New Orleans at \$5 10 per bale.

NACOGDOCHES.

Population: 11,590.—White, 8,550; colored, 3,040.

Area: 970 square miles.—Woodland all; all oak, hickory, and pine region.

Tilled lands: 66,863 acres.—Area planted in cotton, 16,762 acres; in corn, 25,102 acres; in oats, 886 acres.

Cotton production: 4,791 bales; average cotton product per acre, 0.29 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

Nacogdoches county is triangular in shape, and lies within the angle formed by the junction of Attoyac creek with Angelina river. The surface of the county is rolling and somewhat hilly, and well watered by numerous creeks, tributaries of the streams mentioned. It is well timbered with long- and short-leaf pines, post and black-jack oaks, hickory, etc. The mast furnishes subsistence for the hogs. The soils of the uplands are gray and sandy, interspersed with large areas of red clayey loams, and underlaid by red and yellow clays. The bottom lands have soils varying from sandy alluvial to stiff and black clays.

Blue fossiliferous marls and limestones are said to occur in various parts of the county, and blue clays at from 20 to 50 feet. The lands under cultivation average 68.9 acres per square mile, and comprise 10.8 per cent. of the county area. Cotton has an average of only 17.3 acres per square mile, that of corn being 25.8 acres. The product per acre for 1879 was far below the general average for the state. The utilization of the marls by application to the lands would prove of great benefit.

ABSTRACT FROM THE REPORT OF R. P. WHITE, OF NACOGDOCHES.

The soils are quite variable in eastern Texas. Limestone is abundant, and blue clay is found in wells at from 20 to 50 feet. The gray and red sandy soils are preferred for cotton, the red clayey soil being subject to rust, and liable to stain the staple. On the black land cotton grows too rank, and much of the so-called first crop, *i. e.*, the earlier bolls, is destroyed by the rot.

The *gray and dark and red sandy soil* embraces about half the area of the county, and is interspersed to some extent with other kinds. It has a natural growth of various oaks, hickory, pine, black-jack oak, mulberry, walnut, dogwood, and buckeye. The soil varies in depth from 1 foot to 5 feet. The subsoil is a tough clay, much of which is yellow, and some orange red, containing soft calcareous and rounded red gravel and layers of limestone. Sand, gravel, and rock are found at various places and at different depths below the surface. Tillage is generally easy, and the soil is best adapted to cotton and pease, cotton occupying at least two-fifths of the cultivated lands. The other chief crops produced here are corn, oats, potatoes, and vegetables, and tobacco does well. The cotton-plant attains a height of from 4 to 7 feet; the medium is most productive. On any soil in this region it inclines to run to weed when the weather is too wet, the remedy for which is drainage and topping in August. The seed-cotton product per acre of fresh land is from 1,000 to 1,200 pounds, 1,545 pounds making a 475-pound bale of middling lint. After twelve years' cultivation the product is from 600 to 800 pounds, 1,570 pounds then making a 475-pound bale of low middling lint. Careless-weed, cocklebur, and crab-grass (the latter on the gray sandy soil) are the most troublesome. Very little of this land lies "turned out". When again cultivated the red sandy produces well, the gray sandy not so well. All cultivated slopes, except those of black, tough soils, are inclined to wash and gully, and the damage is sometimes serious. The washings make the valley soils tough, injuring some parts and slightly improving others, to check which horizontalizing and hillside ditching have been practiced with success.

The *stiff, red clayey soil* embraces about three-tenths of the county area, bears a natural growth of black-jack and other oaks, some dogwood, sweet gum, buckeye, etc., and is from 6 to 18 inches deep. The heavier subsoil is an impervious red clay, containing soft, red, and some large rounded pebbles, and is underlaid by gravel and limestone at varying depths. The soil is early and warm, but ill-drained, and difficult to till, and it is best adapted to corn and oats, but two-fifths of its area is planted in cotton, which attains a height of from 3 to 5 feet. The seed-cotton product per acre of fresh land is from 800 to 1,500 pounds, 1,570 pounds making a 475-pound bale of low middling lint. After twelve years' cultivation the product is from 500 to 800 pounds, 1,600 pounds then making a bale of lint shorter than that of fresh land. Cocklebur is the most troublesome weed. About 4 per cent. of such land lies "turned out", and produces tolerably well when again cultivated.

The *black prairie land* covers about one-tenth of the county area, and occurs in widely distributed spots. The bordering timber consists of hickory, ash, white oak, and sweet and black gums. The soil is a blackish and black, slightly waxy, tough clayey loam from 1 to 5 feet thick. The subsoil is an impervious mulatto-colored clay, immediately underlaid by limestone, at some points only 1 foot

below the surface. Tillage is difficult in very wet or dry weather, and plowing must be done while the soil is near the medium moist condition. The soil is late, cold, ill-drained, and is best adapted to corn and oats, but two-fifths of its cultivated area is planted in cotton. The height attained by the plant varies from 4 to 7 feet, the medium being most productive. The seed-cotton product per acre of fresh land varies from 1,000 to 2,000 pounds, 1,545 pounds making a 475-pound bale of middling lint. After twelve years' cultivation the product is from 800 to 1,500 pounds, and 1,570 pounds make a bale of low middling lint. Cocklebur is the most troublesome weed. Very little of this land lies "turned out"; it produces very well when again cultivated.

Cotton is shipped from September to January, by wagons, at 50 cents per 100 pounds to Henderson, and \$1 per 100 pounds to Shreveport, Louisiana.

SHELBY.

Population: 9,523.—White, 7,369; colored, 2,154.

Area: 800 square miles.—Woodland, all; all oak, hickory, and pine region.

Tilled lands: 44,764 acres.—Area planted in cotton, 16,136 acres; in corn, 20,985 acres; in oats, 1,200 acres; in wheat, 201 acres.

Cotton production: 6,171 bales; average cotton product per acre, 0.38 bale, 570 pounds seed-cotton, or 190 pounds cotton lint.

Shelby county lies between the Sabine river on the east and Attoyac creek on the west. Its surface is more or less rolling, and is timbered with long- and short-leaf pine, red, post, and black-jack oaks, hickory, etc. The soil of the uplands is mostly a gray sandy loam 12 to 18 inches deep, with a sandy subsoil, and is underlaid by clay at a depth of several feet.

The bottom lands of the larger streams have a dark loam soil, very rich, and a large and varied growth, as shown in the abstract below.

The tilled lands of the county comprise one-eleventh of its area. The crops are corn, cotton, sugar-cane, sweet potatoes, wheat, rye, oats, rice, vegetables, and fruits. Cotton has an average of 20.2 acres per square mile, or 36 per cent. of the lands under cultivation, and its yield is a little above the average for the state.

The Sabine river affords a means of shipment by small steamboats to Beaumont, and thence by railroad or boat to New Orleans or to Galveston.

ABSTRACT FROM THE REPORT OF JOHN HOLT, OF CENTER.

There may be distinguished in this county three varieties of lands: (1) The black sandy loam and black waxy. (2) Hammock lands of a mulatto color, with some black waxy. (3) The gray and black sandy, constituting the soil of the uplands, which comprise both rolling and level lands. Both the uplands and the lowlands are well adapted to the growth and maturity of cotton. The lowlands, notwithstanding that they are more difficult to cultivate, are generally preferred to the uplands, owing to the more luxuriant growth, especially on fresh or manured land, and the greater yield per acre of the plant.

The most important soil is the *black sandy loam* of the bottom lands, which covers about 5 per cent. of the surface of the county, and has a natural growth of pine, hickory, ash, walnut, sweet and black gum, dogwood, chinquin, cherry, birch, magnolia, tupelo-gum, and white, red, post and pin oaks. The depth of the soil is 18 inches, and it is easily tilled and early when well drained. Its chief productions are cotton, potatoes, and sugar-cane.

Cotton forms 30 per cent. of the entire crops planted, and reaches a height of 6 feet, at which it is most productive. It inclines to run to weed in wet seasons, to obviate which topping is resorted to. The yield per acre of seed-cotton is 2,000 pounds on fresh land; 1,800 pounds after ten years' cultivation. In either case 1,545 pounds are required for 475 pounds of lint, which rates as good middling when from fresh land, but from the cultivated land the rating is not so good. The most injurious weeds are cocklebur and crab-grass.

The second-best soil of this county is a *dark sandy loam*, comprising 40 per cent. of the tillable area. It is 18 inches deep, and has a timber growth of hickory, pine, dogwood, sweet gum, red, black, and post oaks. It is easily cultivated, is early, warm, and well drained, and produces cotton, sugar-cane, and potatoes. One-third of the crops is in cotton, which attains a height of 4 feet, at which it is very productive; but it runs to weed in wet seasons, the remedy being underdraining. When the land is fresh 1,000 pounds of seed-cotton per acre can be produced, but this amount is diminished to 800 pounds after ten years' cultivation, 1,545 pounds being necessary for a 475-pound bale of lint in either case, rating as good middling. A very small amount of this land lies "turned out", and the yield when it is again "taken in" is as good as that from fresh land.

The *gray sandy lands* form about 50 per cent. of the county, and have a timber growth of pine, hickory, black- and white-jacks, black, red, and post oaks. The chief crops of this soil are cotton and potatoes, the former amounting to 50 per cent. of the crops planted. The soil is 6 inches deep, with a red-clay subsoil, is early, warm, and well drained, and is easily cultivated. Cotton does not run to weed on this soil; but it yields 800 pounds of seed-cotton per acre, of which 1,485 pounds are needed to make a bale, which rates as middling. After ten years' cultivation the yield decreases to 600 pounds, the staple remaining the same as when the land was fresh. Careless and hog-weeds are the most troublesome on this soil. None of the land lies "turned out". Wheat, being liable to rust, is not sown. Sugar-cane will yield on good bottom or uplands 300 gallons of sirup per acre.

Shipping commences as soon as the cotton is baled, and is sent by wagon to Shreveport, Louisiana, at the rate of \$4 per bale.

SABINE.

Population: 4,161.—White, 3,168; colored, 993.

Area: 570 square miles.—Woodland, all; oak, hickory, and pine region, 400 square miles; long-leaf pine region, 170 square miles.

Tilled lands: 15,631 acres.—Area planted in cotton, 5,252 acres; in corn, 8,322 acres; in oats, 295 acres.

Cotton production: 1,705 bales; average cotton product per acre, 0.32 bale, 480 pounds seed-cotton, or 160 pounds cotton lint.

The surface of Sabine county is rolling and well timbered with post and black-jack oaks, hickory, and pine, and is watered by the Sabine river and its tributaries.

Long-leaf pineries occur in the southern part of the county, beginning 20 miles south of Milam; sandstone (of the Grand Gulf formation) is also said to occur. The upland soils are gray and sandy, interspersed with

large areas of red lands, while the soils of the bottoms are dark sandy loams, very productive. The red lands are said to occur chiefly on the northwest, and to form a belt from 3 to 10 miles wide and 100 miles long, extending into Nacogdoches county. They have a timber growth of post and black-jack oaks.

Lumbering is the chief industry, the river affording a ready means of transportation to market.

The county is sparsely settled, and the lands under cultivation comprise but 4.3 per cent. of its area, averaging 27.4 acres per square mile. Of these about one-third is devoted to cotton culture, the average being about 9.2 acres per square mile. Live-stock comprises 6,404 head of cattle, 821 sheep, and 13,617 hogs.

ABSTRACT FROM THE REPORT OF C. W. HAMMOCK, OF MILAM.

The best cotton lands are the bottoms of small streams. They often produce a bale (475 pounds) per acre.

The uplands consist of light gray and chocolate-colored sandy soils and red soil. The sandy is the second quality of cotton land, and comprises two-thirds of the area of the county; but the red soil is better adapted to corn and oats, and often produces 35 and 40 bushels of corn (50 bushels are said to have been gathered) per acre. The *sandy soils* produce when fresh from 600 to 1,000 pounds of seed-cotton per acre, but when exhausted by cultivation not more than one-half that amount. The natural drainage is generally good. Horizontalizing and hillside ditching are practiced, and are necessary to protect the washing of slopes. Valleys are nearly ruined where the soil is covered by washings from upland slopes. Tillage is easy, except when the soil is too wet, and weeds grow rapidly. This entire region is nearly all underlaid by a heavy, stiff clay.

About Milam the *red land* predominates, and is part of a belt from 3 to 10 miles wide and 100 or more miles long, with a scrub timber growth. It is more or less interrupted by spots of gray loam, red and brown sandy soils, and creek bottoms, and all these spots are good for cotton. The red soil does not easily wash into gullies on slopes, and is not easily exhausted. Some of the old fields of it here are said to have been cultivated fifty years without manure or rest. Its timber is generally inferior.

Cotton production has increased in the ten years past, but not so rapidly as other branches of agriculture. A great deal of the land originally cultivated in cotton by large planters by means of slave labor is now lying out, and is covered with pines, its slopes being washed into gullies. Farming is now done chiefly by white men on a small scale. Not more than one-fourth of the available land in this region is cleared and cultivated.

Cotton is shipped from November to March, by wagon, to Shreveport at \$5, or by steamboat to Galveston at \$3 per bale.

SAN AUGUSTINE.

Population: 5,084.—White, 3,169; colored, 1,915.

Area: 560 square miles.—Woodland, all; oak, hickory, and pine region, 520 square miles; long-leaf pine region, 40 square miles.

Tilled lands: 25,130 acres.—Area planted in cotton, 7,219 acres; in corn, 11,442 acres; in oats, 561 acres.

Cotton production: 2,757 bales; average cotton product per acre, 0.38 bale, 570 pounds seed-cotton, or 190 pounds cotton lint.

The surface of San Augustine county is rather broken, and is well timbered with long- and short-leaf pine. It is watered by Attoyac and other creeks, all tributary to Angelina river, on the south. The lands vary from gray and sandy to a red loam; the latter is found in large areas in the northern part of the county, and is also said to cover the upland ridge in the central part. It has a timber growth of oak and hickory. The bottom lands of the streams, with widths of from 100 to 1,000 yards, have dark sandy soils, which are very productive, and a timber growth of cypress, magnolia, hickory, oak, walnut, wild cherry, sumac, and an undergrowth of cane.

Lumbering is said to be the chief industry of the county, the pine logs being rafted down the river to the mills at Beaumont, whence the sawed lumber finds its way to market by railroad.

The lands under cultivation comprise 7 per cent. of the county area, or an average of 44.9 acres per square mile. The chief crops are corn, cotton, oats, potatoes, vegetables, etc. The lands are easily tilled, and yield from 500 to 800 pounds of seed-cotton per acre. The area devoted to it has an average of 12.9 acres per square mile.

The methods of tillage, etc., are the same as given in the adjoining counties.

Shipments of cotton are made by wagon to the nearest railroad station.

ANGELINA.

Population: 5,239.—White, 4,405; colored, 834.

Area: 880 square miles.—Woodland, nearly all; one-half oak, hickory, and pine region; one-half long-leaf pine region.

Tilled lands: 19,729 acres.—Area planted in cotton, 5,681 acres; in corn, 8,957 acres; in oats, 156 acres.

Cotton production: 2,319 bales; average cotton product per acre, 0.41 bale, 615 pounds seed-cotton, or 205 pounds cotton lint.

Angelina county lies between Angelina river on the east and Neches on the west. Its surface is rolling, the uplands being mostly covered with a growth of short- and long-leaf pine, interspersed with oak and hickory, and the bottom lands with beech, magnolia, ash, walnut, etc. Prairies occur occasionally. The county is watered by the tributaries of the rivers mentioned and by numerous springs. The long-leaf pine region covers most of the southern half of the county, and that growth also occurs occasionally on the north. The lands comprise the dark loams of the bottoms, the bordering hummocks, and the sandy uplands.

The county is sparsely populated, and the lands under cultivation average but 22.4 acres per square mile, or 3.5 per cent. of the entire area. Of these cotton receives a fair percentage, 6.5 acres per square mile, though it is not the chief crop. The average yield of the county in seed-cotton per acre is greater than that of the state.

ABSTRACT FROM THE REPORT OF E. L. ROBB, OF HOMER.

The lowlands consist of the first and second bottoms of Shawnee and other creeks. The first, or cane bottoms, are from one-quarter of a mile to one mile wide, and the second bottoms, or hummocks, lie above and along each side generally, and at the head of the first bottoms, and are from one-quarter of a mile to one mile and a half wide. The uplands embrace partly gray sandy prairie lands and partly stiff, brown, and black timbered land. The chief crops here are corn, cotton, and sugar-cane.

The *bottom lands* bear a natural growth of oak, elm, hickory, beech, walnut, bamboo, cane, muscadine vine, wild peach, etc. The soil is a black and blackish alluvial loam from 2 to 4 feet deep; the subsoil is heavier, and is underlaid by sand and gravel. Tillage is easy, and the soil is early, and alike well adapted to each of the chief crops produced. One-third of its cultivated area is planted in cotton. The plant's usual and most productive height is 4 or 5 feet. Too much rain and too rich a soil incline the plant to run to weed, for which topping is believed to be a good remedy. The seed-cotton product per acre of fresh land is 1,600 pounds, 1,545 pounds making a 475-pound bale of middling lint. After five years' cultivation the product is from 850 to 1,100 pounds, 1,600 pounds making a bale of lint inferior to that of fresh land. Cocklebur, hog-weed, and coffee-weed are most troublesome. Very little of this land lies "turned out", but it is almost equal to fresh land when again cultivated.

The *hummock lands* bear a natural growth of pine, black-jack, and other oaks, hickory, ash, etc. The soil is a stiff, brown, clayey loam, from 12 to 30 inches deep. The subsoil is heavier, rather hard, and is underlaid by gravel at from 6 to 8 feet. The soil is late, easily tilled after being once thoroughly broken up, and is best adapted to cotton, with which one-third of its cultivated area is planted. The plant grows from 3 to 5 feet high, and yields from 500 to 800 pounds of seed-cotton per acre, 1,665 pounds making a 475-pound bale of lint. After five years' cultivation the product is from 400 to 700 pounds; and the ratio of seed to lint is the same, the staple being but little different from that of fresh land. Cocklebur and crab-grass are the most troublesome weeds. Very little of this land lies "turned out", and it produces very well when again cultivated.

The *timbered uplands* bear a natural growth chiefly of long and short-leaf pine, but also of considerable hickory and red and post oaks. The soil is from 12 to 24 inches deep; the subsoil is generally heavier, but sometimes light, sandy, and quicksandy. The soil is early, warm, easily tilled, and best adapted to cotton, and one-third of its area is planted with the same. The plant grows from 2 to 4 feet high. The seed-cotton product per acre of fresh land is from 600 to 1,000 pounds, 1,665 pounds making a bale of good ordinary to middling lint. After five years' cultivation (unmanured) the product is from 300 to 700 pounds, 1,780 pounds making a bale of lint a little inferior to that from fresh land. Several years' rest improves this land considerably. Crab-grass and coffee-weed are most troublesome. Slopes wash and gully readily in some places, and are seldom seriously damaged, no efforts having been made to check it. The valleys are not injured by the washings. Rather a dry season is best adapted to cotton, as too much wet weather causes shedding on all the lands and rust on the prairie and stiff, timbered lands.

Cotton is shipped in January to Galveston by the Angelina river; rates per bale, \$3 75 by flatboat, \$4 25 by steamboat.

TRINITY.

Population: 4,915.—White, 3,753; colored, 1,162.

Area: 710 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 23,491 acres.—Area planted in cotton, 6,802 acres; in corn, 9,184 acres; in oats, 159 acres.

Cotton production: 2,666 bales.—Average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

Trinity county lies between Neches river on the east and Trinity on the west, the upland that separates the tributaries of each being about midway. The surface is somewhat rolling, and consists of lands timbered on the west with short- and long-leaf pine, red and white oaks, and hickory, interspersed with small bodies of open prairies, while on the east are the long-leaf pine forests of the lumber region. The southern part of the county is underlaid by the coarse sandstone of the Grand Gulf age, which comes to the surface near Trinity station, and is exposed in the river banks, and also forms a high bluff at Riverside, on the south. The lands of the timbered uplands usually comprise sandy soils and subsoils, and are underlaid by sands and gravel, though stiff clays are found in some localities. The prairies have mostly brownish, sandy, or loamy soils, and are quite level. Near the Trinity river, and occupying what may be termed the second bottom, are small bodies of black, waxy prairies, with no timber growth except here and there a single oak, pecan, or elm tree.

The river bottom lands have a dark sandy loam soil, deep and covered with a heavy timbered growth of walnut, pecan, ash, etc. These lands are broad in some places, but are more or less liable to overflow, and are not much under cultivation.

The county is rather sparsely settled, and the tilled lands comprise but little more than 5 per cent. of its entire area. The principal crops are corn, cotton, oats, rye, vegetables, and fruits. It is claimed that the bottom lands will produce from 40 to 50, and the uplands from 20 to 30 bushels of corn per acre. The average for the entire county in 1879 (a dry year) was a little more than 10 bushels.

Cotton comprises but 29 per cent. of the lands under cultivation, or an average of 9.6 acres per square mile.

ABSTRACTS FROM THE REPORTS OF SAMUEL T. ROBB AND W. E. SHEFFIELD, OF TRINITY, AND J. W. HAMILTON, OF CENTRALIA.

The *cane bottoms* of rivers and creeks form about one-tenth of the area, and are the best cotton lands in the county. They have a width of one mile on each side of the streams, and have a natural growth of oak, gum, ash, walnut, pecan, elm, hickory, short-leaf pine, and cane. The soil is a fine sandy loam of whitish-gray and black colors, and 2 feet deep; the subsoil is heavier, but otherwise changes but little from the surface downward. It is underlaid in some parts by sand-rock at 10 feet. Tillage is easy in wet or dry seasons, and the soil is early, warm, and well drained.

The chief crops of this region are corn, cotton, sugar-cane, and a great variety of vegetables. The soil is apparently equally well adapted to all of them, but cotton occupies two-thirds of the cultivated area. The plant attains a height of from 7 to 10 feet, and in rainy weather inclines to run to weed, which may be checked by topping. The seed-cotton product per acre is from 1,500 to 1,700 pounds. After

twenty years' cultivation creek and river bottoms and hummocks and prairie lands yield as much as when fresh; but it takes less of seed-cotton to make a bale, because the seed is smaller and lighter and the staple shorter, and therefore inferior to that from fresh land. Crab-grass is the most troublesome weed.

The remainder of the county, excepting numerous small spots of black sandy and black waxy prairies, is all upland of *light gray sandy loams*, bearing a natural growth of pine, red and white oaks, sweet and black gum, and numerous kinds of vines. The soil is about 22 inches deep; the subsoil is heavier, and is underlaid by sand and gravel generally. Tillage is always easy. The land lies rather level, and is apparently best adapted to cotton or sweet potatoes. About one-half its cultivated area is planted in cotton, its most productive height varying from 2 to 4 feet. The seed-cotton product per acre is about 800 pounds, from 1,425 to 1,540 pounds making a 475-pound bale, the staple rating as good ordinary. Old land is more difficult to keep clear of weeds, and produces slightly inferior staple. Crab-grass is the most troublesome weed. About one-tenth of this land lies "turned out", but it produces very well after a rest if it has not been too badly washed. In some localities slopes are seriously damaged by washing of the soil, but these washings improve some lower lands and damage others. As there is yet plenty of new land to be had, farmers do not try to save their old fields from ruin by such washing and gullying.

The *black prairie lands* lie along the Trinity river uplands, and contain only about 1,000 acres in all. The growth is scattering oak, pecan, and elm. The soil is a black, waxy clay, having a depth of from 3 to 8 feet, and is underlaid by the sandstone at 10 or 20 feet. It is very difficult to till in wet weather, and in dry seasons it cracks open. About one-half of the crops planted on it consists of cotton, though it is best adapted to corn. Cotton grows to a height of from 2 to 4 feet, producing about 1,000 pounds of seed-cotton per acre on fresh land, 1,650 pounds being required for 475 pounds of lint. Cultivation of a few years improves it, making the yield from 1,200 to 1,400 pounds, with a longer staple. In this portion of Texas the warm and moist climate makes cotton grow rapidly.

Shipments are made in November and December, by rail, to Houston at \$2 15 and to Galveston at from \$2 90 to \$3 75 per bale.

POLK.

Population: 7,189.—White, 4,342; colored, 2,847.

Area: 1,100 square miles.—Woodland, nearly all; oak, hickory, and pine region, 430 square miles; long-leaf pine region, 670 square miles.

Tilled lands: 23,865 acres.—Area planted in cotton, 7,229 acres; in corn, 10,997 acres; in oats, 298 acres.

Cotton production: 3,629 bales; average cotton product per acre, 0.50 bale, 750 pounds seed-cotton, or 250 pounds cotton lint.

Polk county lies on the east side of Trinity river, and is watered both by its tributaries and by those of the Neches on the east. The southern portion of its surface is level, and is covered with a timber growth of long-leaf pine, which also extends into the eastern and northern part of the county, and is included in the pineries of southeastern Texas. This region is sparsely populated, and its soils are sandy and not much under cultivation. The northern and western parts of the county are more rolling in character, and consist of oak and pine lands (long and short leaf), mostly interspersed with prairies, having soils varying from black and hog-wallow to sandy. It is estimated that these prairies cover about one-tenth of the area of the county.

The bottom lands of the rivers are usually broad, and have soils varying from reddish sandy to heavy black loams, which are heavily timbered with elm, maple, walnut, cypress, cottonwood, beech, etc. The second bottoms, or valleys, are mostly black, waxy prairies, similar to those in Trinity county. The timber of the county is utilized by a large number of saw-mills, and lumbering forms a prominent industry. The two rivers are navigable during a large part of the year, and afford easy transportation to the Gulf. The East and West Texas Narrow-Gauge railroad also connects the county with Houston.

Polk county is not thickly populated, and but 3.4 per cent. of its area is under cultivation, with an average of 21.7 acres per square mile. Of the latter 6.6 acres is devoted to cotton, and its average yield in seed-cotton (750 pounds) places the county among the first fifteen in the state in product per acre.

ABSTRACT FROM THE REPORT OF J. P. KALE, OF LIVINGSTON.

The soils cultivated in cotton are the brown, blackish, and black stiff lands of the bottoms of the Neches and the Trinity rivers and all their tributaries, and black stiff upland, partly timbered and partly prairie, occurring in belts, one of which extends through the county. The uplands contain good prairie land in patches of from 20 to 200 acres, a part of which is "hog-wallow" in character. The remainder of the county is sandy upland, generally poor, and bearing pine timber. Cotton and corn are the chief crops of this region.

The *bottoms* contain one-fourth the cultivated lands of the county, and bear a growth of various oaks, hickory, ash, gum, and elm. The soil is 30 inches deep; the subsoil is heavier and generally impervious, and is underlaid by sand. Tillage is always easy, except in wet seasons, and the soil is early, warm, and well drained, and best adapted to cotton, with which one-half its cultivated area is planted. The plant grows to various heights, but is most productive at 5 feet; in wet seasons (on this and other soils) it inclines to run to weed, for which no remedy is known. The seed-cotton product per acre of fresh land is 2,000 pounds, 1,545 pounds making a 475-pound bale of middling lint. In four years' cultivation there is no decline in the quantity or quality of the cotton yield per acre, and little change is perceptible in twenty years. The same is true of the black upland next to be described. The cocklebur is the most troublesome weed on the black upland soil.

The *black, mostly prairie, upland* includes another fourth of all the cultivated area, the timbered part bearing a growth of gum, pine, and post oak. The largest prairie runs parallel with the Trinity river between Long King and Kickapoo creeks, in a northwest direction; it is very irregular and narrow in places, though sometimes 3 miles in width. The subsoil is a heavier hard-pan, generally impervious, and is underlaid by clay at various depths. Tillage is easy, except when the soil is too wet. The soil is early, warm, and well drained, and best adapted to corn; but one-half of its cultivated area is planted in cotton. Three feet is the usual and most productive height attained by the plant, which does not run to weed on this soil. The seed-cotton product per acre of fresh land is 1,600 pounds, 1,665 pounds making a 475-pound bale of low middling lint. There is no perceptible decrease after twenty years' cultivation. The uplands wash readily, doing some damage, except to the lowlands.

The *sandy pine land*, covering one-half of the county (growth generally pine), has a soil 6 inches deep, a heavier but leachy subsoil, and is underlaid by clay and rock in a few localities. Some hard, white, rounded pebbles are on the surface. The soil is easily tilled in any season, is early, warm, and well drained, and best adapted to cotton, one-half its area being planted with the same. It varies in height, and is most productive at 3 feet. The seed-cotton product per acre is from 800 to 1,000 pounds, 1,780 pounds making a bale of low middling

lint. After ten years' cultivation the product per acre is 400 pounds of seed-cotton. Cocklebur and hog-weed are troublesome, but crab-grass is the worst. About 15 per cent. of this land lies "turned out"; but when out four or five years it generally produces as well as originally. Slopes are seriously damaged by the washing and gulying of the soil, and the washings, if sand, damage good valley land by covering it. A little hillside ditching has been practiced, which successfully checks the damage. This is a good cotton region, neither low nor upland having the preference, and each has peculiar advantages. Some laborers have this season (1879) produced 10 bales each. Could the cotton-worm, worse than all other drawbacks, be gotten rid of, there would be very little uncertainty of crops on account of droughts.

Cotton is shipped in December to Galveston, by wagon and rail, at \$3 75 per bale.

HOUSTON.

Population: 16,702.—White, 9,465; colored, 7,237.

Area: 1,170 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 73,834 acres.—Area planted in cotton, 26,819 acres; in corn, 28,966 acres; in oats, 617 acres; in wheat, 29 acres.

Cotton production: 9,730 bales; average cotton product per acre, 0.36 bale, 540 pounds seed-cotton, or 18 pounds cotton lint.

Houston county lies between the Neches and Trinity rivers, which form respectively the east and west boundaries. Its surface is rolling and mostly well timbered, having small prairies interspersed throughout, and comprising about one-tenth of its area. In the eastern part of the county short- and long-leaf pine is said to predominate, while post, red, and black-jack oaks, hickory, etc., form the prevailing timber growth of the remaining portion of the uplands. On the bottom lands of the streams the growth is white and water oaks, elm, walnut, mulberry, etc.

The county surveyor, B. F. Duren, writes as follows regarding the pine region of the county:

The pineries in the eastern portion of Houston county comprise both the short- and the long-leaf species, though mostly the former. The belt extends northward along the Neches river as far as Anderson county; is about 10 miles in breadth on the east, but narrows down to three at the Anderson county-line. The timber in this belt north of what is known as the old San Antonio road is not considered valuable.

The prairies are small, and belong to the brown-loam class that occurs in so many of the counties of this part of the state. The timbered uplands have a predominance of gray sandy lands, throughout which are interspersed bodies of red loams, underlaid by red or yellow clay subsoils. The cultivated lands of Houston county comprise 9.9 per cent. of its area, and average 63.2 acres per square mile. The acreage of cotton comprises 36.3 per cent. of these, with an average of 22.9 acres per square mile, but that of corn is still greater.

ABSTRACT FROM THE REPORT OF C. E. DOUGLAS, OF CROCKETT.

The kinds of land are: (1) gray and red uplands, lying in patches and occasional large bodies of 1,000 acres or more, forming the divides between the rivers and large creeks, and constituting about 65 per cent. of the county area; (2) dark loam of the bottoms and second bottoms of the Trinity and Neches rivers and tributaries (which are numerous), occupying about 25 per cent. of the area; (3) about 10 per cent. of dark-colored prairie soil scattered over the county. The chief crops are cotton, corn, potatoes, oats, sorghum, and West India sugar-cane.

The gray and red upland soil bears a natural growth of red, post, and black oaks, hickory, mulberry, dogwood, sumac, etc. The soil is from 4 to 18 inches deep; the subsoil is heavier, generally a yellow clay, though frequently a stiff, impervious red clay, containing hard "black gravel", and underlaid by clay, sometimes rock. Tillage is easy in dry, and not difficult in wet seasons. The soil is early and warm, and for the most part naturally well drained, and is apparently best adapted to cotton, although with sufficient moisture all the chief crops succeed well.

More than three-fifths of its cultivated area is planted in cotton. The plant usually grows 4 feet high, but on fresh land and in very wet seasons it inclines to run to weed. In the first case early planting and topping is the remedy; there is no remedy for the second. The seed-cotton product per acre on fresh lands varies from 800 to 1,500 pounds, from 1,425 to 1,545 pounds making a 475-pound bale of lint, which frequently rates highest in the market. After ten years' cultivation (unmanured) the product varies from 500 to 1,200 pounds, 1,425 pounds then making a 475-pound bale of lint that is shorter than that from fresh land, but is bright in color and classes well. Some of these lands continue their original yields for twenty years (unmanured). The iron-weed (perennial) is most troublesome, but does not occur on all parts. About 1 per cent. of such land lies "turned out"; it grows up in weeds, and is expected after a rest to produce very well. Lands wash readily when improperly plowed, but very little damage is done to either slopes or valleys.

The soil of the bottoms is a mellow loam, varying in color from brown to black, and is 5 feet deep. The subsoil is a heavier bluish and yellowish clay, containing soft "black gravel", and is underlaid by clay and marl. The soil is easily tilled where drained; it is early or late, warm or cold, according to seasons, and is well drained. Its natural growth is white and water oaks, elm, black walnut, mulberry, etc. It is best adapted to cotton, corn, and sugar-cane, and three-fourths of its cultivated area is planted in cotton. The plant attains a height of from 6 to 12 feet, the medium most productive. Fresh land, wet seasons, and late planting incline it to run to weed, and early planting and thorough tillage constitute the remedy. The seed-cotton product per acre of fresh land varies from 1,200 to 2,200 pounds, about 1,545 pounds making a 475-pound bale of good lint. After ten years' cultivation (unmanured) there is little apparent deterioration if rotation of crops has been practiced, 1,425 pounds then making a bale of lint as good as that from fresh land. Very little of such land lies "turned out", and it produces very well when again cultivated. Hog-weed, butter-weed, etc., grow very rank, but are less troublesome than old stalks.

The prairie soil varies from a sandy to a clayey loam, and from gray to brown, mahogany and blackish in color, and is from 2 to 3 feet deep. The subsoil is heavier, rarely impervious, contains hard, soft, and angular "black gravel", and sometimes pebbles, and is underlaid by gravel and rock. When the soil has once been pulverized, it is easily tilled in dry seasons, but with difficulty in wet seasons. The soil is early, warm, generally well drained, and best adapted to cotton and small cereals, and one-fourth of its cultivated area is planted in cotton. The plant grows from 3 to 5 feet high, is most productive at 5 feet, and is rarely inclined to run to weed. The seed-cotton product per acre of fresh land is from 500 to 1,000 pounds, 1,425 pounds making a 475-pound bale of good lint. After ten years' cultivation (unmanured) the product is from 300 to 800 pounds, the ratio of seed to lint and quality of staple being about the same as on new land. Iron-weed is most

troublesome. Very little of this land lies "turned out", which produces well when again cultivated. When improperly plowed, slopes wash and gully readily, but are not seriously damaged, nor are the valleys materially injured. To prevent such damage nothing but judicious plowing is practiced. An occasional drought and a wet spring are, perhaps, the only circumstances adverse to the cotton-grower here.

Cotton is shipped during the gathering season, by rail, chiefly to Galveston at \$3 50 per bale; also to Houston at \$3, and to New Orleans.

LEON.

Population: 12,817.—White, 7,707; colored, 5,110.

Area: 1,000 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 68,073 acres.—Area planted in cotton, 23,578 acres; in corn, 25,490 acres; in oats, 725 acres.

Cotton production: 7,360 bales; average cotton product per acre, 0.31 bale, 465 pounds seed-cotton, or 155 pounds cotton lint.

Leon county is bounded on the east and west by the Trinity and Navasota rivers, the divide between their respective tributaries being on the west near the latter. The surface of the county is somewhat rolling, and is well timbered with post and black-jack oaks and pine and hickory on the uplands, and cottonwood, elm, walnut, hackberry, etc., on the streams. The uplands are interspersed with brown-loam prairies, their combined area covering, it is estimated, about 100 square miles. These prairies are well supplied with grasses, and are very generally devoted to the grazing of stock. The timbered uplands have usually gray sandy loam soils with subsoils more or less clayey; those of the bottom lands are a black loam, quite deep, and rather subject to overflow.

Leon county is sparsely settled. The lands under cultivation comprise 10.6 per cent. of the county area, and average 68.1 acres per square mile. The crops of the county are corn, cotton, sugar-cane, small grain, fruits, and vegetables. Cotton, comprising 34.6 per cent. of county area, has an acreage of 23.6 per square mile, its growth and yield per acre, and the methods of its culture, etc., being the same as in the adjoining counties.

FALLS.

(See "Central black prairie region".)

ROBERTSON.

Population: 22,383.—White, 11,386; colored, 10,997.

Area: 870 square miles.—Woodland, nearly all; oak, hickory, and pine region, 840 square miles; brown-loam prairie region, 30 square miles.

Tilled lands: 117,990 acres.—Area planted in cotton, 49,854 acres; in corn, 34,255 acres; in oats, 1,407 acres; in wheat, 67 acres.

Cotton production: 18,080 bales; average cotton product per acre, 0.36 bale, 540 pounds seed-cotton, or 180 pounds cotton lint.

Robertson county lies between the Navasota and Brazos rivers, which form respectively the east and west boundaries, Calvert, the county-seat, being situated on the divide between their tributaries. Its surface is undulating, with a small area of mesquite prairies on the north around Bremond and on the southwest near Hearne. The rest of the county uplands are well timbered with post and black-jack oaks and hickory, and have a gray sandy soil (in places little else than deep white sand) and a red or yellow clayey subsoil. Between Hearne and Bremond there is seen the red ferruginous sandstone strata belonging to that belt which passes from the northeastern part of the state southwest into Guadalupe county. The red iron-ore hills that characterize this belt in other counties are not so prominent here. Brown coal or lignite (Tertiary) is found beneath these lands at a depth of 30 or 40 feet, and is said to be of good quality. The prairies are scarcely under cultivation. They have rather a stiff loamy soil, sandy near the timbers, and are largely covered with a low mesquite growth. They belong to the brown-loam belt that borders the central black prairie region in the counties north of Robertson.

The river lands are broad, heavily timbered with walnut, pecan, ash, elm, etc., and have reddish loam soils of great depth and productiveness. It is claimed that they will produce an average of 40 or 50 bushels of corn and 1,500 or 2,000 pounds of seed-cotton per acre in fair seasons. The county is very well populated, and the lands under cultivation average 135.6 acres per square mile, or 21.2 per cent. of its entire area. Cotton is the chief crop, comprising 42.3 per cent. of tilled lands, and averaging 57.3 acres per square mile, there being but five counties with a greater proportion of tilled lands devoted to its culture, and but three having a greater acreage of cotton per square mile, viz, Washington, Fayette, and Johnson.

ABSTRACT FROM THE REPORT OF H. D. PENDERGAST, OF CALVERT.

Bottom land includes one-fourth of all that is cultivated in the county. The soil is an alluvium, from 2 to 10 feet deep, varying from gray sandy to red and black waxy. Its growth is pin oak, ash, walnut, and pecan. The subsoil is frequently sandy, and sometimes clayey. Tillage is easy where sandy, but difficult in wet seasons where the soil is clayey or waxy. The soil is well drained, and is equally well adapted to cotton and corn, which are the chief crops of the region. More than one-half the cultivated area is planted in cotton, the height attained by the plant varying from 4 to 7 feet, but it is most productive at 5 feet. In wet seasons it inclines to run to weed on any soil here, which may be checked by ceasing to cultivate, and might be prevented, if the wet weather could be foreknown, by shallow cultivation. The seed-cotton product per acre of fresh land is 1,125 pounds. By ten to twenty years' cultivation (without manure) production has declined about one-fifth on the sandy and not any on the clayey soils, nor has the staple visibly changed in quality. Crab-grass, cocklebur, and dewberry-vines are the most troublesome as weeds. The lowlands are slightly damaged in some places by washings from the uplands. The upland slopes, however, do not readily wash and gully anywhere in this region. No efforts have been made to check the slight damage on the lowlands.

The *upland cotton-growing soil* is gray or chocolate colored, from 5 to 12 inches deep, has a red-clay subsoil, and bears a growth chiefly of post and black-jack oaks. About half its cultivated area is planted in cotton. The plant usually grows 3 feet high, or from 5 to 6 feet in wet seasons, the higher the more productive. The seed-cotton product per acre of fresh land is from 800 to 1,200 pounds, with the general ratio of 3 pounds of seed-cotton for 1 of lint, rating as low middling. The production declines about one-fifth in ten years' cultivation (unmanured), but the ratio of seed to lint and quality of staple do not apparently vary. This region is too far north to suffer from the caterpillar, and is not often affected by drought.

Cotton is shipped from October to February, about one-fourth of which goes to Galveston at about \$3 75 per bale, the balance to New York, or to the mills, at about \$8 per bale.

MADISON.

Population: 5,395.—White, 3,693; colored, 1,702.

Area: 460 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 24,268 acres.—Area planted in cotton, 9,153 acres; in corn, 9,694 acres; in oats, 322 acres.

Cotton production: 2,656 bales; average cotton product per acre, 0.29 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

Madison, a narrow county lying between Trinity river on the east and Navasota on the west, has a somewhat rolling surface, partly of open prairies and partly of timbered post-oak uplands, and is watered chiefly by the tributaries of the Trinity, the divide being in the western part of the county. The streams have a dark-loam soil, are well timbered with oak, hickory, pecan, ash, and walnut, and are subject to overflow. The rivers are bordered by low prairie valley lands or "second bottoms", with little or no timber growth, and have a black waxy soil, similar in character to the black upland prairies.

The upland prairies cover a large part of the county, and have soils varying from black waxy or clayey to brown loams, as is usual with the prairies of this portion of the state. They are interspersed with sandy post and black-jack oak uplands, the soils of which are from 6 to 10 inches deep, with clayey subsoils. One of these prairies is said to extend east and west through the county with a width of 10 or 15 miles. The lands under cultivation average 52.8 acres per square mile, or 8.2 per cent. of the entire area of the county, while 37.7 per cent. of these lands (or 19.9 acres per square mile) is devoted to the culture of cotton. The acreage of corn is the greatest. The average yield per acre of seed-cotton was in 1869 very much below that for the state.

ABSTRACT FROM THE REPORT OF P. K. GOREE, OF MIDWAY.

The lowlands consist of the bottoms of several creeks and of Trinity river, and also of black prairie second bottoms lying along the river, interspersed with sand ridges and pecan groves. Two-thirds of the upland is prairie, with a blackish, gravelly loam soil, and one-third is woodland, chiefly with a whitish, coarse sandy loam, in places sandy, in others more clayey. The uplands are rolling, and the slopes are inclined to wash and gully, but are not yet seriously damaged. Nor are the valleys materially injured by the washings, but are as often improved. Very little effort is made to check the damage.

The *prairie soil* is from 8 to 20 inches thick; the subsoil is a putty-like, impervious clay, containing hard "iron gravel" and some other pebbles. Tillage is easy, except when very wet or very dry; in the latter case the soil becomes very hard. The soil is early, warm, and portions are well drained. The chief crops are corn, cotton, and oats, from one-half to three-fifths of the cultivated part of this land being planted in cotton. The plant grows from 3 to 4 feet high, but is most productive at 4 feet. It inclines to run to weed during wet seasons, and should not ordinarily be restrained, but bolting should be favored by cultivation. The seed-cotton product per acre of fresh land is from 800 to 1,000 pounds, 1,600 pounds making a 475-pound bale of low middling to middling lint. During twenty years' cultivation (unmanured) the lands improve each year. After that time 1,545 pounds make a bale of lint, which is perhaps not perceptibly different from that of fresh land. Crab-grass is most troublesome on this and the soil next to be described. None of this land lies "turned out", but a vast amount is being brought under cultivation.

The *woodland* lies chiefly along the small streams which drain the prairies. The soil is 3 feet deep. The subsoil is an impervious yellowish and sometimes blackish clay, containing variously colored, hard, rounded, and angular pebbles. The soil is early and warm when well drained, and is easily tilled, except in wet seasons. One-half of its cultivated area is usually planted in cotton. The plant grows from 4 to 8 feet high, and inclines to run to weed in very wet seasons; but topping would remedy this if done at 4 feet high. The seed-cotton product per acre of fresh land is from 400 to 1,000 pounds; of old land, from 400 to 800 pounds, the staple being first-class alike from old or fresh land. A very small proportion of this land lies "turned out", and is somewhat improved by rest. On the river bottom crops are much more liable to be injured by excessive rains and backward springs than on the uplands.

Cotton is shipped as soon as baled by wagon to Huntsville, and thence by rail to Houston or Galveston, at a cost of from \$5 to \$6 per bale.

WALKER.

Population: 12,024.—White, 5,257; colored, 6,767.

Area: 760 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 51,129 acres.—Area planted in cotton, 20,162 acres; in corn, 17,512 acres; in oats, 387 acres; in wheat, 15 acres.

Cotton production: 6,441 bales; average cotton product per acre, 0.32 bale, 480 pounds seed-cotton, or 160 pounds cotton lint.

The surface of Walker county is more or less rolling, and is mostly covered with a timber growth of long-leaf pine, red, post, and black-jack oaks, and hickory on the uplands, and interspersed with brown-loam prairies on the west. It is watered chiefly by the Trinity river and its tributaries on the north, and a few small streams on the south which flow into the San Jacinto river. The lands are sandy loams, with red and yellow clay subsoils overlying concretionary clays and sandstones (Grand Gulf).

A large bluff of the latter occurs on the Trinity river at Riverside, and is quarried for small buildings and other purposes. It has an exposed thickness of about 75 feet, is coarse and gritty, and lies in layers of varying thicknesses, with occasional strata of clay-stone. The rock itself also sometimes incloses white clayey concretions.

The river bottom lands have dark-loam soils, with the usual bottom timber growth, and is bordered by small black prairie valley lands, or "second bottoms". The lands under cultivation in this county comprise 10.5 per cent. of its area, with an average of 67.3 acres per square mile. The crops are corn, cotton, oats, sugar-cane, vegetables, and some fruits. Very little wheat is planted. Cotton growth, yield, methods of culture, etc., are very much the same as described in Madison county.

SAN JACINTO.

(See "Southern prairie region".)

GRIMES.

Population: 18,603.—White, 8,323; colored, 10,280.

Area: 780 square miles.—Woodland, seven-eighths; all oak, hickory, and pine region.

Tilled lands: 79,877 acres.—Area planted in cotton, 35,984 acres; in corn, 29,072 acres; in oats, 555 acres; in wheat, 70 acres.

Cotton production: 11,701 bales; average cotton product per acre, 0.33 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

The surface of Grimes county is rolling, about one-eighth being prairie, and the remainder being timbered with post and black-jack oaks, hickory, short-leaf pine, dogwood, etc. A low-water divide passes north and south through the county, and on the west, forming one of the boundaries, is the Navasota river (with short tributary streams), which unites with the Brazos near the southwestern corner. On the east the county is watered partly by some of the headwaters of the San Jacinto and partly by tributaries of the Trinity river.

The prairies occur in areas of from 50 to 100 or more acres throughout the county. Their soils are mostly of the stiff, black, waxy character of the southern prairie region, underlaid by the calcareous concretionary clays of the Port Hudson age. They are not much under cultivation.

The timbered lands comprise two classes, which are intermixed, viz, the post oak and the black-jack and pine lands. The former is considered the best, and has a depth of a few inches to a clayey subsoil, while the black-jack lands are sandy to a depth of several feet. A high yield is claimed for both varieties.

The river bottom lands, with their dark and reddish alluvial soils, are the richest and most productive. They extend through the county with a width of 1 or 2 miles, and are heavily timbered with walnut, pecan, ash, etc. Grimes is principally an agricultural county, though but 16 per cent. of its area is under cultivation, averaging 102.4 acres per square mile. It is one of the chief cotton counties of the state, that crop averaging 46.1 acres per square mile, or 45 per cent. of the tilled lands.

Corn is the second crop with regard to acreage, and has an average yield of from 9 to 15 bushels per acre.

In addition to the abstract given below, Mr. Blackshear has sent the following in regard to the features of the county:

Navasota river has a bottom of from one-fourth to 1½ miles in width, with a belt of sandy, timbered upland about one-fourth of a mile wide, bordered by a prairie which gradually rises for 200 yards to a rocky bluff from 10 to 15 feet high, almost parallel with the river for many miles. Large prairies extend from this bluff to the middle of the county, becoming smaller eastward. Brazos river has a bottom proper, varying from 1 to 3 miles in width, with a belt of sandy uplands from 1 to 2 miles wide, interspersed with small meadow prairies, level and flat, rather sandy, and usually wet. Sandy post-oak lands lie in the eastern and northern parts of the county; pine lands also in the eastern portion.

ABSTRACTS FROM THE REPORTS OF P. D. SAUNDERS, OF GIBBONS CREEK, AND OF ROBERT D. BLACKSHEAR, C. H. EHINGER, AND A. R. KILPATRICK, OF NAVASOTA.

The kinds of soils cultivated in cotton are: Bottom lands of the Brazos and Navasota rivers and a few large creeks, the blackish prairies, both sandy and stiff hog-wallow lands, and the light soil of the gray, sandy, hilly, timbered lands.

The bottom land embraces one-fourth the area of the county, but not one-half of it is cultivated. The soil is an alluvium, with varying proportions of sand, orange-red to dark chocolate in color. The subsoil is lighter in color, until at a depth of from 5 to 25 feet it is composed of sand, associated with white, black, and reddish pebbles. When this soil is broken in winter or spring tillage is easy throughout the year, and the soil is early and well drained by natural ravines. Its natural timber growth is pecan, elm, hackberry, ash, hickory, and black, red, and post oaks. It is apparently best adapted to cotton, corn, and oats, but with proper cultivation it also produces potatoes and pease successfully.

Two-thirds of the cultivated portion is planted in cotton. The plant attains a height usually of from 3 to 7 feet, but is most productive at 7. It inclines to run to weed in wet weather, which is remedied by topping. The seed-cotton product per acre is from 1,800 to 2,500 pounds, from 1,545 to 1,780 pounds making a 475-pound bale of lint, which rates as good middling to fair. If rotation of crops is practiced, twenty years' cultivation shows no decline in the quantity of production and very little change in the quality of staple. Cockleburrs, tie-vines, and careless-weeds are most troublesome. Very little of such land lies "turned out", and rest improves its yield, but increases the labor in getting rid of sprouts. It is slightly improved in some places by material washed from upland slopes.

The prairies comprise two varieties, viz, black sandy prairie and black hog-wallow prairie. The first is a fine and coarse sandy loam; the second is a tenacious, adhesive, clayey loam. They vary in depth from a few inches to 4 or 5 feet, and occur in all directions for 20 miles in spots of from 50 to 500 acres or more. The timbered lands, alternating with these prairies, bear a natural growth of elm, ash, pecan, and post, pin, and black-jack oaks. The prairie subsoil is a heavy clay, varying in color from red to yellow, and is sometimes a joint clay, underlaid by alternate strata of sand and gravel in some parts, and in others by limestone, varying from 1 foot to 20 feet in thickness. The prairie soils, unless baked too hard, are easily tilled in dry weather, but are difficult to till in wet weather. They are early and warm when well drained, and are well adapted to all of the crops produced here.

From one-half to two-thirds of the cultivated area is planted with cotton, and the plant usually attains a height of from 3 to 5 feet, but is most productive at 3 feet. In favorable growing weather, with good tillage, and in wet weather, the plant inclines to run to weed, which is remedied by throwing the dirt from the row and by topping the plant. The seed-cotton product per acre varies from 1,000 to 1,600

pounds, from 1,425 to 1,635 pounds from both fresh and long-cultivated land making a bale of middling lint. If rotation is practiced, production does not decline in quantity after twenty years' cultivation. As the soil gets thinner, the stand of cotton is left closer or thicker and the width of the row is diminished, so that the production holds out. None of this land lies "turned out", but it improves by rest, and is not much injured by weeds in the interval. The most troublesome weeds on this soil are blood, careless, bur, and purslane, besides all weeds which infest southern farms; grasses do not give much trouble. Serious damage is done to slopes by washing and gulying of the soil, but the washings improve the valley lands and render them mellow and easy of tillage. To check the damage some farmers practice horizontalizing with success.

The *fine gray sandy loam* is from 5 to 18 inches thick, and comprises one-half the area of the county and seven-eighths of the land under cultivation. It has a subsoil of red and yellow clay, impervious in places, which becomes very hard when dried in the sun. It contains occasionally black and white pebbles, and is underlaid by sand, gravel, hard sandstone, and limestone in various localities, and at depths varying from 3 to 10 feet. Tillage is generally easy at any time, and the soil is early, warm, and well-drained. Its natural growth is ash, hickory, dogwood, French mulberry, some short-leaf pine, and post, black-jack, and many other oaks. It is apparently best adapted to cotton and sweet potatoes, and one-half its cultivated area is planted in cotton. The plant attains a height of from 2 to 4 feet. In wet weather plants are inclined to run to weed, which is remedied by topping and by frequent stirring of the soil. The seed-cotton product per acre varies from 600 to 1,000 pounds, 1,545 pounds making a 475-pound bale of lint, the staple rating as middling. Five years' cultivation reduces the product per acre to nearly one-half, requiring a very little less to make a bale, and the staple is a grade lower because shorter. Crab and crow-foot grasses, cocklebur, careless-weed, and May-pop vines are the most troublesome as weeds. None of this land has yet been "turned out", except that which was abandoned when laborers emigrated to Kansas. It improves much by rest and green-manuring. Many slopes are seriously damaged by washing and gulying of the soil, but the valleys are improved by the washings. Some horizontalizing and hillside ditching have been done, which check the damage except during heavy rains, when the water breaks over the dams.

The cotton crop is sometimes damaged by late and by early frosts. If planted early, and the spring be wet and the nights cool, the crop is likely to suffer from "red or sore shin" and aphides. The best time for planting here is from April 1 to 15. The crop also sometimes suffers from drought, but that cotton can grow with very little moisture was shown by the production of one-fourth of a crop in 1879 in this locality, when no rain fell between April 23 and November. Scarcely 2 bushels of corn were raised per acre. It is thought by the best farmers that a wet or very rainy May is conducive to the early appearance of the cotton-worm, whereas if we have a dry May the worm does not destroy the cotton before September or October. As evidence of this, in 1846, the first year that the cotton-worm appeared in this county, it rained the entire month of May, and the cotton crop was destroyed by the 15th or 25th of July. The yield for that year was about a 500-pound bale to 40 acres.

Cotton is shipped in November and December, or as fast as ginned, from Navasota to Houston and Galveston at from \$1 75 to \$2 50 per bale, respectively.

WALLER.

(See "Southern prairie region".)

BRAZOS.

Population: 13,576.—White, 7,325; colored, 6,251.

Area: 520 square miles.—Woodland, probably one-half; all oak, hickory, and pine region and prairies.

Tilled lands: 61,803 acres.—Area planted in cotton, 28,044 acres; in corn, 16,542 acres; in oats, 626 acres; in wheat, 8 acres.

Cotton production: 9,743 bales; average cotton product per acre, 0.35 bale, 525 pounds seed-cotton, or 175 pounds cotton lint.

Brazos county is triangular in shape, and lies within the angle formed by the junction of the Brazos and Navasota rivers, the west and east boundaries. The surface of the country is undulating, and about equally divided between prairies and timbered lands. The bottom lands of the rivers, and especially of the Brazos, are broad, and well timbered with a large growth of ash, pecan, elm, cottonwood, pin oak, hackberry, etc. The soil of the Brazos consists of the usual red loam that occurs in other counties along the river, and is very highly productive and largely under cultivation. A yield of 40 or 50 bushels of corn and 2,000 pounds of seed-cotton per acre is claimed for them. The upland prairie lands have a brownish loam soil more or less sandy, interspersed with areas of a black waxy nature, and underlaid by clays.

The timbered uplands have a timber growth of post and black-jack oaks and hickory, and a sandy and gravelly soil, quite deep, with a red or yellow clay subsoil. These lands are easily cultivated, and with the prairies yield about 800 pounds of seed-cotton per acre in fair seasons.

Brazos is better populated than most of the counties of the state, and is chiefly an agricultural county. The lands under cultivation average 118.9 acres per square mile, or 18.6 per cent. of its area.

Cotton is the principal crop of the county, comprising 45.4 per cent. of the tilled lands, with an average of 53.9 acres per square mile, a number exceeded by only six counties in the state.

ABSTRACT FROM THE REPORT OF J. W. BICKHAM, OF BRYAN.

Cotton here is a sure crop, but on account of accidents of weather and insect pests, etc., is not always a full crop. All the uplands, including creek bottoms, are well adapted to cotton, and embrace a variety of soils, including the *prairie*, which is a mixture of the black sandy and waxy soils. The timbered part is also sandy, and equal in area to the prairie, and bears a natural growth of post and black-jack oaks and hickory. The bottoms have a growth of pecan, ash, and hackberry. These kinds of soil prevail in all the upland counties of this region. Depths of soils vary from 6 to 30 inches. Tillage is easy, except when some parts are too wet. The soil is early, warm, and well drained, and best adapted to cotton, and at least one half the land is planted in the latter. The other chief crops are corn, potatoes, and hay.

The cotton-plant attains a height of from 3 to 6 feet, but is most productive at 4, and inclines to run to weed in wet seasons, or when stripped by the boll-worm. No remedy is known here. The seed-cotton product per acre of fresh land is from 1,000 to 1,200 pounds, 1,600 pounds making a 475-pound bale of low middling lint. After twenty years' cultivation the product is from 800 to 1,000 pounds, 1,545 pounds then making a bale of lint, equal in quality to that from fresh land. No land here is "turned out", but some of it would improve by a few years' rest. Slopes do not readily wash and gully, and valleys are not injured but improved by the washings.

Cotton, as soon as ready, is sold in Bryan and shipped to Galveston.

BURLESON.

Population: 9,243.—White, 5,356; colored, 3,887.

Area: 650 square miles.—Woodland, three-fourths; all oak, hickory, and pine region.

Tilled lands: 47,190 acres.—Area planted in cotton, 15,298 acres; in corn, 14,692 acres; in oats, 320 acres; in wheat, 118 acres.

Cotton production: 5,965 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

Burleson county, lying in the angle formed by the junction of the Yegua river with the Brazos, has an undulating surface, generally well timbered, and interspersed with the brown-loam prairies that occur in these central counties. It is estimated that the prairies cover about one-fourth of the county area, and have soils varying from black to reddish or brownish and sandy, with stiff clayey subsoils. These prairies are open, without any timber growth, and are well covered with grasses. The largest, varying in width from 1 to 4 miles, are known as the San Antonio and String prairies, and are thought to be better adapted to grain than to cotton. They are said to extend 50 miles northeast and many miles southwest of Caldwell, the county-seat.

The timbered lands have usually gray sandy soils, with clayey subsoils, and are timbered with a growth of post and black-jack oaks and hickory, the former predominating, and hence giving its name to the lands. The Brazos bottom lands, with a width of from 3 to 4 miles, have dark loamy and reddish clayey soils and a timber growth of pecan, cottonwood, hackberry, etc. They are the best cotton lands in the county, and are largely under cultivation, yielding over a bale of lint per acre. The tilled lands of the county comprise 11.3 per cent. of its area, and average 72.6 acres per square mile. Cotton is the chief crop, with an average of 23.5 acres per square mile, or 32.4 per cent. of the tilled land.

ABSTRACT FROM THE REPORT OF HILLARY RYAN, OF CALDWELL.

There are in this county, besides the Brazos bottom, 120 square miles of black prairie, 65 square miles of red prairie, 50 square miles of sandy black-jack oak land, and 300 square miles of sandy post-oak land.

The *Brazos bottom land* covers nearly one-fourth of the county area, and extends 200 miles up and 120 miles down the river. Its chief timber is cottonwood, pecan, and box-elder. The soil is a red alluvium, 30 feet deep, becoming more and more gravelly, and at from 30 to 40 feet is underlaid by gravel, in which water is found. This soil is easily tilled, except in wet seasons, and is best adapted to corn and cotton, which are the chief crops produced here. One-half of its cultivated area is planted in cotton. The plant grows from 8 to 12 feet high, but is most productive at 10. It inclines to run to weed in wet seasons and on new land, for which no remedy is used. The seed-cotton product per acre of fresh land is 2,000 pounds, 1,665 pounds making a 475-pound bale of middling lint. After forty years' cultivation the product is 1,400 pounds, the ratio of seed to lint remaining the same, but the staple a little shorter. Cockleburrs are the troublesome weeds.

The *red and black prairies* cover one-fourth of the area of the county, and also extend 50 miles northeast and 300 miles southwest. The soils are 12 inches deep, underlaid by heavier but leachy yellow clay, containing "black" gravel, and at 40 feet the whole is underlaid by rock. The soil is early, warm, and easily tilled, except in wet seasons, and is best adapted to corn, but one-half of its cultivated area is planted in cotton. The plant usually grows 4 feet high, the higher the more productive. The seed-cotton product per acre of fresh land is 1,200 pounds, 1,600 pounds making a bale of low middling lint. Twenty years' cultivation (unmanured) causes no decline in the quantity or quality of cotton produced. Crab-grass is the most troublesome. Slopes, alike on this and the post-oak lands, readily wash and gully, but are not seriously damaged, nor are the valleys by the washings.

Three-sevenths of the county area is *post-oak land*, the soil of which varies from a fine sandy to clay loam, and in color from gray to dark brown, and is 12 inches deep. The subsoil is a heavy adhesive clay, underlaid at 4 feet by pipe-clay. The soil is early, warm, easily tilled, and best adapted to cotton, with which one-half its cultivated area is planted. The plant usually grows 6 or 8 feet high, but is most productive at 8 feet. The seed-cotton product per acre on fresh land is 1,500 pounds, and after twenty years' cultivation (unmanured) the product and its quality are about the same. All other details are as given for the prairies last described. The cotton crop is closely dependent on the amount of rain. Seasons are usually fair, but droughts are likely to occur in July and cause shedding to a serious extent. Everything is favorable to cotton production.

Cotton is shipped in October and November, by rail, to Galveston at \$3 50 per bale.

MILAM.

Population: 18,659.—White, 14,723; colored, 3,936.

Area: 990 square miles.—Woodland, greater part; oak, hickory, and pine region, 820 square miles; central black prairie region, 170 square miles.

Tilled lands: 91,032 acres.—Area planted in cotton, 37,473 acres; in corn, 32,725 acres; in oats, 1,946 acres; in wheat, 593 acres.

Cotton production: 10,844 bales; average cotton product per acre, 0.29 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

The surface of Milam county is rolling and somewhat hilly, and is watered by Little river and smaller streams, all tributary to the Brazos, which form the eastern boundary. Nearly one-half of the county on the northwest is included in the central prairie region, its eastern limit passing northeast and southwest. Near Cameron, the county-seat, the soils are usually black, waxy, and calcareous in character, underlaid by heavy clays and Cretaceous rotten limestone, and interspersed with black sandy and brown-loam prairies, with bodies of timbered uplands rotten limestone, and interspersed with black sandy and brown-loam prairies, with bodies of timbered uplands along the streams. The southeast half of the county is well timbered with post and black-jack oaks, hickory, etc., on the uplands, and its lands are sandy, with red and yellow clayey subsoils. Beds of deep white sand, and areas of red land and ferruginous sandstone are found on the south. The Brazos river is bordered in this county by its usual wide bottom lands of stiff reddish clays and loams and large timber growth of oaks, elm, ash, pecan, etc.

The lands under cultivation average 92 acres per square mile, and comprise 14.4 per cent. of the county area. Cotton is the chief crop, with an average of 37.8 acres per square mile, or 41.2 per cent. of the tilled lands. The prairies are mostly devoted to stock grazing.

ABSTRACT FROM THE REPORT OF WILLIAM V. HEFLEY, OF CAMERON.

The soils cultivated in cotton are those of the black and sandy rolling upland prairies, the blackish and black alluvial bottoms of Little and San Gabriel rivers and Elm and Pond creeks, and the post-oak uplands.

More than one-half of the county is *prairie*. The soil is black and waxy, light brown and sandy, and is 30 inches deep. The subsoil is a red and yellow clay under the sandy, and dark colored (rarely whitish) heavy clay under the black prairie land. The soil is early, easily tilled, and best adapted to cotton; other crops also do well on it. The chief crops of this region are cotton, corn, oats, rye, barley, millet, potatoes, and onions. One-third the cultivated acreage is planted in cotton, the average and most productive height of which is 4 feet. It inclines to run to weed in wet seasons on fresh land, the remedy, if any, consisting in shallow cultivation. The seed-cotton product per acre of fresh land is from 800 to 1,000 pounds, with the usual 3 pounds of seed-cotton for one of lint from any soil, fresh or old. After three years' cultivation (unmanured) the product is from 1,200 to 1,400 pounds. (My average for ten years on this land has been 1,300 pounds of seed-cotton per acre.) The staple from old land is about equal to that from new. The most troublesome weeds are crab-grass on the sandy soil, and cocklebur, lamb's-quarter, and morning-glory on the black waxy prairie soil. There is very little or no washing of slopes.

The *bottom lands* occupy one-tenth of the area of the county. The chief growth is elm, ash, white and burr oaks, hackberry, etc. The soil is about 6 feet deep, and is underlaid by an impervious joint clay. The soil is early and easily tilled, except in wet seasons, when it is adhesive, and it is best adapted to cotton, with which two-thirds of its cultivated area is planted. The plant grows from 5 to 7 feet high, and inclines to run to weed in wet seasons, for which no remedy is used. The seed-cotton product per acre is 1,000 pounds on fresh land, or 1,500 pounds after three years' cultivation (unmanured). The troublesome weeds are cocklebur and morning-glory. (Other details of this land are as already given in the description of the prairie preceding.)

The *post oak or sandy upland* comprises about one-third the county area. The soil is 12 inches deep, presents much variety in composition and color, and has a subsoil of impervious red and joint clays containing black and white gravel. The soil is early, easily tilled, best adapted to cotton and potatoes, and one-half its cultivated area is planted in cotton. The plant usually grows from 3 to 4 feet high. The seed-cotton product per acre is from 800 to 1,000 pounds on fresh land, or from 600 to 1,000 pounds after ten years' cultivation (unmanured). (Other details as given in preceding descriptions.) The troublesome weeds are crab-grass, careless-weed, and cocklebur. Very little of this land lies "turned out". Slopes wash and gully very little, and the valleys are to some extent injured by the washings; but very little effort is made to check the damage. The river bottom lands are the richest in Texas, and are especially adapted to cotton. The uplands are more easily cultivated, healthier, and better adapted to the white race.

As soon as it is baled cotton is carried by wagons to Calvert and Rockdale, then shipped by rail to Houston or to Galveston at \$1 25 per bale.

LEE.

Population: 8,937.—White, 6,981; colored, 1,956.

Area: 600 square miles.—Woodland, nearly all; all oak, hickory, and pine region.

Tilled lands: 42,331 acres.—Area planted in cotton, 15,662 acres; in corn, 14,396 acres; in oats, 745 acres; in wheat, 136 acres.

Cotton production: 5,526 bales; average cotton product per acre, 0.35 bale, 525 pounds seed-cotton, or 175 pounds cotton lint.

The surface of Lee county is more or less rolling, with timbered post-oak lands, interspersed with brown-loam and black prairies over the entire area. It is watered by the several prongs of the Yegua creeks on the north and the tributaries of the Colorado river on the south. The Tertiary sandstone and iron-ore belt crosses the northwestern part of the county, and bodies of red lands occur in a number of places.

Near Lexington, the county-seat, beds of fossiliferous blue marl (Jackson) are frequently found in wells at depths of a few feet from the surface, and glauconitic sandstone occurs in some of the red lands of that section, giving to them a high percentage of potash (see analysis, page 25). The post-oak lands comprise the principal uplands of the county, and have a gray sandy soil, with red or yellowish clay subsoil. Heavy beds of white sand are often found associated with them.

Eleven per cent. of the area of the county is under cultivation, averaging 70.6 acres per square mile. Cotton is the chief crop, comprising 37 per cent. of the tilled lands, or an average of 26.1 acres per square mile.

ABSTRACTS FROM THE REPORTS OF C. B. LONGLEY, OF GIDDINGS, AND OF REV. A. J. LOUGHRIDGE AND ROBERT H. FLANNIKEN, OF TANGLEWOOD.

The lands cultivated in cotton are the gray, sandy, post-oak lands, bearing a natural timber growth of post and black-jack oaks and hickory; yellow, red, brown, and black prairies, with heavier subsoils; and creek bottoms, one-fourth of a mile to 2 miles wide, having a natural timber growth of wild peach, elm, pin oak, ash, pecan, mulberry, hackberry, and an undergrowth of sumac on the second bottoms. The chief crops of this region are cotton, corn, oats, wheat, millet, sorghum, sugar-cane, and sweet and Irish potatoes.

The chief soil of the county is the *fine, sandy, gravelly loam* first mentioned. It is 6 inches in depth, and has a lighter subsoil, underlaid by a yellow and red clay at from 1 foot to 4 feet. The land is early, warm, well drained, and easily tilled, and is best adapted to cotton, but produces the other crops very well. From one-half to two-thirds of its cultivated area is planted in cotton. The height attained by the plant varies from 2 to 6 feet in wet seasons, and from 1 to 4 feet in dry seasons, but it is most productive at from 2 to 4 feet. In warm, wet seasons, and when stands are too thick, the plant inclines to run to weed on all cotton lands here, the remedy, according to some farmers, consisting in giving a sufficient distance between the rows and by topping in August. The seed-cotton product per acre of fresh land is from 1,000 to 1,200 pounds, about 1,545 pounds making a 475-pound bale of lint, the staple rating as good middling. After fifteen years' cultivation the product is from 500 to 800 pounds, 1,665 pounds making a 475-pound bale, and the staple is shorter and coarser. Crab-grass and cocklebur are the most troublesome weeds.

The *prairie soils* are best adapted to small grains. There is a scattering growth of post, black-jack, pin, or water oaks, elm, hickory, and mesquite. The soil is about 30 inches deep, and is underlaid by red and joint clays, with some yellow, blue, and whitish clays in places. It is difficult to till in wet and dry seasons, and is early, warm, and well drained.

The *bottom lands* comprise the hickory and sumac second bottom, and the sandy peach and elm bottoms. The former, covering about 20 per cent. of this region, occurs in available bodies of from 1 acre to 100 acres, and has a timber growth of hickory, black-jack, and post oaks, and mulberry. The soil is a sandy loam, 2 feet in depth, with a yellow-clay subsoil, which contains some lime pebbles, and is underlaid

by sand-rock at from 5 to 10 feet. It is tilled with difficulty in wet or dry seasons, is naturally well drained, and is best adapted to cotton, corn, oats, and potatoes. One-half of its cultivated area is planted in cotton. The plant usually attains a height of 6 feet, but is most productive at 5 feet. The seed-cotton product per acre varies from 1,200 to 1,600 pounds, about 1,545 pounds making a 475-pound bale, and the staple is of the first quality. After fifteen years' cultivation the product is from 1,000 to 1,400 pounds, and about 1,630 pounds make a bale, the staple being coarser than that from fresh land. Crab-grass is the most troublesome weed.

The *sandy peach and grayish elm bottom lands* cover not more than 5 per cent. of the county, the bottoms ranging from one-fourth of a mile to 2 miles wide, and extending unbroken for several miles along the creeks. The natural timber growth is wild peach, elm, ash, pecan, mulberry, hackberry, and pin oak, with smaller undergrowth. The soil is a fine sandy loam 3 feet in depth, with a heavier and tougher subsoil, consisting of grayish or blackish sandy clay, and underlaid by sand. The soil is late, warm, and well drained, and is best adapted to corn. Cotton does equally as well, though uplands are preferred. One-third of the cultivated area is devoted to cotton, which grows to a height of from 3 to 8 feet, being most productive at 6 feet. Too much rain in conjunction with warm weather inclines the plant to run to weed, and in some cases topping is the remedy applied. The product per acre of seed-cotton from fresh land is 1,400 pounds, and after ten years' cultivation the yield is 2,000 pounds per acre, 1,425 pounds from fresh and 1,545 pounds from old land being requisite for 475 pounds of first-rate lint. A very small portion of this land lies "turned out", and when again "taken in" the land produces very well. Cocklebur, crab-grass, and careless-weed are the most troublesome weeds.

On account of their liability to overflows and to late and early frosts bottom lands are but little cultivated. They produce large yields, however, in favorable seasons. The under-bolls are liable to rot in summer and fall if there is much rain. Dry and hot weather in the spring months is favorable to cotton; cold and wet springs are detrimental. The advance of the crop is more rapid on the uplands than on the bottoms. The gray, sandy, prairie land requires the least rain to produce a crop; the red prairie more, and the mesquite prairie most rain.

Shipments are made to Galveston at the rate of \$3 50 per bale.

BASTROP.

Population : 17,215.—White, 9,909; colored, 7,306.

Area : 900 square miles.—Woodland, nearly all; nearly all oak, hickory, and pine region.

Tilled lands : 85,732 acres.—Area planted in cotton, 35,730 acres; in corn, 31,786 acres; in oats, 1,345 acres; in wheat, 852 acres.

Cotton production : 14,714 bales; average cotton product per acre, 0.41 bale, 615 pounds seed-cotton, or 205 pounds cotton lint.

The surface of Bastrop county is more or less rolling, and is very generally timbered with post and live oaks, hickory, pine, etc. Small prairies are found in the eastern part of the county, their combined area covering, it is estimated, about one-third of its entire area. The county is divided into two parts by the Colorado river, which flows in a southeasterly course, and to which all the streams on either side are tributary.

The valley lands of the river are usually very broad, and consist of a dark reddish loam soil and a clayey subsoil, very productive, and very generally under cultivation. The timber growth of the river lands is walnut, pecan, ash, elm, etc., with several varieties of oaks.

The uplands that border the valley present broken bluffs or cedar brakes near Bastrop covered with drift sand, gravel, and rounded quartz pebbles, and almost devoid of any vegetation other than dwarf cedars. To the north and west the uplands are sandy, with a prominent growth of post and black-jack oaks, interspersed with areas of red sandy loams, ferruginous pebbles, etc. (See analysis of soils, page 26.)

There are a few prominent hills of Tertiary iron ore in this section, a part of the belt from the northeastern counties. Beds of lignite of good quality are exposed in the banks of the river above the town of Bastrop.

In the eastern and southern parts of the county there are a number of open prairies, with soils varying from sandy to black and hog-wallow in character, and having an occasional growth of mesquite and live-oak trees. Passing southward from Bastrop to Lockhart, in Caldwell county, there is at first some timbered land for 16 miles, then open black prairies, with belts of timber and some mesquite trees, for 15 miles more. Shippo lake, on the southeast, is said to have an extent of 5 miles in length, and to be from one-fourth to one and one-half miles in width.

Bastrop is an agricultural county, 14.9 per cent. of its area being under cultivation, making an average of about 95.3 acres per square mile. Cotton is the principal crop, its acreage being 41.7 per cent. of the tilled lands, or an average of 39.7 acres per square mile. Its yield per acre is above that of the adjoining counties, and also of that of the state.

ABSTRACT FROM THE REPORTS OF JOHN FAWCETT, OF SMITHVILLE, AND W. A. HIGHSMITH, OF SNAKE PRAIRIE.

The chief soils of this county are those of the river bottom, the sandy post-oak uplands, and the sandy and waxy prairies.

The *bottom lands* of the Colorado river has a less area than either of the other kinds of land, but it embraces three-fourths of all the soil at present cultivated in the county, and extends from Austin to the mouth of the river, about 300 miles. Its natural growth is post, black-jack, burr, and pin oaks, pecan, cedar, elm, and hackberry, and there are spots of prairie in it. The soil is a clay loam, putty-like in spots, varying in color from brown to black, and is from 3 to 10 feet deep. The subsoil is of a mahogany color, tough and unproductive, and is underlaid by gravel at 25 feet. The soil is easily tilled, excepting tough spots in wet weather, is early and tolerably well drained, and is apparently best adapted to cotton, to which one-half the cultivated area is devoted. Corn and cotton are the chief crops of this region. The plant grows from 4 to 7 feet high, and yields most at 5 feet, but inclines to run to weed on any soil here in long-continued wet seasons, for which topping is sometimes practiced as a remedy. The seed-cotton product per acre of fresh land is 2,500 pounds, 1,655 pounds making a 475-pound bale of good middling lint. Forty years' cultivation reduces the production to about one-half the original, 1,450 pounds of seed-cotton less being needed for a bale, and the staple being finer and shorter. Cocklebur is the most troublesome weed. Very little damage is done this soil by washings from upland slopes.

The *black mesquite prairies* are the second quality of cotton land. The soil is tough and adhesive, and occurs from 20 to 30 miles in all directions, interspersed with patches of fine sandy, gray, yellow, and blackish post-oak land. The soil is 2 feet deep; the subsoil is a tough yellow clay, baking very hard when exposed to the sun, and contains flinty pebbles and small shells, underlaid by gravel at 10 feet. Tillage is difficult in wet weather, and not very easy in dry seasons. The soil is late, cold, well drained, and best adapted to cotton.

with which one-third of the cultivated portion is planted. The usual and most productive height of the plant is 4 feet. The seed-cotton product per acre of fresh land is 1,000 pounds, 1,600 pounds making a 475-pound bale of good middling lint. Five years' cultivation (unmanured) does not diminish the product, while the staple becomes finer and longer. None of such land lies "turned out". Careless-weed is the most troublesome. Slopes are damaged to a serious extent by washing and gullying, and no efforts have been made to check the damage. The valleys are not injured by the washings.

The fine sandy, gray, yellow, and blackish *post-oak timbered lands* occur in bodies alternating with the prairies. The soil is from 3 to 6 inches deep; the subsoil is heavier, a red clay in some places and bluish joint clay in others, and is impervious, the former containing flinty rounded "black gravel". Both are overlaid by gravel in places at 15 feet. The soil is easily tilled in any season, is early, warm, and generally well drained, and is best adapted to cotton, the same occupying two-thirds of the cultivated portion. The plant attains a height of from 2 to 4 feet, and the seed-cotton product per acre of fresh land is 800 pounds, 1,545 pounds making a bale of strictly good middling lint. Twenty years' cultivation reduces the product to 500 pounds, and the ratio of seed to lint remains the same, but the staple is shorter. Crab-grass is the most troublesome weed. One-fifth of such land has been "turned out". Slopes wash and gully slightly, and valleys are damaged to a small extent by the washing. Horizontalizing and hillside ditching are very successfully practiced to check the damage.

Cotton is shipped by rail to Galveston, as soon as it is ready, at \$3 40 to \$5 25 per bale.

CALDWELL.

(See "Central black prairie region".)

FAYETTE.

(See "Southern prairie region".)

WASHINGTON.

(See "Southern prairie region".)

AUSTIN.

(See "Southern prairie region".)

COLORADO.

(See "Southern prairie region".)

LAVACA.

(See "Southern prairie region".)

GONZALES.

Population: 14,840.—White, 9,974; colored, 4,866.

Area: 1,070 square miles.—Woodland, greater part; oak, hickory, and pine region, 820 square miles; southern prairie region, 250 square miles.

Tilled lands: 88,538 acres.—Area planted in cotton, 22,729 acres; in corn, 30,984 acres; in oats, 767 acres; in wheat, 646 acres.

Cotton production: 7,511 bales; average cotton product per acre, 0.33 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

The surface of Gonzales county is rolling, and in places somewhat broken, and is watered by the Guadalupe and San Marcos rivers, which unite near the county-seat.

The northern, western, and southwestern parts of the county are well timbered with post and other oaks and hickory. The lands are diversified with gray sandy and red loam soils and sandy post-oak flats, and in places contain much ferruginous gravel. (See analysis, page 25.)

In the eastern and southern parts of the county there are open and rolling prairies, interspersed throughout the uplands, with soils varying from black to sandy, and having some mesquite growth. They also form some of the valley lands of the large streams. In the uplands of the southern part there are low ridges covered with much flinty gravel, variously colored quartz pebbles, and silicified wood (Quaternary), with also occasional outcrops of the soft Grand Gulf sandstone.

The lands of the rivers are dark loams, very productive, with a timber growth of black walnut, burr and Spanish oaks, pecan, ash, cottonwood, elm, willow, sycamore, etc., and a dense undergrowth of black and red haw, dogwood, buckeye, wild plum, and vines.

Gonzales is an agricultural county, though sparsely populated. The lands under cultivation average about 82.7 acres per square mile, or 12.7 per cent. of the entire area. Cotton comprises but 25.7 per cent. of the tilled lands, or an average of 21.2 acres per square mile.

ABSTRACT FROM THE REPORT OF B. W. BROTHERS, OF HARWOOD STATION.

San Marcos river bottom comprises one-fourth of the cultivated land of the county, the balance consisting of "hog-wallow" prairie and timbered sandy upland.

The *bottom land*, which is preferred for cotton, is of uniform quality throughout the county, and its chief growth is pecan, elm, cottonwood, and box-elder. The soil is a black loam, 30 inches deep; the subsoil is a heavier, more clayey loam, and is hard. It is overlaid by sand and gravel at 10 feet. The soil is early, warm, well drained, and equally well adapted to cotton, corn, oats, and potatoes.

which are the chief crops produced here. One-third of the cultivated area is planted in cotton. The height attained by the plant reaches from 5 to 9 feet, the higher the more productive. In very wet seasons the plant inclines to run to weed, for which topping is said to be a good remedy. The seed-cotton product per acre is about 1,400 pounds. Cocklebur and morning-glory are the most troublesome weeds. Where upland slopes are sandy they are seriously damaged by washing and gullying, which is checked by horizontalizing the rows. The valleys have not been injured by the washings. Cotton requires more time for maturing on the bottoms, but is not liable to be frost-killed.

Cotton is shipped in October and November, by rail, from Harwood to Galveston at \$4.50 per bale.

GUADALUPE.

(See "Central black prairie region".)

BEXAR.

(See "Central black prairie region".)

WILSON.

Population: 7,118.—White, 6,197; colored, 921.

Area: 790 square miles.—Woodland, little more than half; oak, hickory, and pine region, 450 square miles; southern prairie region, 340 square miles.

Tilled lands: 33,642 acres.—Area planted in cotton, 5,814 acres; in corn, 7,999 acres; in oats, 43 acres; in wheat, 96 acres.

Cotton production: 1,874 bales; average cotton product per acre, 0.32 bale, 480 pounds seed-cotton, or 160 pounds cotton lint.

The surface of Wilson county is undulating, and is watered by the San Antonio river and its tributary streams. The county is situated at the southwestern terminus of the large oak and hickory region of eastern Texas, Floresville, the county-seat, being nearly on the limit, though narrow prongs or offshoots, as it were, extend south and southwestward. Two agricultural regions are therefore here represented, viz, the post-oak uplands, covering most of the northern part, and the southwestern prairie region on the south. The former has some live-oak growth, and a soil varying from a dark to gray and sandy loam, underlaid by clays and sandstone.

The prairies on the south have partly a mesquite growth and scattered or isolated live- and post-oak trees. They have a sandy loam soil, well covered with grasses, and are usually used as grazing lands for stock.

The valley lands of the rivers, with their stiff black soils and growth of pecan, elm, ash, etc., are very wide, and seem to be the chief lands under cultivation, yielding fine crops of cotton and corn. The county is rather sparsely populated, and stock raising forms one of the chief industries. Of its area but 6.7 per cent. is under cultivation, with an average of 42.6 acres per square mile.

Cotton is as yet but a secondary crop, averaging 7.4 acres per square mile, or 17.3 per cent. of the tilled lands.

ABSTRACT FROM THE REPORT OF J. W. ANDERSON, OF SUTHERLAND SPRINGS.

The lands of the county are those of the bottoms of San Antonio river and Cibolo creek, the rolling and level post-oak uplands, and the upland prairies.

The *valley soils* are the black, shelly, and waxy loams on Cibolo creek and ash-colored alluvial loam on San Antonio river. These extend no more than 1½ miles on either side of the streams, and include one-fifth of the cultivated area of the county, being the chief cotton lands. Their natural growth is elm, hackberry, pecan, ash, and mesquite. The soil is from 2 to 8 feet deep, and is underlaid by a lighter clay, rather more impervious than the soil, the whole being underlaid by sand, gravel, and sand-rock at from 20 to 50 feet. Tillage is easy, except in wet weather, or when a real drought prevails, and in many places the soil is late, cold, and ill-drained. The chief crops of this region are corn, cotton, oats, wheat, and sweet potatoes. This soil is best adapted to cotton and corn, and two-fifths of its area is planted in cotton. The plant grows from 4 to 5 feet high, the medium being the most productive. It inclines to run to weed when excessive rains follow thorough cultivation, the remedy for which is to throw dirt from the row. The seed-cotton product per acre of fresh land is from 1,200 to 2,000 pounds, about 1,485 pounds making a 475-pound bale of lint. Ten years' cultivation (unmanured) causes no perceptible decline in the yield; a very little less is needed for a bale, and the staple is a little shorter. The cocklebur and careless-weed are most troublesome. A small percentage of such land, consisting of abandoned farms, is now lying out. When again cultivated it produces as well or better than ever.

The *post-oak land* includes one-third of the tilled lands of the county, and has a growth of post, black-jack, and some live oaks, hickory, and some bastard oak (a variety of white oak). The soil is a brown (black in some parts), fine sandy loam, from 1½ to 8 feet thick, and rests upon a lighter clayey loam, which is again underlaid by sand and sand-rock at from 15 to 40 feet. The soil is early, warm, and well drained, always easily tilled, and is best adapted to cotton, three-fifths of its cultivated area being planted with the same. The plant grows from 3 to 7 feet high, is most productive at 4 or 4½, and is inclined to run to weed as on the bottoms last described. The seed-cotton product per acre of fresh land varies from 1,200 to 2,300 and sometimes 3,000 pounds, 1,485 pounds making a 475-pound bale of low middling to middling lint. After ten years' cultivation (unmanured) the product varies from 1,000 to 2,000 pounds, and 1,625 pounds make a 475-pound bale of lint not perceptibly different from that on fresh land. Old land improves by rest, but none is known to have been "turned out". Slopes do not wash or gully badly, unless the soil is very deep, in which case the damage is very effectually checked by filling the gullies with straw or brush.

One-fourth of the county area is *upland mesquite prairie*. The soil is a varying loam (sandy, fine and coarse), gravelly, gray, red, brown, and in low places black, and is from 1½ to 5 feet thick. The subsoil is a clayey loam, pervious to water, and underlaid by sand and sand-rock at 12 to 20 feet. The soil is early, warm, generally well drained, easy to till in wet seasons, but becomes hard in dry seasons unless plowed after a rain, and is best adapted to corn, cotton, and wheat. Nearly one-half its cultivated area is planted in cotton. The plant grows about 4½ feet high, the higher the more productive. It is rarely inclined to run to weed. The seed-cotton product per acre

COTTON PRODUCTION IN TEXAS.

of fresh land is from 1,200 to 1,400 pounds, 1,545 pounds making a 475-pound bale of good ordinary to low middling lint. After ten years' cultivation (unmanured) there is no perceptible decline in the quality or the quantity of cotton produced per acre. The broom-weed and dwarf careless-weed are most troublesome.

Cotton is shipped as fast as baled, by wagon, to Cuero (De Witt county) or Marion (Guadalupe county), and thence to Galveston; rate per bale via Marion, \$5 75.

DE WITT.

(See "Southern prairie region".)

GOLIAD.

(See "Southern prairie region".)

BEE.

(See "Southern prairie region".)

KARNES.

(See "Southern prairie region".)

ATASCOSA.

(See "Southern prairie region".)

FRIO.

(See "Southern prairie region".)

MEDINA.

(See "Central black prairie region".)

LONG-LEAF PINE REGION.

(It comprises all or parts of the counties of Sabine,* San Augustine,* Angelina,* Trinity,* Polk,* San Jacinto,* Liberty, Hardin, Tyler, Jasper, Newton, Orange, and Jefferson.*)

SABINE.

(See "Oak, hickory, and pine region".)

SAN AUGUSTINE.

(See "Oak, hickory, and pine region".)

ANGELINA.

(See "Oak, hickory, and pine region".)

TRINITY.

(See "Oak, hickory, and pine region".)

POLK.

(See "Oak, hickory, and pine region".)

SAN JACINTO.

(See "Southern prairie region".)

LIBERTY.

Population: 4,999.—White, 2,565; colored, 2,434.

Area: 1,170 square miles.—Woodland, nearly all; all long-leaf pine region.

Tilled lands: 13,027 acres.—Area planted in cotton, 3,768 acres; in corn, 6,102 acres; in oats, 40 acres.

Cotton production: 1,852 bales; average cotton product per acre, 0.49 bale, 735 pounds seed-cotton, or 245 pounds cotton lint.

The surface of Liberty county is quite level. The uplands of the eastern and northern parts are well timbered with long-leaf pine and some oak, hickory, and ash; the rest, comprising, it is thought, about three-fifths of the area, has a growth of short-leaf pine, interspersed with open prairies. The Trinity river divides the county into two parts, each of which is watered by small streams that flow independently to Galveston bay. The lands of the

river bottom are broad, and have a reddish loam soil, very rich and productive, and a timber growth of cypress, magnolia, ash, walnut, etc. It is claimed that this land will produce an average of a bale of cotton per acre. The prairie second bottoms, from one-half of a mile to 2 miles wide, are said to produce as well. The timbered uplands have a sandy soil, while the lands of the prairies vary from a light sandy loam or silt to a black and stiff clay, underlaid by heavy clay subsoils.

These prairies afford fine pasturage for stock, and are mostly used for that purpose. Tarkinton's prairie is said to cover about 100 square miles. The county is sparsely populated, and but 1.7 per cent. of the lands are in cultivation, giving an average of 11.1 acres per square mile. The chief crops are corn, cotton, sugar-cane, potatoes, rice, and vegetables. Comparatively little cotton is planted (3.2 acres per square mile, or 28.9 per cent. of the tilled lands), and that only on the best lands. It grows from 3 to 5 feet high, and yields an average for the county of 735 pounds in the seed; a product higher than in any other county in southeastern Texas, and higher than the average for the state.

Shipments of produce are made by railroad either to Houston, Galveston, or New Orleans.

HARDIN.

Population: 1,870.—White, 1,634; colored, 236.

Area: 820 square miles.—Woodland, nearly all; all long-leaf pine region.

Tilled lands: 3,368 acres.—Area planted in cotton, 264 acres; in corn, 2,491 acres; in oats, 194 acres.

Cotton production: 103 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

The surface of Hardin county is quite level, and is watered by the Neches river and its numerous tributaries. With the exception of a small extent of prairie lands on the southwest, the county is heavily timbered with long-leaf pine on the uplands, and oak, beech, walnut, holly, magnolia, etc., on the bottoms.

The lands of the pineries have gray sandy soils from 12 to 18 inches deep and yellowish subsoils, and are scarcely at all under cultivation.

The hummocks comprise the farming lands of the county, the prairies, with their dark sandy soils and excellent grasses, being used for grazing purposes. Sour lake, on the southwest, is much resorted to by invalids. It is said to have an area of about 2 acres.

The population of the county is very sparse, the average being about two persons per square mile. Lumbering is the chief industry, the river affording easy shipment to Beaumont. The lands under cultivation comprise but six-tenths of 1 per cent. of the area, or 41.1 acres per square mile, and are mostly devoted to corn. Very little cotton is planted.

ABSTRACT FROM THE REPORT OF P. S. WATTS, OF HARDIN.

We have only the level, fine sandy, gray *hummock land* in this county, the soil of which is 7 inches deep to change of color. Tillage is easy, and the soil is early, and best adapted to cotton and oats, which, with corn and sweet potatoes, constitute the chief crops of the county. One-fourth of the cultivated area is planted in cotton. The plant grows from 3 to 4 feet high, is most productive at 3 feet, and is inclined to run to weed in wet seasons, for which no remedy has been tried. The seed-cotton product per acre of fresh land is 1,500 pounds, and 1,780 pounds are required to make a 475-pound bale of lint. After eight years' cultivation (unmanured) the product is 800 pounds, and 1,900 pounds make a 475-pound bale. The staple from fresh land is best. When old land rests for a few years it only produces about two-thirds of the original yield. The most troublesome weed is crab-grass.

Cotton is shipped, chiefly in February and March, by rail to Galveston at \$2 per bale.

TYLER.

Population: 5,825.—White, 4,323; colored, 1,502.

Area: 920 square miles.—Woodland, nearly all; oak, hickory, and pine region, 110 square miles; long-leaf pine region, 810 square miles.

Tilled lands: 19,371 acres.—Area planted in cotton, 5,504 acres; in corn, 11,055 acres; in oats, 1,343 acres; in wheat, 5 acres.

Cotton production: 2,543 bales; average cotton product per acre, 0.46 bale, 690 pounds seed-cotton, or 230 pounds cotton lint.

The surface of Tyler county is undulating, and is mostly well timbered, with long-leaf pine on the uplands and cypress, ash, magnolia, beech, and walnut on the streams. The county is watered by the Neches river and its tributaries, whose bottom lands are dark sandy loams, deeply colored with decayed vegetation. The county is sparsely settled. The uplands of the lower half of the county have light sandy soils, are easily cultivated, but are not very productive. Those on the north are more thickly populated, have a better class of soils, with clayey subsoils, and are interspersed with a few prairies. The latter are considered better for grazing than for farming purposes, and are not under cultivation.

The chief crops of the county are corn, cotton, oats, potatoes, and sugar-cane, and 3.3 per cent. of its area is under cultivation, with an average of 21.1 acres per square mile. Corn has twice the acreage of cotton, yielding from 10 to 15 bushels per acre.

The lands devoted to the culture of cotton comprise 28.4 per cent. of the tilled lands, averaging about 6 acres per square mile. The yield in seed-cotton is, with the exception of Liberty, much greater than in any of the counties in this part of the state, and is also greater than the general average for the state itself. The methods of tillage, improvement, etc., are the same as in the adjoining counties.

Shipments are made either by wagon to the narrow-gauge railroad in Polk county, and thence to Houston, or by boat down the river to Beaumont, and thence by railroad to Houston and to New Orleans.

JASPER.

Population: 5,779.—White, 3,241; colored, 2,538.

Area: 970 square miles.—Woodland, all; all long-leaf pine region.

Tilled lands: 17,304 acres.—Area planted in cotton, 4,455 acres; in corn, 9,763 acres; in oats, 1,097 acres.

Cotton production: 1,410 bales; average cotton product per acre, 0.32 bale, 480 pounds seed-cotton, or 160 pounds cotton lint.

The surface of Jasper county is undulating and heavily timbered, long-leaf pine comprising the almost exclusive growth on the uplands. It is watered by the Neches river and its tributaries on the west, and those of the Sabine on the east, the water-divide passing north and south through the center. The lands are sandy in character, but in the bottoms along the streams they are dark, from decayed vegetation, and have a timber growth of oak, ash, magnolia, beech, holly, etc. The county is very sparsely settled, and lumbering is the principal industry, the pine rafts being usually floated down the river to the saw-mills at Beaumont. The tilled lands comprise but about 2.8 per cent. of the county area, and average 17.8 acres per square mile. Corn is the chief crop, and yields from 10 to 15 bushels per acre. Of the lands under cultivation 25.7 per cent. is devoted to cotton, or 4.6 acres per square mile.

ABSTRACT FROM THE REPORT OF L. C. WHITE, OF JASPER.

There is here some bottom land and some heavy black loam on the uplands, but nine-tenths of the soil is *gray, sandy upland*. This soil is generally poor, but is better suited for cotton than for corn, and oats rapidly exhaust it. It extends about 100 miles in all directions, its growth being chiefly pine on the uplands, with oak, ash, hickory, gum, magnolia, and beech on the bottoms. The soil is 4 inches deep, and the subsoil is generally lighter, whiter, and sandier. It is clayey in a few places, and contains some pebbles; rock underlies some of it in the northern part of the county. Tillage is easy, except when too wet, the chief crops being corn, cotton, a little sugar-cane, and rice. Cotton occupies about one-half of the tilled lands. The plant grows usually 3 feet high, but produces most at 4 feet. In long wet periods it inclines to run to weed, and is restrained by topping all stalks, suckers, and long limbs.

The seed-cotton product per acre on fresh land is about 800 pounds, the lint rating good ordinary to middling. Old lands produce about 300 pounds of seed-cotton per acre, and 1,545 pounds from such land make a 475-pound bale of ordinary to low ordinary lint. The most troublesome weeds are cocklebur, hog-weed, and purslane. About one-half of such land lies "turned out", and after three years' rest produces well, but not as originally. Slopes are very seriously damaged by washing and gullying, but in some localities much of it is checked by horizontalizing, hillside ditching, and underdraining. The valleys are improved to the extent of 50 per cent. by the washings. This cannot be regarded as a good farming county on account of sudden changes of weather and liability to droughts. Corn does very well, but fails when hot weather begins. Cotton is liable to be mildewed, and when thus affected is sure to be attacked by worms, especially in showery weather. This is a good fruit-producing county, and apples, grapes, peaches, pears, etc., do well.

Cotton is hauled off as soon as baled; in winter, to Bevilport, at \$1 per bale; in summer, to Weiss Bluff, at \$3 per bale.

NEWTON.

Population: 4,359.—White, 2,852; colored, 1,507.

Area: 870 square miles.—Woodland, all; all long-leaf pine region.

Tilled lands: 13,450 acres.—Area planted in cotton, 3,510 acres; in corn, 7,508 acres; in oats, 513 acres.

Cotton production: 1,332 bales; average cotton product per acre, 0.38 bale, 570 pounds seed-cotton, or 190 pounds cotton lint.

Newton county is separated from Louisiana on the east by the Sabine river. Its surface is quite level and low, and is well timbered with long-leaf pine on the uplands, with cypress, magnolia, etc., on the bottom lands. The county is watered by small streams flowing into the Sabine. It is sparsely populated, and the principal industry is lumbering, the timber being floated down the river to the saw-mills at Orange.

The soils of the uplands are light and sandy; those of the bottoms are dark loams, deeply colored with decayed vegetation. The lands under cultivation average but 15.4 acres per square mile, or 2.4 per cent. of the county area. The chief crops of the county are corn, cotton, oats, and vegetables. Cotton is a secondary crop, with an average of but 4 acres per square mile; but its yield in fair seasons is from 500 to 800 pounds in the seed per acre.

The methods of tillage, improvement of the lands, etc., practiced in this county are the same as given by shippers in the adjoining counties.

Shipments are made usually by boat down the river to Orange, and thence to other markets.

ORANGE.

Population: 2,938.—White, 2,475; colored, 463.

Area: 390 square miles.—Woodland, nearly one-half; southern prairie region, 290 square miles; long-leaf pine region, 100 square miles.

Tilled lands: 2,023 acres.—Area planted in cotton, 66 acres; in corn, 1,237 acres.

Cotton production: 22 bales; average cotton product per acre, 0.33 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

Orange county is about evenly divided between prairies and woodland. The former occupies the lower portion, and has a level surface and gray silty soils, and is devoted only to stock grazing. The northern portion of the county is heavily timbered with long-leaf pine, which is largely utilized for lumber and in the production of cross-ties for the railroads. The hummock lands are low, and are suitable only for the cultivation of rice.

ABSTRACT FROM THE REPORT OF JOSEPH BUNN, OF BUNN'S BLUFF.

There is but little cotton raised in this part of the county. The lands consist of large bodies of hummocks and cypress swamps, while the largest part of the county is covered with a growth of long-leaf pine. The hummocks have a growth of short-leaf pine, oak, hickory, and magnolia. The soil is light and sandy, and is capable of producing from 500 to 1,000 pounds of seed-cotton or from 20 to 30 bushels of corn per acre.

JEFFERSON.

(See "Southern prairie region.")

SOUTHERN COAST AND PRAIRIE REGION.

East of the Brazos river: Comprises all or parts of the counties of San Jacinto, Montgomery, Waller, Harris, Liberty,* Jefferson, Orange,* Chambers, Galveston, Fort Bend,* and Brazoria.*

West of the Brazos: Washington, Austin, Fayette, Colorado, Lavaca, Gonzales,* DeWitt, Wharton,* Victoria, Jackson, Matagorda, Karnes, Wilson,* Atascosa, Frio, Medina,* Uvalde,* and Goliad.

Border counties producing but little cotton, or none at all, whose descriptions are very briefly given: Calhoun, Aransas, Refugio, San Patricio, Nueces, Duval, Bee, Live Oak, Hidalgo, and Cameron.

SAN JACINTO.

Population: 6,186.—White, 2,851; colored, 3,335.

Area: 640 square miles.—Woodland, greater part; oak, hickory, and pine region, 450 square miles; southern prairie region, 190 square miles.

Tilled lands: 25,560 acres.—Area planted in cotton, 9,840 acres; in corn, 9,494 acres; in oats, 163 acres.

Cotton production: 5,354 bales; average cotton product per acre, 0.54 bale, 810 pounds seed-cotton, or 270 pounds cotton lint.

San Jacinto county has for its eastern boundary the Trinity river, while on the southwest are the headwaters of the San Jacinto river, flowing southward.

The surface of the county is undulating, and very generally timbered with long- and short-leaf pine and some oak. On the southwest there are some prairies, with soils varying from black to gray and sandy, which are very productive. These soils are underlaid by the concretionary clays of this southern prairie region. The timbered uplands, with their predominating pine growth, have sandy soils and subsoils, and are not much under cultivation, being more valuable for their lumber.

The river lands, sometimes several miles in width, are heavily timbered with oaks, cottonwood, cypress, ash, magnolia, etc., and have soils varying from heavy black clays to the red alluvium or silt of the immediate banks of the stream. They are very difficult to till, and are considered best suited to sugar-cane and cotton.

The lands under cultivation in this county average 39.9 acres per square mile, or 6.3 per cent. of its area. Cotton is the chief crop, the average being 15.4 acres per square mile, or 38.3 per cent. of the tilled lands, and having a yield per acre exceeded by but eleven counties in the state.

ABSTRACT FROM THE REPORT OF GREENE B. BYRD, OF COLD SPRINGS.

The uplands comprise black and rolling prairies, light gray and black hummocks, wild peach, and poor pine lands, all of which are more or less devoted to cotton. The richest lands are those of the bottoms of rivers and creeks, constituting one-sixth of the county's area. River bottoms are from 3 to 5 miles wide; the creek bottoms from one-fourth of a mile to 1 mile. They bear a growth of oaks, cottonwood, cypress, hickory, ash, wild peach, beech, pine, and every kind peculiar to the heavily timbered land of this country.

The *bottom soil* is a black, stiff alluvium. Both prairie and bottom soils are 2 feet deep. The subsoils contain hard, limy clay, and are underlaid by sand, gravel, and rock. The soils are early and tillage is easy, excepting the stiff alluvium, which is difficult either when too wet or too dry. The chief crops of this region are corn, cotton, sugar-cane, sweet and Irish potatoes, vegetables, fruit, etc., the bottom lands being best adapted to sugar-cane and cotton, the prairies to corn. One-third of the cultivated area is planted in cotton. The plant grows from 3 to 5 feet high on the upland, and from 5 to 8 feet on the bottoms; it is more productive on the bottoms. On any land here the plant inclines to run to weed in wet seasons, the only remedy being to pinch off the top bud. The seed-cotton product per acre of fresh lands varies from 1,500 to 2,000 pounds, $3\frac{1}{4}$ pounds yielding a pound of good lint. After ten years' cultivation (unmanured) the product of the upland is 1,000 pounds, and of the bottom from 1,500 to 2,500 pounds per acre, $3\frac{1}{4}$ pounds yielding a pound of lint, about equal to that from fresh land. One-tenth of such land lies "turned out", but produces very well when again cultivated. The most troublesome weeds are morning-glory, cocklebur, and crab-grass.

About three-fifths of the county's area is occupied by *sandy land*, including the *hummock, wild peach, and pine lands*; they also bear oaks. These soils are from 10 to 12 inches deep. They have rarely a good clay subsoil; but where there is clay, it is chiefly pipe-clay. The subsoils contain white, rounded pebbles, and are underlaid by sand. The soils are early, easily tilled, and best adapted to corn, pease, and potatoes. One-third of their cultivated area is planted in cotton, the plants growing from 3 to 4 feet high. The seed-cotton product per acre is from 800 to 1,000 pounds, $3\frac{1}{4}$ pounds making 1 pound of good ordinary to middling lint. After ten years' cultivation (unmanured) the product is about 600 pounds, $3\frac{1}{4}$ pounds then making 1 pound of inferior lint. Crab-grass is most troublesome. One-tenth of this land lies "turned out", and produces poorly when again cultivated.

Cotton does well on all lands in this region. Some prefer the rich river and creek bottoms, others the rich rolling upland prairies, and each has its advantage. The negro laborer prefers the bottom, endures its climate, and is not affected by malarial fever, as the whites are.

Cotton is hauled by wagon to Shepherd as soon as it is baled, and thence by rail to Galveston at \$2 per bale.

MONTGOMERY.

Population: 10,154.—White, 4,926; colored, 5,228.

Area: 1,050 square miles.—Woodland, large part; oak, hickory, and pine region, 70 square miles; southern prairie, 980 square miles.

Tilled lands: 54,785 acres.—Area planted in cotton, 13,311 acres; in corn, 13,702 acres; in oats, 88 acres.

Cotton production: 4,092 bales; average cotton product per acre, 0.31 bale, 465 pounds seed-cotton, or 155 pounds cotton lint.

Montgomery is an undulating county, and is situated upon the divide between the Brazos and the Trinity rivers, but its streams find their way independently of these rivers to Galveston bay. The surface of the county is mostly timbered with a short-leaf pine and a scrubby growth of other timber on the uplands, with larger timber on the bottoms. The southern part of the county is dotted over with small prairies having a light silty soil and a sandy subsoil, the surface sometimes being dark from decayed vegetation. They are covered with grass, and are best adapted to grazing purposes. The country changes a short distance south of Willis, becoming slightly rolling, and under the sandy soil appears a mottled clay, associated with small yellow ferruginous concretions or pebbles. Thence northward the character of the country improves, the growth being more largely oak and hickory; the lands have a yellow or red subsoil, and are more generally under cultivation, yielding from 500 to 800 pounds of seed-cotton per acre. The crops of the county are corn, cotton, potatoes, etc. Lands under cultivation comprise 8.2 per cent. of the county area, and average 52.2 acres per square mile. Corn has a somewhat larger acreage than cotton, and yields from 8 to 15 bushels per acre. Cotton has an average of only 12.7 acres per square mile, comprising 24.3 per cent. of the tilled lands. Shipments are made by railroad either to Houston and Galveston, or to points northward.

WALLER.

Population: 9,024.—White, 3,192; colored, 5,832.

Area: 500 square miles.—Woodland, some; oak, hickory, and pine region, 290 square miles; southern prairies, 210 square miles.

Tilled lands: 31,665 acres.—Area planted in cotton, 10,104 acres; in corn, 10,350 acres; in oats, 126 acres.

Cotton production: 3,923 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

The surface of Waller county is quite level, and consists almost entirely of open prairies, timber only occurring along the Brazos river, which forms the western boundary, and on some of the small streams. The eastern rim of the river basin is here very narrow, the divide between its waters and those of other streams on the east lying not very far from it, and the county is itself very narrow. This divide is, however, scarcely perceptible to the eye, the surface of the country being only undulating.

The prairie lands are about equally divided between the black waxy and the sandy silt or loam, the latter occupying the broad open country on the east, the former comprising a belt near the river bottoms and smaller streams. Both varieties are covered with grasses, and are devoted mostly to stock grazing.

The bottom lands of the Brazos river are broad, and are considered the best lands of the county, but are subject more or less to malarial diseases. Their soil is a reddish clayey loam, very deep, heavily timbered with walnut, elm, pecan, ash, etc.

The lands of the county under cultivation comprise nearly 9.9 per cent. of its area, or 63.3 acres per square mile. Cotton is one of the principal crops, its acreage being but little less than that of corn, with an average of about 20.2 acres per square mile, or 31.9 per cent. of the tilled lands.

ABSTRACT FROM THE REPORT OF P. S. CLARKE, OF HEMPSTEAD.

The uplands vary much in character, and consist partly of level black and hog-wallow prairies, but mostly of light sandy loam.

The *Brazos bottom land* above overflow, covering about one-eighth of the surface of the county, is the chief soil devoted to cotton. It has a very rich soil, some of it known as buckshot, varying in color from gray to mahogany, and is about 10 feet in depth, with a timber growth of black walnut, ash, elm, hackberry, red oak, pecan, hickory, etc. It is easily cultivated, is early, warm, and naturally well drained, and produces cotton and corn. Fifty-five per cent. of the tilled land is in cotton, which attains a height of from 5 to 8 feet, the former being the better for productiveness. When too thick, or in rainy seasons, the plant inclines to run to weed, the remedy for which is thinning out and topping the plant. The yield per acre in seed-cotton is 1,400 pounds, 1,545 pounds of which are needed for 475 pounds of lint. Three years' cultivation increases the above product to 1,800 pounds, the same amount as before being necessary for a bale. Cocklebur and crab-grass form the most troublesome weeds. Very little land lies "turned out", but when again cultivated it shows the benefit of rest.

About three-eighths of the county is of the *black upland prairie land*, the soil of which is 1 foot in depth, with a subsoil of yellow clay which by cultivation becomes thoroughly mixed with the surface soil. Sand is found at 12 feet. The soil is early, warm, naturally well drained, and easily tilled in dry seasons. The chief production is cotton, yielding 800 pounds of seed-cotton per acre, 1,545 pounds being required for a 475-pound bale, and the same after three years' cultivation of the land. The height usually attained by the plant is 4 feet. Topping restrains the tendency to run to weed, which occurs in rainy seasons. When cotton is planted at the proper time it will grow to perfection without any local hinderance. The steady cotton growth in dry summers is attributed to the effects of the breeze from the Gulf, which brings moisture. Crab-grass is the only weed which occasions trouble. Very little land lies "turned out", and the yield when again "taken in" is not materially different from that of fresh land.

The *light sandy prairies* comprise about one-half of the tillable area of the county, black-jack oak, which occurs in spots, being the natural timber growth. The soil is from 6 to 24 inches deep, and has a heavy yellow clay subsoil, sometimes approaching the surface, and containing in places white gravel; it overlies sand at from 10 to 12 feet. This soil is easily cultivated in all seasons, is early, warm, and well drained, and is best adapted to cotton and sweet potatoes, the former growing to a height of 3½ feet, and yielding 600 pounds of seed-cotton per acre, 1,545 pounds being requisite for 475 pounds of lint. Many years' cultivation does not decrease the yield. As in the last soil, so in this, crab-grass is the only troublesome weed.

Shipments are made as soon as baled, by rail, to Houston and Galveston, the rates per bale being respectively \$1 50 and \$2 25.

HARRIS.

Population: 27,985.—White, 17,169; colored, 10,825.

Area: 1,800 square miles.—Woodland, a fair proportion; southern prairie region, all.

Tilled lands: 25,123 acres.—Area planted in cotton, 4,440 acres; in corn, 9,895 acres; in oats, 172 acres.

Cotton production: 1,892 bales; average cotton product per acre, 0.43 bale, 645 pounds seed-cotton, or 215 pounds cotton lint.

The surface of Harris county is generally level, with broad open prairies, interspersed with small timbered areas in "motts" and along the streams. This is especially the case in the western part, while in the extreme east, along the San Jacinto river and Spring creek, there is a well-timbered long-leaf pine region, in which are located many saw-mills. A prominent feature of the growth is the great abundance of the *Magnolia grandiflora*. It is estimated that three-fourths of the county area is open prairie, with mixed black waxy and sandy lands, the latter, however, apparently predominating. (See analysis, page 31.)

The prairies on the west, with their excellent grasses, are mostly devoted to stock-grazing, while the farming lands are situated nearer the streams.

A stiff concreterary clay (Port Hudson) underlies the greater part of the county, making proper drainage a matter of difficulty. But 2.2 per cent. of the county area is under tillage, with an average of 13.9 acres per square mile. The acreage of cotton comprises 17.7 per cent. of the tilled lands of the county, and has an average of 2.5 acres per square mile. Its product per acre for 1879 was considerably over the average for the entire state.

The city of Houston is connected with the Gulf by rail and by the waters of Buffalo bayou, which has been made navigable for ocean steamers to within a few miles of the city. It is the great railway center of southeastern Texas, and shipments can be made direct to the principal markets. Several cotton compresses are here.

ABSTRACT FROM THE REPORT OF S. P. CHRISTIAN, OF LYNCHBURG.

The rolling black upland prairies along Burnet's bay, with timbered land along the San Jacinto river, comprise the uplands of the county. All along the bay front the land is good for cotton and corn.

The *black rolling prairies* are stiff, and comprise one-third of the land of the county, extending for 30 miles up and down the bay, and lying from 1 mile to 4 miles from the river. The soil is 2 feet deep, with a subsoil of tenacious grayish clay, containing hard "black gravel". It is early, warm, and well drained, and is not easily cultivated until well broken up; but when that is properly done there is no trouble. Cotton and corn constitute the chief productions, one-half the crops being in cotton, which grows to a height of 4½ feet, and tends to run to weed in wet weather. The yield per acre in seed-cotton from fresh land or from land that has been under cultivation ten years is about 1,400 pounds, which, early in the season, is the amount needed for 400 pounds of lint, rating low middling to middling. Late in the season but 1,300 pounds are required for 400 pounds of lint. Burs and crab-grass are the only weeds which have to be contended with.

The *post-oak land*, with its growth of post and pin oaks, occurs in spots along the edge of the prairies on each side of small streams throughout the county. It has a gray clay loam soil, from 8 inches to 1 foot in depth, over a subsoil of yellow, stiff clay, is early, warm, and well drained, and difficult of cultivation, and is best adapted to cotton. Corn does not yield so well. The cotton-plant usually attains a height of from 4½ to 5 feet, yielding about 1,400 pounds of seed-cotton per acre, 1,665 pounds early in the season and 1,545 pounds later being requisite for a 475-pound bale. After nine years' cultivation the above figures are not changed. The troublesome weeds on this soil are the same as those of the black prairie.

The *sandy flat-lands* extend for miles along the edge of the prairie, reaching into the river. The growth is principally pine, with pin oak and some timber of nearly every species. The soil is very thin, with a heavier subsoil, which in the wood is inclined to bog when wet. This land is timbered, and none of it is cultivated, but serves as a winter range for cattle. We have a very mild climate, oranges growing finely; and cotton, when well cultivated and the season is suitable, produces finely. Sea-island cotton grows well, and is very productive.

ABSTRACT FROM THE REPORT OF ROBERT BLALOCK, OF LYNCHBURG.

The lands devoted to cotton comprise (1) the hummock lands, lying on creeks and bayous, with a timber growth of six varieties of oaks, pine, cedar, gum, and various small growth, and (2) the stiff prairie lands.

The soil of the *hummock land*, which covers about 1 per cent. of the county, is 2 feet 6 inches in depth, overlying clay, which varies in depth according to location, the soil being deeper on the bottom lands than on the prairies. The chief crops are cotton and corn for the market and a small amount of sugar-cane for home use. Cotton grows to a height of 5 feet, yielding 1,200 pounds of seed-cotton per acre, which is the amount needed for 400 pounds of lint, rating good middling. Only about 75 per cent. of the above yield is obtained after the land has been six years under cultivation, in which case the rating is one grade lower than that of fresh land. About five-eighths of the land is devoted to cotton, very little lying "turned out", and that, when rested, may yield one-half as much as it did when fresh. Cocklebur, tie-vine, crab-grass, and careless-weed form the most troublesome weeds.

Shipments are made early in the season, by rail or wagon, to Houston at from 50 cents to \$1 per bale.

LIBERTY.

(See "Long-leaf pine region".)

JEFFERSON.

Population: 3,489.—White, 2,290; colored, 1,199.

Area: 1,000 square miles.—Woodland, small part; long-leaf pine region, 270 square miles; marshes and southern prairie region, 730 square miles.

Tilled lands: 4,796 acres.—Area planted in cotton, 133 acres; in corn, 1,758 acres; in rice, 16 acres.

Cotton production: 77 bales; average cotton product per acre, 0.58 bale, 870 pounds seed-cotton, or 290 pounds cotton lint.

Jefferson, the extreme southeastern county of the state, has a surface quite level, and is watered by the Neches river and a number of small streams emptying into Sabine lake.

The northwestern part of the county has a sandy soil, and is timbered with the long-leaf pine of the lumber region, with some oak, hickory, magnolia, cypress, etc., on the streams. The rest is mostly an open prairie, with a few small patches of timber. The lands comprise both the black waxy and dark sandy soils, with underlying heavy concretionary clays of the Port Hudson age. These prairies are poorly drained and difficult to till, and are not much under cultivation. They are best adapted to stock-raising, being covered with excellent grasses.

Along the Gulf shore the lands are sandy, with some marshes on the east, bordering Sabine lake.

ABSTRACT FROM THE REPORT OF W. M. CAMPBELL, OF BEAUMONT.

The uplands comprise mostly level prairies, interspersed with small bodies of timber, consisting of hickory, elm, and hackberry. The lands devoted to the cultivation of cotton are the black waxy prairie, the black sandy, and the light or gray sandy soils. The most important is the *black waxy prairie*, which covers about one-half of the surface of the county; its soil is about 3 feet deep, over a yellow clay subsoil. It is difficult to till in wet seasons, is late and ill-drained, and produces corn, cotton, cane, and rice, the chief crop being corn. Cotton, forming about one-fourth of the entire crops planted, grows to a height of 3½ feet, and yields from 1,800 to 2,400 pounds of seed-cotton per acre, even after twenty years' cultivation. There is no tendency of the plant to run to weed. About one-half the land lies "turned out", and produces as well as it did originally when again taken into cultivation.

The *black sandy lands* constitute about one-third of the tillable area of the county, and the natural timber growth is post and black-jack oaks in spots, most of the land being prairie. The land is very easily cultivated in all seasons. The depth of the soil is 2 feet, with a compact yellow clay subsoil. Its productions are corn, cotton, cane, potatoes, rice, and fruits. It is early, warm, and partly well and partly ill drained. One-fourth of the crops is in cotton, which grows to a height of 3½ feet, yielding from 1,800 to 2,000 pounds of seed-cotton per acre. After ten years' cultivation the yield is reduced, being from 1,200 to 1,800 pounds, the rating being the same as before. One-half of the land lies "turned out", producing, when again cultivated, better than fresh lands.

The timber of the *light gray sandy lands*, which cover about one-twentieth of the county, is hackberry, gum, pin oak, ash, elm, bay, and magnolia. The soil is from 1 foot to 3 feet deep, and the subsoil is mostly a mixture of red sand and clay, though in some places it is similar to the surface soil. It is early, warm, and, like the previous soil, partly well and partly ill drained, producing corn, cotton, cane, rice, oranges, and grapes. About one-fifth of the cultivated land is devoted to cotton, which usually attains a height of from 3 to 8 feet, being most productive at 3 feet. In moderately wet seasons there is a tendency to run to weed, which is restrained by either topping the plant or by stopping the cultivation. The yield per acre of seed-cotton is from 1,200 to 2,400 pounds, which yield is reduced about one-third after the land has been cultivated for ten years. One-fourth of the land lies "turned out", the yield of which when again cultivated is equal to that from fresh land.

Shipments are made about the 1st of January by rail to Galveston, the rate being \$1 50 per bale.

ORANGE.

(See "Long-leaf pine region".)

CHAMBERS.

Population: 2,187.—White, 1,494; colored, 693.

Area: 850 square miles.—Woodland, very little.

Tilled lands: 3,336 acres.—Area planted in cotton, 140 acres; in corn, 1,839 acres.

Cotton production: 91 bales; average cotton product per acre, 0.65 bale, 975 pounds seed-cotton, or 325 pounds cotton lint.

Chambers, one of the Gulf counties, has a level and mostly open prairie surface, and is watered by Trinity river and several small streams, all emptying into Galveston bay. In the southern part of the county the soil is of a dark silty character, sandy along the coast, underlaid by heavy clays with calcareous concretions (Port Hudson). In the northern part these clays come near the surface, forming black waxy lands, intermixed with areas of sands; they are difficult to till, poorly drained, and are not much under cultivation. The alluvial lands of the river are rich and well timbered, but rather subject to overflow.

ABSTRACT FROM THE REPORT OF M. BYERLY, OF WALLISVILLE.

The uplands consist of prairie and timber lands. The black sandy land of Trinity bottom above overflow is the chief land of the county, the next in importance being the black prairie.

The *black sandy land*, covering about one-half of the county area, has a natural timber growth of pine, different kinds of oaks, hickory, and magnolia, and is underlaid by yellow, sticky clay at a depth of 3 feet. It produces corn, cotton, potatoes, and sugar-cane, though it is best adapted to cotton and cane. The black waxy soil is difficult and the black soil easy to till in wet weather, but all are easily tilled in dry seasons. The soils are early, warm, and badly drained. About one-quarter of the land is devoted to cotton, which grows to a height of about 4 feet, at which it is the most productive. Cotton inclines to run to weed in wet weather, topping being the remedy applied. The average product per acre in seed-cotton is 1,200 pounds, 1,780 pounds being required for a 475-pound bale of lint rating as middling. After one year's cultivation the yield is increased to 1,400 pounds per acre, but there is no difference in the quality of the staple. There is no danger from frosts in this county, as it is too far south. Bur and tie-vine are the weeds which occasion the greatest amount of trouble. No land lies "turned out".

GALVESTON.

Population: 24,121.—White, 18,454; colored, 5,667.

Area: 670 square miles.—Woodland, very little; all southern prairies.

Tilled lands: 2,790 acres.—Area planted in cotton, 289 acres; in corn, 655 acres; in oats, 44 acres.

Cotton production: 136 bales; average cotton product per acre, 0.47 bale, 705 pounds seed-cotton, or 235 pounds cotton lint.

Galveston, one of the Gulf counties, comprises the island of that name and a large area of the mainland. The surface of the country is very level, with a gradually ascending elevation inland from the shore. The county is almost entirely an open prairie, with a dark silty soil, except along the coast and on the island, where the surface is little less than a white sand. The lands are underlaid by a heavy clay containing white calcareous concretions (Port Hudson), which comes to the surface near Clear creek, the northern boundary of the county.

There is very little drainage to the lands, the water standing in pools on the surface during the rainy seasons, unable either to flow off or to find an underground passage through the impervious clays. For this reason the county, outside of the city of Galveston, is mostly devoted to stock-raising, and the grasses of the prairies are converted into hay. Along the streams there are some tillable lands having a black sandy loam soil and a growth of mesquite, pine, magnolia, etc.

The island of Galveston is about 32 miles long, with an average width of from 2 to 5 miles. Its surface is very level and sandy, with an elevation of from 2 to 10 feet above tide-water. But very little of the county is under cultivation, that is chiefly around the city of Galveston.

ABSTRACT FROM THE REPORTS OF SIDNEY SCUDDER AND WILLIAM J. JONES, OF GALVESTON.

The various lands devoted to the cultivation of cotton comprise buff-colored sandy loam on Galveston island, black sandy loam on the mainland prairies, and heavy black soil on the river banks.

The *black sandy loam* of the prairies is the most important, occupying about 80 per cent. of the county area, the natural timber growth being mesquite, magnolia, oak, cedar, pine, ash, and hackberry, lying mostly along the rivers. The soil is 3 feet 8 inches thick, with a subsoil consisting almost entirely of light sand, which extends to a depth of several feet. It produces cotton, sugar-cane, and potatoes, both Irish and sweet, is early, warm, and ill-drained, and is easily cultivated in all seasons. Cotton grows to a height of from 3 to 5 feet, yielding from 1,200 to 1,500 pounds of seed-cotton per acre. After five years' cultivation, unmanured and without rotation, there is a diminution of one-third in the yield. The fiber of the cotton grown on the coast is classed as being of a firmer and softer texture than that of inland counties, and matures very early. This is probably owing to a saline atmosphere and earlier seasons, the weather being essentially modified by the sea breezes. Sea-island cotton shows this more decidedly. In rainy seasons, more particularly in what is termed showery weather, the plant tends to run to weed, which may be restrained by topping. There are very few weeds of any description, crab-grass being the most troublesome. Very little land lies "turned out".

Shipments of cotton are made as soon as ginned, by wagon, to the nearest railroad station, and thence to the best markets, the rates depending on the distance.

FORT BEND.

(See "Brazos alluvial region".)

BRAZORIA.

(See "Brazos alluvial region".)

WASHINGTON.

Population: 27,565.—White, 12,845; colored, 14,720.

Area: 600 square miles.—Woodland and prairies; oak, hickory, and pine region, 200 square miles; southern prairies, 400 square miles.

Tilled lands: 139,712 acres.—Area planted in cotton, 58,705 acres; in corn, 43,610 acres; in oats, 776 acres; in wheat, 49 acres.

Cotton production: 20,692 bales; average cotton product per acre, 0.35 bale, 525 pounds seed-cotton, or 175 pounds cotton lint.

Washington county is bounded on the east by the Brazos river, to which most of the other and smaller streams are tributary. The surface of the county is rolling, its eastern and southern portions being mostly open prairies, which extend west to 3 miles beyond Burton, a railroad station, interspersed with timbered lands, that are also found on the north and west, and border the river bottoms. These prairies have soils varying from black waxy and hog-wallow clays to dark and brown sandy loams, and are underlaid by heavy clays with calcareous concretions, these, in turn, overlying the soft sandstones, as seen outcropping in the ravines and railroad cuts, and that prevail southward. The lands are rich and productive, though tilled with difficulty, and yield from 700 to 900 pounds of seed-cotton per acre. (See analyses, page 32.)

The timbered lands of the west and north belong to the large region of oak and hickory uplands that forms a diagonal belt nearly across the state from northeast to southwest. These lands are sandy and pebbly, with usually clay subsoils, and have a timber growth of post and black-jack oaks, and, with the timbered lands that skirt the streams, cover, it is estimated, about one-half the area of the county. The Brazos bottoms are wide and heavily timbered with walnut, ash, elm, pecan, etc., and have stiff red clay and loam soils. The undergrowth is usually very dense. The banks are said to be from 15 to 30 feet high and above the ordinary rise of the waters of the river. The lands are considered the best in the county, producing immense corn crops, and from 1,500 to 2,000 pounds of seed-cotton per acre.

Washington is well populated, and is the chief agricultural county in the state, its tilled lands covering 36.3 per cent. of its area, with an average of 232.8 acres per square mile. Its acreage devoted to cotton is also greater than that of any other county (97.8 per square mile), but in the number of bales produced it ranks as sixth in the state.

ABSTRACT FROM THE REPORT OF O. H. P. GARRETT, OF BRENHAM.

About two-thirds of the uplands of the county is perhaps prairie, reasonably good and productive, and with long and sufficiently rolling slopes. The lands devoted to cotton comprise Brazos bottoms, with red or chocolate-colored soils, and a timber growth of hackberry, ash, pecan, elm, walnut, cedar, and mulberry; black hog-wallow prairies, waxy and stiff, and dark, fine sandy loam.

The *sandy loam* is pleasant to till, and is the most desirable, covering more than one-fourth of the surface of the county. The soil is from 6 inches to 2 feet in depth, with a subsoil somewhat heavier, the chief crops being corn, cotton, oats, wheat, potatoes, and sorghum. About two-fifths of the tillable area is devoted to cotton, yielding from 1,000 to 2,000 pounds of seed-cotton per acre from fresh land. After several years' cultivation the yield is reduced to from 400 to 800 pounds. In the former case 1,545 pounds, and in the latter 1,600 pounds, are required for 475 pounds of lint, but the staple is not so good, being shorter from the long cultivated lands. In wet weather there is a tendency of the plant to run to weed, which is restrained by topping. Very little land lies "turned out", and when again cultivated, if well fertilized, it produces moderately well. There is considerable washing of the soil on slopes, which sometimes does serious injury to the uplands, but improves the valleys. Hillside ditching and horizontalizing are practiced, and are attended with beneficial results. Cocklebur is the most troublesome weed.

The soil of the *black waxy prairie* or hog-wallow and black sandy land is about 18 inches deep. Cotton constitutes about one-half of the crops planted, and usually attains a height of from 4 to 6 feet. After much rain there is a tendency of the plant to run to weed; topping is the remedy applied. The yield per acre of seed-cotton from fresh land is from 1,000 to 1,600 pounds, 1,545 pounds of which are required for a 475-pound bale, which rates as middling. Very little land lies "turned out". The cocklebur is the most troublesome weed.

Shipments are made from the middle of September to the middle of February, by rail, to Galveston and Houston.

AUSTIN.

Population: 14,429.—White, 10,490; colored, 3,939.

Area: 700 square miles.—Woodland, greater part; oak, hickory, and pine region, 170 square miles; southern prairies, 530 square miles.

Tilled lands: 73,492 acres.—Area planted in cotton, 31,321 acres; in corn, 26,810 acres; in oats, 519 acres; in wheat, 23 acres.

Cotton production: 13,185 bales; average cotton product per acre, 0.42 bale, 630 pounds seed-cotton, or 210 pounds cotton lint.

Austin county is bounded on the east by the Brazos river, and on the southwest by the San Bernard. Its surface is rolling, the northern part consisting mostly of open prairies, and the southern of timbered post and black-jack oak lands. The former comprises lands of a black and stiff clayey character, interspersed with brown sandy loams, and underlaid by heavy clay subsoils and sandstones (Grand Gulf). They are the chief cotton lands of the county, and cover, it is estimated, one-half of its area. The timbered region, or post-oak lands, lying south of Bellville, the county-seat, have gray sandy soils over heavy clay subsoils at 2 feet, similar in character to those of the prairies. They seem to be but little under cultivation.

The Brazos river bottom lands, several miles in width, are heavily timbered with ash, elm, pecan, walnut, etc., and have the usual red alluvial soils that are found throughout its length. The land under cultivation comprises 16.4 per cent. of the area of the county, and averages about 105 acres per square mile. Corn is the chief crop, with an average yield of from 15 to 20 bushels per acre.

Cotton, comprising 42.6 per cent. of the tilled lands, has an average of 44.7 acres per square mile, and its yield per acre is greater than that for the state at large.

ABSTRACTS FROM THE REPORTS OF MARTIN M. KENNEY, OF BELLVILLE, AND J. H. KRAUCHER, OF MILLHEIM.

The uplands of the county are rolling, and comprise black and sandy prairies on the north and timbered lands on the south. The sandy lands are usually on the tops of hills, and have a red subsoil, but the black lands of the valleys vary from black sandy to black waxy. The black waxy soil of Mill Creek bottom, because of overflow, is not much under cultivation.

The *black waxy prairie* is the chief cotton soil. It is a perfectly black, stiff clay, and when burnt forms a yellow brick. It changes to the less sandy and more sandy varieties in various localities, and occupies, with few exceptions, all of the northern and western parts of the county, or about one-half of its area. The natural growth of the prairie is grass, with a few scattering post and live oaks. The soil is from 1 foot to 6 feet, or on an average 2 feet deep. The subsoil is a gray or whitish clay, sometimes yellowish, with chalky gravel and thin strata of sandstone, or it is a red loam, which is the best. The gray or whitish clay contains great numbers of fossil bones, chiefly of a small animal of the horse kind. In some places the subsoil is leachy; in others it is an impervious hard-pan. The soil is difficult to cultivate when too wet or too dry, but easy in intermediate states. It is early, warm, and generally well drained, is best adapted to corn, cotton, and sugar-cane, and from one-half to three-fourths of its cultivated area is planted in cotton. The plant grows from 3 to 6 feet high, but is most productive at 4 or 5 feet. On rich or heavily-manured land (of this or other kinds) in wet seasons the plant inclines to run to weed, the remedy for which consists in close planting and topping about the first week in July. The seed-cotton product per acre of fresh land varies from 500 to 2,000 pounds, but the average is about 1,200 pounds, from 1,425 to 1,665 pounds making a 475-pound bale of low to good middling lint. After twenty years' cultivation (unmanured) the quantity and quality of the cotton product is the same. The troublesome weeds are cocklebur, careless-weed, crab-grass, wild hemp, and morning-glories. Slopes in old fields are seriously damaged by washing and gulying of the soils, and if these are sandy, and the material is washed down upon better valley lands, the latter are damaged by being overlaid with a poorer soil. To check these damages horizontalizing is practiced, which succeeds in some cases, but not always. The rains are so violent as often to break over the ridges and do more damage than if the rows were sloped.

The *sandy upland prairies* occur in irregular areas from latitude 30° to the Gulf, and from the Trinity to the Rio Grande rivers, occupying about one-fourth of the county area. The soil is a fine sandy loam of a reddish color, 24 inches thick, resting upon a hard, red clay subsoil, which becomes white at 30 feet deep, and is commonly called joint clay. It contains soft, white, angular, chalky gravel. In some places there is a stratum of water-worn quartz pebbles on this subsoil. Sand-rock underlies this clay. The soil is early, warm, well drained, easily tilled, and well adapted to almost all southern crops; it is enduring, and gives liberal returns for manuring. Some fields have been constantly cultivated for thirty years, and are still good. One-half the cultivated part of this land is planted in cotton, and the plant is most productive at its usual height of 3 feet. The seed-cotton product per acre of fresh land is 1,000 pounds in good seasons, 1,665 pounds making a 475-pound bale of low middling lint. Ten years' cultivation (unmanured) causes no decline in the quantity or quality of the product. Very little of this land lies "turned out", and it does not improve by fallowing, but grows up in sunflowers, nettles, and crab-grass, the two latter being the most troublesome weeds here.

The *sandy post-oak uplands* comprise about one-eighth of the county area, the other growth being black-jack, hickory, and some live-oak. Spots of it occur north of Bellville scattered over the sandy prairie, and the greater portion of the south and southeast part of the county is covered by it. The soil is mostly sandy, with gravel, the color varying from whitish to gray, buff, yellow, and orange-red, but lighter

colors prevail. The depth is 2 feet. The subsoil is generally yellow or red loam or clay, always heavier than the surface soil, and mostly impervious when undisturbed. It contains a variety of gravel, and sometimes "iron pebble" and small shells, and is underlaid by sand, gravel, ironstone, and hard sandstone at 6 feet and less. Tillage is generally easy, but in wet seasons the soil is frequently boggy, and in dry seasons it becomes hard in many places. The soil is late, warm when well drained, and best adapted to sweet potatoes and cotton. Three-fourths of its cultivated area is planted in cotton. The plant grows from 2 to 4, or, if well manured, from 6 to 7 feet high, but inclines to run to weed in good seasons on heavily-manured land, which may be prevented by close planting and topping. The seed-cotton product per acre of fresh land varies from 400 to 1,000 pounds, from 1,545 to 1,665 pounds making a 475-pound bale of middling to good ordinary lint. Two years' cultivation (unmanured) cause a decline of 50 per cent. in the cotton yield; more is needed to make a bale, and the staple is inferior, generally very short, and without the fine gloss. Crab-grass, morning-glory, crowfoot, etc., are the troublesome weeds. But a small amount of such land lies "turned out", but by manuring it can be made to equal or even exceed its original yields.

The *Brazos bottom* occupies about one-eighth of the county area, and from four- to five-tenths of its cultivated area is planted in cotton. The bottom averages 3 miles, sometimes 5 or 6 miles wide, and its red-clay alluvium, brought from the Staked Plain, is 50 feet deep and very rich, producing an average of 2,000 pounds of seed-cotton per acre, and more in some places, or 40 bushels of corn. All southern crops grow luxuriantly upon it. The soil is light, warm, early, usually well drained, and easily cultivated, and cotton does not die out upon it. These 50 feet of alluvium rest upon a mixture of clay and coarse sand, gray in color, containing skeletons of the mammoth in great numbers. The bottom has a great variety of natural growth, among which are oaks, ash, walnut, mulberry, pecan, elm, hackberry, etc. The troublesome weeds are wild hemp and other tall growers.

The seasons are irregular as to the amount and time of rainfall, and this is perplexing to the planter. On the uplands the rows are made 4½ feet apart and the plants 18 inches apart in the drill. If the season happens to be dry, the plants are too thin on the ground; if wet, they are too thick; but these conditions cannot be known until the after-cultivation is nearly completed. The climate is generally favorable to the production of all upland varieties of cotton. To produce the best crop of the best staple not much rain is needed, the average summer, with just enough rain to keep the plant in a growing condition, being sufficient. The chief crops of this region are cotton, corn, sweet potatoes, sorghum, and ribbon cane.

Cotton is shipped during picking time, by rail, chiefly to Galveston, at \$1 40 per bale from Millheim, or \$2 from Bellville.

FAYETTE.

Population: 27,996.—White, 19,167; colored, 8,829.

Area: 960 square miles.—Woodland, greater part; oak, hickory, and pine uplands, 750 square miles; southern prairie, 210 square miles.

Tilled lands: 137,218 acres.—Area planted in cotton, 58,353 acres; in corn, 47,770 acres; in oats, 1,023 acres; in wheat, 265 acres.

Cotton production: 24,766 bales; average cotton product per acre, 0.42 bale, 630 pounds seed-cotton, or 210 pounds cotton lint.

The surface of Fayette county is rolling, about equally divided between prairies and timbered lands, and is watered by many streams, most of which are tributary to the Colorado river, which flows through the central part of the county in a northwest and southeast course. The river is bordered by wide bottom lands, heavily timbered with cottonwood, ash, walnut, elm, etc., and have soils varying from reddish sandy to dark alluvial loams, underlaid by beds of concretionary clays, that outcrop occasionally on the banks. These lands are very productive, and are largely under cultivation.

The uplands are high and rolling, and comprise broad skirts of post-oak timber along the river and creek bottoms, large and open prairies on the north and south, and other post-oak lands on the north and northwest, interspersed in smaller areas throughout the county. (See analysis, page 32.)

The lands of the timbered region are sandy and often gravelly, and are filled with variously colored and rounded quartz and agate pebbles. They, as also the prairies, are underlaid by concretionary clays and sandstones, that are frequently found outcropping in the banks of ravines. A high sandstone bluff occurs on the river opposite the town of La Grange, the county-seat. These lands are easily tilled and quite productive, except where the concretionary clays come near the surface, rendering drainage poor, and causing cotton and deep-rooted crops to die, even when near maturity. They have a growth of post and black-jack oaks, pine, hickory, etc., and in places the former is open and almost the exclusive tree.

The prairies have soils varying from black waxy and hog-wallow clays to brown, sandy loams, with underlying heavy clays and sandstones. While very productive, they are generally preferred for grazing purposes. (See analysis, page 32.)

The county has 22.3 per cent. of its area under cultivation, with an average of 142.9 acres per square mile. Of the latter, 60.8 acres are devoted to cotton, the chief crop of the county.

ABSTRACT FROM THE REPORT OF HENRY B. RICHARDS, OF LA GRANGE.

The uplands of the county are rolling, and comprise black prairies and sandy timbered lands; but the latter, with thin, poor soils, are not well adapted to cotton. The cotton lands comprise the shelly bottom lands of the Colorado river and creeks, the black hog-wallow prairie uplands, and the black sandy prairies. The chief crops of this region are cotton, corn, and sweet potatoes.

The *bottom lands*, embracing about 30 per cent. of the cultivated area, have a natural timber growth of live, pin, and white oaks, elm, ash, box-elder, red cedar, cottonwood, sycamore, pecan, etc. The soil is a brown and blackish, fine silty loam containing small shells, and is 30 inches thick. The underlying material is gravel, large and small, with cobblestones down to 30 or 35 feet, where it rests upon a stiff, impervious clay. The soil is early, warm, and well drained, always easily tilled, and is best adapted to cotton. One-half of its cultivated area is planted with the same. The cotton-plant usually grows from 4½ to 5 feet high. In wet seasons (on other good soils as well) the plant inclines to run to weed, which is remedied by topping in mid-season or when 2 or 2½ feet high. The average seed-cotton product per acre of fresh land is from 600 to 800 pounds, 1,600 pounds making a 475-pound bale of low middling lint. Fifteen years of good cultivation (unmanured) make no difference in the average quantity or quality of the cotton product. Cocklebur and morning-glory vines are the most troublesome weeds. No such land lies "turned out" at present.

The "hog-wallow" prairies occur in large bodies, and comprise one-half the cultivated area. Their natural growth is grass. The soil is a blackish and black clayey loam, putty-like when wet, from 2 to 4 feet thick; the subsoil a reddish clay, in some places gravelly (white, rounded, angular, hard, and soft), and is always underlaid by clays at from 25 to 30 feet. The soil is late, cold, ill-drained, and tillage is difficult when it is wet, but easy when dry. With good cultivation it yields best in dry seasons. It is best adapted to corn and cotton, and these alone are planted, one-third of the cultivated area being in cotton. The plant grows from 2 to 5 feet high, and is most productive at 5 feet. After ten years' good cultivation (unmanured) the average seed-cotton product per acre is from 400 to 600 pounds, 1,600 pounds making a 475-pound bale of low middling lint, whether from fresh or old land. The product per acre of fresh is less than that from old land of this kind. No land lies "turned out". Cockleburs and morning-glory vines are the troublesome weeds.

The sandy prairie and post-oak lands occur sometimes in long, narrow belts, and sometimes in large bodies, several miles in diameter, and comprise 20 per cent. of the tillable area. The timbered portion bears live and other oaks; the prairie is covered with considerable grass. The soil is various—fine and coarse sandy or gravelly and whitish gray, buff, or mahogany in color. It is 6 inches thick, and is underlaid by leachy sand and gravel in variety, and these again by pipe-clay and rock at from 1 foot to 10 feet. This soil is early, warm, and well drained, and always easily tilled. It is not productive farming land, although one-half its cultivated area is planted in cotton, and the other half in corn and potatoes. The cotton-plant grows from 1 foot to 3 feet high, but is most productive at 3 feet. The seed-cotton product per acre of fresh land is from 300 to 600 pounds, 1,600 pounds making a 475-pound bale of low middling lint. After ten years' cultivation (unmanured) the product is about 100 pounds. None of this land lies "turned out". Crab-grass is the troublesome weed. The slopes are seriously damaged by washing and gullying, but the washings do not injure the valleys. No efforts are made to check the damage.

The earliest planting produces the largest yields in favorable seasons, but early planting is liable to be killed by late frosts. These are more disastrous to the crop than anything else.

Cotton is shipped as fast as it is baled, by wagon, to the railroad station at \$1 per bale, thence to Houston at \$2 25, or to Galveston at \$3 per bale.

COLORADO.

Population: 16,673.—White, 8,987; colored, 7,686.

Area: 900 square miles.—Woodland, about one-third; oak, hickory, and pine region, 230 square miles; southern prairie, 670 square miles.

Tilled lands: 96,865 acres.—Area planted in cotton, 32,994 acres; in corn, 29,711 acres; in oats, 227 acres; in sugar-cane, 161 acres.

Cotton production: 15,552 bales; average cotton product per acre, 0.47 bale, 705 pounds seed-cotton, or 235 pounds cotton lint.

Colorado county is divided into two parts by the Colorado river, and Big Bernard creek forms the eastern boundary. The surface of the county is undulating, with a gradual fall toward the south, and the larger streams on the east, middle, and west pursue their way independently to the coast. Eagle lake, in the southeastern part of the county, has a surface of about 4,000 acres. The river lands are broad, well timbered with live oak, pecan, ash, walnut, hackberry, etc., and have a dark alluvial soil about 2 feet in depth, underlaid by clay loams and clays, and at 12 feet by sandstone. These lands are largely under cultivation, and yield from 800 to 1,200 pounds of seed-cotton per acre.

The uplands of the county are mostly open prairies, diversified with skirts of timbered lands, and have soils varying from black waxy and hog-wallow clays to black and gray sandy loams of both prairies and timbers. They are underlaid by heavy concretionary clays and sandstones, and beds of variously colored quartz pebbles frequently appear near the surface. The black prairies occupy the highest lands, while on the lowlands the soils are sandy, probably from the sandstone under the clays, and are timbered with a post- and live-oak growth.

The prairies are mostly given up to purposes of stock-grazing, for which they are admirably suited. The river lands are, to some extent, devoted to the culture of sugar-cane, the predominant crop of all of the alluvial lands of the Colorado and Brazos rivers on the south.

The population of the county is largely composed of Germans, an industrious and thrifty people, who immediately adopt the usual methods of farming—at first renting the land, and very soon buying for themselves.

The lands of the county under cultivation comprise 16.8 per cent. of its area, or an average of 107.3 acres per square mile. Cotton is the chief crop, with an average of 36.7 acres per square mile, or 34.1 per cent. of tilled lands, and its yield per acre is greater than in most of the counties in the southern prairie region. That of corn is from 18 to 25 bushels, and of oats from 25 to 30 bushels per acre.

ABSTRACTS FROM THE REPORTS OF W. T. M'LEARY, M. D., JOHN KNIPSCHER, AND F. BOETTCHER, OF WEIMAR, AND OF W. H. CARLTON, OF COLUMBUS.

The uplands of the county are rolling and level, comprising timbered lands and prairies, and have soils varying from gray sandy to black waxy. The lowlands comprise the first and second bottoms, and also the bottom prairies adjacent to Colorado and Navidad rivers and other streams.

The Colorado river bottoms are the best and most productive lands, and comprise both sandy and black clayey and reddish clay loams. They bear a natural timber growth of cottonwood, ash, hackberry, elm, pecan, walnut, and wild peach. The soil is 5 or more feet deep; the subsoil is a black clay, called joint clay. Tillage is a little hard when the soil is wet, but otherwise very easy. The soil is early, warm, and naturally well drained, and is best adapted to cotton, corn, sugar-cane, oats, and sweet and Irish potatoes. From one-half to two-thirds of its cultivated area is planted in cotton. The plant grows from 5 to 7 feet high, and inclines to run to weed in wet seasons and when too closely planted; topping will check its growth and cause it to limb heavily. The seed-cotton product per acre of fresh land or after six years' cultivation (unmanured), the soil being in good condition, is from 1,500 to 1,800 pounds, 1,485 pounds making a 475-pound bale of lint, the staple being as good as any. The cocklebur is the most troublesome weed. Very little of this land is "lying out", and it recovers to some extent from the effects of bad farming and again produces very well if well managed.

The black prairie occupies about one-third of the county area. The soil is from 2 to 5 feet deep; the subsoil is heavier, a clay hard-pan, somewhat leachy, underlaid by sand and rock at from 10 to 20 feet. Tillage is difficult only when the soil is very wet or dry. The soil is early, warm, and well drained, and is best adapted to cotton, corn, and potatoes. One-third of its cultivated area is planted in cotton,

which grows 4 or 5 feet high. The seed-cotton product per acre during the first six years of cultivation is 1,600 pounds if the ground is in good condition, 1,545 pounds making a 475-pound bale of middling lint from the fresh or of good middling from the old land, the staple being longer in the latter case. The troublesome weeds are careless-weed, and in old fields cocklebur and sometimes morning-glories.

The *sandy prairie* occupies about two-fifths of the county area. Distributed over it are bodies of timber, consisting of post, black-jack, and a few live oaks, with soils like the prairie. The color of the soil extends from 4 to 12 inches below the surface; the subsoil is heavier but leachy, and is underlaid at 20 feet by sand, gravel, and rock. Tillage is always easy, the soil being early and warm, but not always well drained. The soil is best adapted to corn, cotton, and potatoes, but one-half of its cultivated area is planted in cotton. The plant grows from 2 to 4 feet high, but is most productive at 4 feet. The average seed-cotton product per acre is from 600 to 700 pounds on fresh land, 1,665 pounds making a 475-pound bale of good ordinary lint. After six years' cultivation (unmanured) the product is scant 600 pounds, and 1,780 pounds make a 475-pound bale of somewhat inferior lint. Crab-grass and, in some places, bur-grass are the troublesome weeds. Very little of such land lies "turned out", and does not appear to have improved by resting.

This land is thickly settled, and endures drought well. A few years ago it was considered worthless; now some of the best farmers make a 500-pound bale per acre. By careless management slopes are allowed to become seriously damaged by washing and gullyng, and horizontalizing is practiced with success, but it is troublesome. "Hillside ditching should be begun immediately, and for that purpose I have had the first level in this country constructed, and will set the example to save our lands. In Tennessee before the war all of our slopes were successfully protected against such damages by hillside ditching" (*McLeary*).

The washings improve *valley lands*, except when it consists of sand; it then ruins such lands in many cases. The chief crops of this region are corn, cotton, oats, potatoes, peaches, pecans, pumpkins, melons, and other early garden products of good quality, and in abundance.

The climate is generally favorable to cotton growing; but there is an occasional cold, wet spring, when rust and aphides appear, and sultry, showery weather in May and June, which are likely to be followed by the caterpillar. Dry seasons are best for cotton on the river bottom, and even on the prairies moderately dry is best. There are occasionally frosts as late as April, which kill cotton and corn; and dry weather is apt to check the growth of late corn.

Cotton is shipped from September to March, by rail, from Weimar to Galveston at \$3 25, or to Houston at \$2 50 per bale. Thence it sometimes goes to New York.

LAVACA.

Population: 13,641.—White, 10,221; colored, 3,420.

Area: 1,000 square miles.—Woodland, little less than one-half; oak, hickory, and pine region, 480 square miles; southern prairie, 520 square miles.

Tilled lands: 94,970 acres.—Area planted in cotton, 25,728 acres; in corn, 28,474 acres; in oats, 789 acres; in wheat, 94 acres.

Cotton production: 9,976 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

The surface of Lavaca county is undulating, with a gradual fall southward, and about one-half is timbered with post and black-jack oaks, the rest being mostly open prairies.

The various streams flow south and southeastward, and are timbered with elm, cottonwood, hackberry, etc. Their bottom lands are subject to overflow, and are not under cultivation; but their second bottoms or valley lands have a dark alluvial soil, and are highly productive.

The prairie uplands lie chiefly in the northern part of the county, and extend west to the Guadalupe river, though the timbers of the south are somewhat interspersed with them. Their soils vary from black waxy clays to dark sandy loams, and are underlaid by the heavy concretionary clays and sandstones that characterize the southern prairie region.

The timbered lands have usually an open growth of post and black-jack oaks and a sandy, sometimes pebbly soil and clayey subsoil, with the underclays that underlie the prairies. They are easily tilled, and produce an average of about 500 pounds of seed-cotton per acre. The pecan tree is a prominent growth of the uplands of the county, and furnishes a large supply of this nut to the markets.

Lavaca is an agricultural county, 14.8 per cent. of its area being under cultivation, with an average of 95 acres per square mile. Of the latter, 25.7 acres are given to the culture of cotton. Corn is, however, the chief crop of the county.

ABSTRACTS FROM THE REPORTS OF JOHN WILLIAMS, OF WILLIAMSBURG, AND HENRY K. JUDD, OF HALLETTSVILLE.

The surface of the county is rolling, and consists of sandy, timbered post-oak lands and the open prairies. The latter comprise stiff hog-wallow and black sandy soils. The lowlands consist of the first and second bottoms of Navidad and Lavaca rivers, and have rich black and yellow sandy soils, well adapted to the cultivation of cotton and corn. The first bottoms are not used, on account of overflow.

The soil of the *bottom lands* is prevalently a black, alluvial loam, with a depth of from 10 to 48 inches. Its area forms one-eighth of the county, and its growth is pecan, elm, cottonwood, hickory, live, post, and burr oaks, hackberry, mulberry, wild peach, and a variety of undergrowth. The subsoil is a heavy limy or chalky clay. This land is best adapted to corn, cotton, oats, and ribbon-cane; but about one-half of its cultivated area is planted in cotton. The plant grows from 3 to 5 feet high, but is most productive at 4 feet. It inclines to run to weed in warm, wet weather, the only remedy used being cutting off the top bud. The seed-cotton product per acre of fresh land varies from 900 to 1,500 pounds, 1,545 pounds making a 475-pound bale of middling lint. The cotton product is, after ten years' cultivation (unmanured), reduced to one-half. The lint is shorter, and $3\frac{1}{2}$ pounds of seed-cotton make 1 of lint. Cockleburs, crab-grass, morning-glory, and careless-weeds are most troublesome.

The *prairie uplands* occur in bodies of from 10 to 100 acres or more. The northern part of the county is chiefly prairie. The prairie area occupies about one-half of the county. The soil is chiefly black "hog-wallow", with more or less brown sandy soil, and is from 13 to 60 inches deep, generally resting on soft limestone or chalk. The soil is difficult to till in extremes of wet or dry weather, but ordinarily it is easy to till. It is early, warm, and well drained, and best adapted to corn and the smaller cereals, but one-half of the area is planted in cotton. The plant grows from 2 to 3 feet high. The seed-cotton product per acre of fresh land, or that cultivated twenty years (unmanured), is alike from 900 to 1,500 pounds, and in either case 1,665 pounds make a 475-pound bale of middling lint. Cockleburs are the most troublesome weeds.

The light sandy *post-oak uplands* are distributed in bodies among the prairies, and occupy about one-fourth of the county area. The natural growth is post and black-jack oaks. The soil is from 6 to 24 inches deep, and the subsoil is a heavy clay. Tillage is always easy. The soil is early, warm, well drained, and best adapted to cotton, and one-half its cultivated area (which is small) is planted with the same. The plant grows from 1 to 3 feet high. The seed-cotton product per acre of fresh land is from 500 to 1,000 pounds, 1,545 pounds making a 475-pound bale of middling lint, either from fresh or old land. The most troublesome weed is crab-grass. Such lands are now attracting more attention, as they are considered to be excellent cotton lands. The soils (especially subsoils) of slopes wash and gully to some extent, but no serious damage has yet resulted, and no efforts have been made to check the same. The washings rather improve than injure the valleys.

The chief crops of this region are cotton, corn, oats, rye, barley, sweet and Irish potatoes, millet, ribbon-cane, and sorghum; wheat occasionally succeeds.

As soon as baled cotton is hauled to the nearest railroad station, at \$1 per bale, and sold; thence shipped to Galveston at \$3 per bale.

GONZALES.

(See "Oak, hickory, and pine region".)

DE WITT.

Population: 10,082.—White, 7,144; colored, 2,938.

Area: 900 square miles.—Woodland, about one-third; oak, hickory, and pine region, 300 square miles; southern prairie, 600 square miles.

Tilled lands: 41,792 acres.—Area planted in cotton, 7,625 acres; in corn, 19,148 acres; in oats, 639 acres; in wheat, 500 acres.

Cotton production: 2,183 bales; average cotton product per acre, 0.29 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

De Witt county has a surface of partly rolling and partly level prairie and timbered lands, and is divided by the Guadalupe river, which flows in a southeastern course.

The extreme northern part of the county is composed of high and rolling prairies, with rocky sandstone knobs. (Grand Gulf) and usually gray and sandy soils. Southward toward Cuero, the county-seat, the surface of the country falls, and at Hellgate ferry, 4 miles north of the town, the last outcrop of the sandstone is seen, with an exposure 10 feet in thickness, through which the waters of the river have cut a passage.

Still southward appear the black hog-wallow prairies, that extend to the coast and are underlaid by concretionary clays (Port Hudson). This part of the county is more level, but has a gradual fall toward the coast.

Post-oak sandy lands occur in large areas throughout the county, and heavy beds of sand are found in some localities, especially near the river between Cuero and Clinton. The prairies are largely devoted to stock-raising.

ABSTRACT FROM THE REPORT OF A. G. STEVENS, OF CONCRETE.

About one-half of the uplands is prairie. The lands devoted to the cultivation of cotton comprise the black waxy and black sandy prairie, the light sandy loam, and the very light sandy timbered lands. The timbered uplands have a growth of post oak. The bottom lands have a width of from one-half mile to 2 miles, and a growth of elm, hackberry, burr oak, pecan, and cottonwood.

The *black sandy prairie* is preferred for cotton. The soil is from 3 to 5 feet in depth, and its chief crops are corn, cotton, and oats. About one-third of the tilled land is in cotton, which grows to a height of 4½ feet, and yields 1,500 pounds of seed-cotton per acre, 1,665 pounds making 475 pounds of middling to good middling lint. After ten years' cultivation no material change is noticed in the yield, but the rating of the staple is one grade lower. The most troublesome weeds are cocklebur and blood-weed. The late frosts often do injury to the cotton. Very little land lies "turned out".

The *light sandy loam*, covering about one-fourth of the county, has a natural timber growth of mesquite and post oak. The soil is from 8 to 15 inches deep, with a subsoil of red and joint clay, and the yield is from 1,000 to 1,200 pounds of seed-cotton per acre after ten years' cultivation.

Shipments are made by railroad from Cuero to Galveston and New York, the rate to the latter place being \$5 per bale.

WHARTON.

(See "Brazos alluvial region".)

VICTORIA.

Population: 6,289.—White, 3,883; colored, 2,406.

Area: 880 square miles.—Woodland, but little; all southern prairies.

Tilled lands: 24,395 acres.—Area planted in cotton, 1,739 acres; in corn, 6,253 acres; in oats, 174 acres; in wheat, 28 acres.

Cotton production: 730 bales; average cotton product per acre, 0.42 bale, 630 pounds seed-cotton, or 210 pounds cotton lint.

The surface of Victoria county is undulating on the north, becoming quite level southward, and is watered by the Guadalupe and San Antonio rivers and a number of large creeks, some of which flow independently into Lavaca bay. Black and sandy prairies cover the greater part of the county, and are very generally devoted to the grazing of stock. (See analysis, page 32.) They are underlaid by the heavy concretionary clays of this region. The streams are bordered by narrow sandy uplands, timbered with post and live oaks or by mesquite prairie flats, which have a deep black waxy soil.

The bottom lands of the rivers are narrow and heavily timbered with pecan, ash, oaks, hackberry, mulberry, etc., and have a dark sandy alluvial soil, rich and very productive. The lands under cultivation comprise but 4.3 per cent. of the county area, and but a small part of these is devoted to the culture of cotton. The average yield of this crop is above that of the state. The farmers are chiefly Germans, who have devoted most of their tilled lands to crops other than corn and cotton.

ABSTRACT FROM THE REPORT OF THOMAS R. COCKE, M. D., OF VICTORIA.

The uplands consist of black hog-wallow prairie and rolling lands, mostly the former, which constitutes the most important land devoted to the cultivation of cotton. The gray shelly lands of the river bottoms above overflow, the light sandy near the creek, and the post-oak land form the remainder of the lands so applied.

The *black hog-wallow* and *black sandy prairie lands* cover about five-eighths of the county; continuous hog-wallow tracts of 8 or 10 miles is very usual in this region, the intermediate soil being sandy. The soil is a black sandy loam, varying in depth from $2\frac{1}{2}$ to 5 feet, with a subsoil of yellow joint clay, replaced in some cases by shell and marl. If the land is well broken up in the winter or fall, it is very easily cultivated, producing corn, sugar-cane, and cotton. Small grain crops are being tried; oats do well. Owing to labor being so unreliable, only one-tenth of these lands is in cotton, which grows to a height of 4 feet, though when well branched it attains 5 or 6 feet, the last being the most productive. The yield is 1,800 pounds of seed-cotton per acre, and 1,900 pounds are required for 475 pounds of lint, which rates as middling. Thirty years' cultivation causes no change in the yield, but the staple is shorter, stronger, and heavier. Wet weather causes the plant to run to weed, which to some extent is restrained by topping. About five-eighths of the land lies "turned out", grazing being substituted for cultivation. Crab-grass, careless-weed, and cocklebur are the most troublesome weeds, the first being the worst enemy to cotton planting.

The lands adjoining the river, as well as those of the river bottoms, differ very materially from those of the creeks, the former being gray and black alluvium, from 6 to 8 feet deep, the latter a light sandy soil, either yellow or gray, on a red-clay subsoil. The cotton on the low lands free from overflow grows much higher and produces from 25 to 33 per cent. more to the acre; it is not injured by the winds, and the fiber, though not quite so fine, is stronger and longer than on the uplands.

The *gray shelly lands* of the river bottoms cover about one-eighth of the county, and have a timber growth of buckeye, white oak, and pecan, and an undergrowth of grape and other vines. The soil is a gray sandy loam, 10 feet deep, over yellow joint clay from 4 to 6 feet in depth. It is early, warm, well drained, easily tilled in all seasons, and well adapted to cotton, corn, and sugar-cane, one-tenth of the area planted being devoted to cotton, which yields from 1,800 to 2,500 pounds of seed-cotton per acre, 1,305 pounds being necessary for 475 pounds of lint, which rates as middling. It usually attains a height of 5 or 6 feet. The yield is not altered after the land has been under cultivation for thirty years. About four-fifths of the land lies "turned out". Wet seasons on the lowlands are the cause of mildew, which may be obviated by planting farther apart; topping is applied to restrain the running to weed, which occurs when there is too much rain. The most troublesome weeds on this soil are cocklebur, careless-, and blood-weed.

The *light sandy soil* lying along the creeks comprises about one-fourth of the tillable area, and has a timbered growth of post, black-jack, and live oaks. The soil is a grayish, fine, or coarse sandy loam, 15 inches in depth, with a red-clay subsoil occasionally mixed with clay or marl, contains ferruginous pebbles, and is underlaid by sand or gravel. The soil is early, warm, well drained, easily tilled in dry seasons, and best adapted to cotton, tobacco, potatoes, and fruit. One-sixteenth of the entire crops is cotton, which grows to a height of 3 feet in good seasons, and yields 1,000 pounds of seed-cotton per acre, 2,140 pounds being requisite for 475 pounds of good middling lint. After three years' cultivation the yield is sensibly diminished, as is also the rating of the staple, and 2,380 pounds are necessary for 475 pounds of lint. One-quarter of the land lies "turned out", and when again cultivated produces about $87\frac{1}{2}$ per cent. of the original product. This character of soil has never been extensively cultivated. The soil washes on the slopes, doing considerable damage to the valleys, and horizontalizing is practiced with fair success to check the damage. Crab-grass is the most troublesome weed.

Cotton is hauled by wagon as soon as baled to Victoria.

JACKSON.

Population: 2,723.—White, 1,310; colored, 1,413.

Area: 900 square miles.—Woodland, probably one-third; all southern prairies.

Tilled lands: 8,829 acres.—Area planted in cotton, 648 acres; in corn, 3,787 acres; in oats, 45 acres.

Cotton production: 202 bales; average cotton product per acre, 0.31 bale, 465 pounds seed-cotton, or 155 pounds cotton lint.

The surface of Jackson county is undulating, and is watered by numerous streams flowing southward into Lavaca and other bays. These streams are timbered with oak, elm, ash, pecan, hackberry, wild peach, some hickory, etc. The rest of the county is mostly open prairies, and comprises, it is thought, two-thirds of the entire area. The lands of the timbered areas are sandy, those of the prairies varying from black, waxy clays to dark, sandy loams. The crops of the county are corn, cotton, oats, vegetables, etc. Jackson is principally a stock-raising county, and but 1.5 per cent. of its area is under tillage, the average being 9.8 acres per square mile.

Corn is the chief crop, with a yield of from 10 to 20 bushels per acre. Very little cotton is produced. Wild mustang grapes are said to be abundant. The methods of cotton culture are the same as in the adjoining counties. Shipments are made by boat down the bay to Indianola, and thence by steamer to Galveston.

ABSTRACT FROM THE REPORT OF GEORGE F. HORTON, OF TEXANA.

The soils of the county are very equally divided between sandy and black waxy. Five living streams water the county, passing through its entire length, and about 8 miles apart; they are well timbered on either side from one-fourth of a mile to 2 miles. The sandy lands occur in this timbered portion, while the black, waxy lands occupy the open intermediate prairies.

MATAGORDA.

Population: 3,940.—White, 1,416; colored, 2,524.

Area: 1,400 square miles.—Woodland, very little; southern prairie loam, 1,380 square miles; alluvial, 20 square miles.

Tilled lands: 17,917 acres.—Area planted in cotton, 3,435 acres; in corn, 4,747 acres; in oats, 14 acres; in sugar-cane, 300 acres.

Cotton production: 2,096 bales; average cotton product per acre, 0.61 bale, 915 pounds seed-cotton, or 305 pounds cotton lint.

Matagorda is one of the coast counties, and its surface is quite level, comprising mostly open prairies, with timbered lands along the Colorado river, Cany creek, and other streams that flow south into Matagorda bay. The lands of the prairies present the variety of black waxy and hog-wallow clays to dark sandy loams usual to the southern prairie region, and are underlaid by heavy concretionary clays. They are almost exclusively given up to grazing purposes.

The lands of the Colorado river and Cany creek are several miles in width, and are heavily timbered with cottonwood, pecan, elm, ash, mulberry, hackberry, etc., and noted for their richness and high productiveness. Their soils are mostly red and black alluvial loams, capable of producing from 1,500 to 2,000 pounds of seed-cotton per acre. Sugar-cane is one of the chief crops of these lands, and in 1879 yielded 270 hogsheads of sugar and 20,000 gallons of molasses from 300 acres.

Matagorda is a sparsely populated county, and but a small part (2 per cent.) of its lands is under cultivation, the average being 12.8 acres per square mile. Its cotton acreage is comparatively small, though in product per acre it ranks as fifth in the state. The methods of cotton culture are the same as practiced in the adjoining counties.

Shipments are made by steamer from the port of Matagorda to Galveston and other points.

KARNES.

Population: 3,270.—White, 2,780; colored, 490.

Area: 730 square miles.—Woodland, about one-half; oak, hickory, and pine region, 330 square miles; southern prairie, 400 square miles.

Tilled lands: 51,393 acres.—Area planted in cotton, 1,607 acres; in corn, 5,184 acres; in oats, 48 acres; in wheat, 52 acres.

Cotton production: 283 bales; average cotton product per acre, 0.18 bale, 270 pounds seed-cotton, or 90 pounds cotton lint.

Karnes, though included among the prairie counties of southern Texas, is largely covered with the timber of the oak and hickory uplands of the eastern part of the state, which terminates here, and is associated with a mesquite growth. South and east of Helena, the county-seat, there are chiefly prairies, with soils varying from the black calcareous and hog-wallow to the dark sandy, and underlaid by heavy clays. The timbered lands are mostly sandy, and have a growth of post oak. The surface of the county is generally level or undulating, and is watered by the Medina river and its tributaries, which flow in a southeasterly course. It is sparsely settled, and the people are largely engaged in stock-raising.

A small proportion of the lands under cultivation is devoted to the culture of cotton, and the yield for 1879 was very low, viz, 270 pounds of seed-cotton per acre. The methods of tillage, etc., are the same as practiced in the adjoining counties. Cuero, in De Witt county, is the nearest market, to which place cotton is hauled on wagons, and thence shipped, via Indianola and the Gulf, to Galveston and other points.

ABSTRACT FROM THE REPORT OF THOMAS BUCKMAN, OF HELENA.

The surface of the county is rolling, partly prairie and partly timbered. The most important soil is a *black, stiff prairie*, partly hog-wallow, covering one-fifth of the county, the latter occurring in spots all over the county, the natural timber growth being a scattering one of post and live oaks and mesquite. Hackberry, pecan, cottonwood, and mulberry lie on the bottoms. The soil is 2 or 3 feet deep, with a heavy blue-clay subsoil. It is early, warm, well drained, easily cultivated, and produces chiefly corn and cotton. About one-quarter of the farming land is devoted to cotton, which attains a height of from 4 to 6 feet, inclines to run to weed in wet seasons, and yields 1,200 pounds of seed-cotton per acre, 1,520 pounds being necessary for 475 pounds of lint, which rates as low middling. No land lies "turned out". Sometimes the plant continues to yield until near Christmas. In rainy seasons it is troubled with web worms, which web up and hatch out every six weeks, increasing with every hatching. Cultivation of the land does not seem to diminish the yield of seed-cotton. The climate is well adapted to the growth of cotton, because of long seasons and not too much rain.

Shipments are made in winter by railroad from the nearest station to Galveston at \$2 25 per bale.

WILSON.

(See "Oak, hickory, and pine region".)

ATASCOSA.

Population: 4,217.—White, 3,938; colored, 279.

Area: 1,200 square miles.—Woodland, little more than half; oak, hickory, and pine region, 680 square miles; southern prairie, 520 square miles.

Tilled lands: 14,744 acres.—Area planted in cotton, 1,422 acres; in corn, 4,475 acres; in oats, 93 acres.

Cotton production: 469 bales; average cotton product per acre, 0.33 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

Atascosa is an undulating or somewhat rolling county, watered by a number of creeks tributary to the Nueces river. It is about equally divided between prairie and timbered lands, the latter, known as the black-jack country, being covered with a growth of post and black-jack oaks, hickory, and mesquite, with cottonwood, pecan, willow, etc., along the streams. The soils vary from the sandy loam of the prairies to the deep sands of the timbers, and are underlaid by clays.

The county is sparsely settled, and the chief industry is raising stock, especially sheep, for which the mesquite grasses of the prairies seem to be admirably suited. The amount of tilled lands is small in comparison with the area of the county. They are found principally near the streams, and average about 12 acres per square mile. The long droughts are the chief hinderance to successful farming operations. The cotton acreage is small, that crop as yet receiving but little attention.

San Antonio is the nearest railroad market, to which shipments are made by wagon.

ABSTRACTS FROM THE REPORTS OF F. W. KLEMCKE AND GEORGE W. MUDD, OF SOMERSET.

The uplands are rolling and level. The lands of the county are the fine or coarse sandy and the black shelly prairie. The *fine sandy lands* cover about two-thirds of the county area, and have a timbered growth of post, live and black-jack oaks, mesquite, hickory, cat-claw, and hackberry. The soil is a sandy loam, from 8 inches to 1 foot in depth, with a subsoil of red clay impervious to water, underlaid by sandstone at from 6 to 10 feet. It is easily cultivated, is early, warm, and well drained, and produces cotton, corn, and all varieties of vegetables. Cotton, constituting from two-fifths to two-thirds of the entire crops, grows to a height of from 3 to 4½ feet, the latter being the most productive. There is very little difference, either in the yield or in the rating of the staple, between cotton grown on fresh and that raised from long cultivated land, the product per acre being from 800 to 1,800 pounds of seed-cotton, from 1,425 to 1,665 pounds being required for 475 pounds of lint rating as strict middling. The rainfall has a great influence on the size and quality of the crop, and the plant runs to weed in wet seasons and when too closely planted. Deep plowing and topping has the effect of favoring bolling and restraining the tendency to run to weed. Crab-grass, lamb's-quarter, careless, nettle, and wild millet form the most troublesome weeds on all lands of the county.

Additional from the report of F. W. Klemcke.

Premature frosts do not kill the cotton crops either on the uplands or on the lowlands. Sometimes, though very seldom, when the cotton is planted before the 20th of April, the cool, damp weather causes "sore-shin". If properly cultivated the crop is always certain.

The belt of *coarse sandy* land is 8 miles wide and 30 miles long. The soil is about 4 feet in depth, gray in color, underlaid by clay, and has a natural growth of hickory and black-jack oak. It is easily cultivated in all seasons, and is early, warm, and well drained. It is best adapted to cotton, from which is obtained a very fine lint, rating as middling. The height usually attained by the plant is about 2 or 3 feet; the yield of seed-cotton per acre is from 600 to 1,000 pounds, and from 1,425 to 1,780 pounds are necessary for a 475-pound bale. There appears to be no difference in the above yield after the land has been cultivated many years. No land lies "turned out" in this county. Crab-grass is the only troublesome weed.

The *black prairie shelly* land has a natural growth of mesquite. The soil is a light gravelly loam, about 2 feet in depth; the subsoil is heavier, contains flinty pebbles and white gravel, and is underlaid with gravel and rock at from 7 to 10 feet. The land is early, warm, and in wet seasons ill-drained; also in such times it is difficult to till. It is best adapted to corn, cotton, and small grain. Up to this time (1880) only one-tenth of the cultivated area has been devoted to cotton, but the prospect is good for one-half. The plant usually attains a height of from 4 to 5 feet; but there is a tendency to run to weed in wet weather, for which deep plowing and topping are the remedies applied. In good seasons from 1,200 to 1,800 pounds is the product of seed-cotton per acre from fresh lands, and 1,600 pounds are requisite for 475 pounds of good middling lint. Long cultivation of the land does not seem to affect the above yield. Morning-glory vine, wild millet, and crab-grass are the most troublesome weeds. The soil does not wash or gully on slopes.

Shipments are made by wagon to San Antonio at 75 cents per bale, and thence to New York at \$7 50 per bale; also to Mexico.

FRIO.

Population: 2,130.—White, 2,065; colored, 65.

Area: 1,000 square miles.—Woodland, small part; oak, hickory, and pine region, 140 square miles; southern prairie, 860 square miles.

Tilled lands: 5,622 acres.—Area planted in cotton, 543 acres; in corn, 1,574 acres; in wheat, 8 acres.

Cotton production: 156 bales; average cotton product per acre, 0.29 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

Frio is one of the extreme western cotton counties of the state. Its surface is undulating or rolling, with some prominent points, and consists mostly of sandy prairies of the southwestern region, with a scattering growth of live and post oaks, pecan, and mesquite. The country is very sparsely populated, the ratio being only about two persons per square mile, and its prairies are chiefly devoted to stock-raising. The lands are not much under cultivation, because of the necessity for irrigation, caused by the extreme droughts. The county is watered by the Frio and Leona rivers, from which a supply can be obtained for irrigating purposes. These streams are timbered with elm, ash, willow, etc. San Antonio is the nearest railroad depot to which shipments of cotton are made. The lands under cultivation comprise less than 1 per cent. of the county area, and average 5.6 acres per square mile. This is one of the largest sheep-raising counties in the state, the number reaching 140,222 head.

ABSTRACT FROM THE REPORT OF LEWIS OWINGS, OF IRELAND.

This county has been only recently settled. The uplands are rolling and level table-lands.

The red sandy lands, covering about three-quarters of the county, with its growth of mesquite, live oak, ash, elm, willow, and hackberry, and the black sandy lands along the rivers and creek bottoms, comprise the lands devoted to the cultivation of cotton. The soil of the *red sandy lands*, which is the more important, is easily tilled, and has a depth of from 20 to 25 inches. It is early, warm, and well

drained, and produces corn, cotton, and potatoes. Fruit also does well, but it is best adapted to cotton, which grows to a height of from 3 to 5 feet, yielding 1,000 pounds of seed-cotton per acre, from 1,425 to 1,780 pounds of which are required for a 475-pound bale, the rating being good. The plant never runs to weed unless too thick in the drill, the remedy being thinning to a proper stand. Purslane and careless-weed are the most troublesome weeds. No land lies "turned out".

Shipments of cotton are made to San Antonio, as soon as ginned, by wagons, the rate being from \$2 50 to \$3 per bale.

MEDINA.

(See "Central black prairie region".)

UVALDE.

(See "Central black prairie region".)

GOLIAD.

Population: 5,832.—White, 4,166; colored, 1,666.

Area: 820 square miles.—Woodland, small part; oak, hickory, and pine region, 180 square miles; southern prairie, 640 square miles.

Tilled lands: 30,547 acres.—Area planted in cotton, 1,779 acres; in corn, 9,059 acres; in oats, 273 acres; in wheat, 372 acres.

Cotton production: 728 bales; average cotton product per acre, 0.41 bale, 615 pounds seed-cotton, or 205 pounds cotton lint.

Goliad is an undulating prairie county, watered by the Guadalupe river and Blanco creek, which form respectively the eastern and western boundaries, and by the San Antonio river, which flows in a southeast course through its center. These streams and their tributaries are timbered with pecan, oaks, cottonwood, and willow. Mesquite and chaparral bushes, with clumps or motts of live oak, are found abundantly on the prairies. The banks of the San Antonio river are high, and in them, as well as in those of the other smaller streams, there outcrops a whitish clay or adobe (Port Hudson), which was used as the building material in the old Mexican houses and missions. The walls of these buildings were made very thick, to withstand the washing effects of rains, which gives to them the appearance of simple mud houses. The soils of the county vary from dark sandy loam to black waxy calcareous clay on the prairies and gray sandy lands in the timbered uplands along the streams. Goliad is chiefly a stock-raising county. The cotton acreage is small, other crops being more productive and more profitable.

ABSTRACT FROM THE REPORT OF REV. J. E. VERNOR, OF WESATCHE.

The uplands consist of rolling prairie and timbered lands, mostly the former, with black waxy and white sandy soils.

The *black waxy lands* cover about one-fourth of the county, and the soil varies very much. On river bottoms, and also on the prairies, the waxy land is found, though the sandy lands are more plentiful, sometimes extending 25 miles. Scrubby post oak and mesquite, with pecan on the rivers, form the natural timber growth. The soil is a black, sticky, clay loam, very deep, very difficult to till in wet, but much easier in dry seasons, and is early, warm, and well drained. The subsoil is usually a kind of joint clay, which holds water well, but occasionally there is an adobe subsoil strongly impregnated with lime, containing sand or gravel, sometimes rock at from 3 to 30 feet, which produces cotton, corn, and oats. Cotton comprises about one-third of the crops, and grows to a height of from 3 to 5 feet, being most productive at 3 feet. It yields about 950 pounds of seed-cotton per acre, from 1,425 to 1,665 pounds being necessary for 475 pounds of lint. The above figures are not changed after the land has been in cultivation for twenty years. Cocklebur gives trouble to some extent, but crab-grass gives the greatest trouble to the planters on all lands of the county. Very little, if any, land lies "turned out".

The *black sandy land* comprises about five-eighths of the tillable area, and has a growth of post oak in places. The soil is fine sandy or gravelly, from brown to black in color, and from 8 to 30 inches in depth; it has a hard-jointed, impervious clay subsoil, underlaid by sand or gravel, and sometimes by rock. The land is easily cultivated, is early, warm, and well drained, and best adapted to cotton, to which about one-third of the land under cultivation is devoted, the height usually attained being from 3 to 5 feet, the former being the height at which it is the most productive. The yield is from 800 to 900 pounds of seed-cotton per acre, of which from 1,425 to 1,665 pounds are required for a 475-pound bale. Twenty years' cultivation has no effect either as regards the yield or rating of the staple.

The *white sandy lands*, comprising about one-eighth of the county, extend from 1 to 2 miles, and have a timber growth of post and black-jack oaks. The soil is white and coarse sandy, and has a depth of from 10 to 24 inches, with a subsoil of clay of good quality, such as is used for making brick and earthenware. It is early, warm, well drained, and apparently best adapted to cotton and sweet potatoes, the former, constituting about one-half of the entire crops, growing to a height of from 1 to 4 feet, being the most productive at 2 feet. The yield per acre in seed-cotton, both from fresh land and from land cultivated twenty years, is from 400 to 600 pounds, from 1,425 to 1,665 pounds being necessary for 475 pounds of lint. Drought and occasional wet seasons have a bad effect on the crops; drought prevents the appearance of the caterpillar, and wet seasons produce them.

Shipments are made from August to January, by the Morgan line of steamships, to New York at \$4 73, to New Orleans at \$3 53, and to Galveston at \$2 73 per bale.

OTHER COUNTIES PRODUCING LITTLE OR NO COTTON.

The counties comprising the rest of the southern prairie region to the Rio Grande river are extremely sparsely settled, and are chiefly devoted to stock-raising, very little cotton being grown. For character of land and general features the reader is referred to the regional description on page 32, and for statistical information to Tables I and II at the beginning of the report.

Calhoun and Aransas counties, immediately on the coast, report no cotton; Refugio, 15 bales; San Patricio, 2 bales, and also a little sea-island cotton; Nueces and Duval, none; Bee, 9 bales; Live Oak, 4 bales; Hidalgo, 9 bales; and Cameron, at the mouth of the Rio Grande, 23 bales.

CALHOUN.—This county is included between Matagorda and Lavaca bays on the east, and San Antonio bay and Guadalupe river on the west. The surface of the country is almost a perfectly level and open prairie, with here and there motts or clumps of live-oak trees. The lands are largely stiff black hog-wallow clays, with areas or belts of sandy prairie soils, underlaid by concretionary and gypseous clays and sandstones, as observed in the bluffs of Lavaca bay and Green lake.

ARANSAS.—One-third of the area is composed of bays, lagoons, and bayous. The surface is level, and is divided between open prairies and lands covered with live-oak and scrubby timber. The lands comprise the black waxy clays and sandy loams common to the southern prairie region, and are but slightly under cultivation. The crops are corn, potatoes, and vegetables. No cotton has been reported from this county, though the sea-island variety would no doubt do well.

Although no cotton has ever been planted in this county, because our greatest interest has always been that of stock, yet I am satisfied that the very best staple of sea-island cotton can be raised here, both on the main coast-line and on the adjacent islands that run parallel with the coast. Up to the past year no cotton had ever been tried within our extreme southwestern counties, with the exception of some in the Rio Grande valley. Last year experiments were made in some of our western counties, and with so much success that this year considerable quantities have been planted in Live Oak, Bee, Goliad, and San Patricio counties, and the prospect is at present so good that two cotton-gins are being built in these counties in the neighborhood of the planted cotton.—*E. A. Ferrenot, of Corpus Christi.*

REFUGIO.—This county is very similar to Calhoun in its surface features, being mostly a level and open prairie, intersected by skirts of timbered lands along the streams. The timber growth of the bottoms is white oak, pecan, elm, ash, hackberry, etc.; that of some of the uplands post, live, and black-jack oaks and mesquite. It is watered by many streams flowing into the numerous bays that border it on the south.

The lands of the prairies comprise the black waxy clays, dark and brown sandy loams peculiar to this southern region, with light sandy lands in the timbered sections. All are underlaid by heavy concretionary clays.

SAN PATRICIO.—This is a Gulf county lying between the Aransas and Nueces rivers, and its surface is mostly a prairie, with black calcareous and sandy-loam soils. Mesquite is the chief upland growth of the county, with clumps of live oak, while on the bottom lands there is found elm, ash, cottonwood, and hackberry.

There is a peculiar feature in this county called the "brasada", being an area of upland about 31 square miles, covered with a thick growth of mesquite, interspersed with chaparral and the prickly pear. The land is a rich, dark loam, and would undoubtedly produce well; but scarcely any of it is cultivated, owing to the labor of clearing and preparing the ground.—*Thwall, History of Texas.*

The uplands are level table-lands. The various lands of the county are sandy, occurring in patches on the slopes of hills, in Nueces valley, and on the Aransas river, black hog-wallow uplands comprising about five-eighths of the tillable area out from Nueces valley, along Nueces river, Corpus Christi bay, and Chiltipin creek, and black alluvial bottom on the Nueces river. Of the above the sandy land is the most important as regards the cultivation of cotton, which covers about one-fourth of the county. The timbered growth in the Nueces valley is wesatche and mesquite; on the Aransas river, live, post, and black-jack oaks; and live oak, cottonwood, ash, elm, hackberry, and willow along the Nueces river. The soil of the sandy lands, black in color, is very easily tilled in wet or dry seasons, producing cotton, corn, potatoes (Irish and sweet), sorghum, and all kinds of vegetables. The first forms about 20 per cent. of the crops, corn being the chief product. Wild mint, sunflower, and cocklebur are the troublesome weeds. Very little land lies "turned out". Shipments are made from Corpus Christi to Galveston.—*James O. Gaffney, of San Patricio.*

NUECES.—This county has a level or undulating surface, and consists mostly of prairies, either open or with a low growth of mesquite bushes and trees. Nueces river forms the northeast boundary, and a number of other streams flow through the county to the Laguna Madre. Corpus Christi, the county-seat, is located partly upon a bluff about 50 feet above the water-level, which is thought to be the highest along the entire Texas coast. The lands of the county are said to be a rich sandy loam, very productive in fair seasons. A small proportion of this land is under cultivation, the chief industry of the county being stock-raising. In the southern part of the county, and about 20 miles from Corpus Christi, are the sand hills of the desert, which extend thence to the valley of the Rio Grande.

DUVAL.—The following description is by W. H. Caldwell, of Borjas:

The country around Borjas, both east and west, is a hilly or rolling prairie. The hills are composed of white soft limestone, but underneath this, deeper in the earth, there is a formation of rock-like concrete, which is white and soft, but on exposure to the weather becomes quite hard. Only in rare cases do rocks outcrop in the creeks. The soil is sandy; the hills of red and the valleys or cañons of dark sand, underlaid by clay. The country is a broad prairie, the hills being covered with a black chaparral growth. The valleys are mostly open, and when not so mesquite brush and trees are found. There is no large timber on the prairies. The creeks are marked by motts of elm and hackberry trees of medium size.

BEE.—The surface of the county is rolling, with mostly open prairies, interspersed with areas of timbered lands and watered by numerous streams flowing southward. The timbered lands, it is estimated, cover about one-third of the county, with a scattering growth of post and live oaks, mesquite, etc., and lie mostly on the west of Beeville, the county-seat.

On the east and north there are broad and rolling prairies, well covered with grass, and devoted to grazing purposes. Their soils vary from sandy to black and waxy, and are underlaid by the heavy clays characteristic of this coast prairie region. The best lands are said to lie along the rivers.

LIVE OAK.—The surface of the county is partly undulating and partly level, and is divided by the Nueces river, which flows in an east and southeast course, with numerous tributaries on either side. Open prairies occupy about two-fifths of the county, the rest being covered by a growth of live-oak trees and mesquite on the uplands and elm, cottonwood, pecan, hackberry, etc., on the lowlands of the streams.

The soils vary from a light to a dark sandy loam, and are very productive in good seasons. Limestone occurs near Oakville, and sandstone in other parts of the county.

The uplands of this county are mostly rolling prairies. The soils of the county are dark sandy timbered lands, dark prairies, and light sandy soils, the most important one being the dark sandy loam, with its timbered growth of mesquite, live oak, hackberry, and mulberry. It is early, warm, and well drained, producing corn, oats, cotton, and sugar-cane. Until 1879 no cotton was raised in the county, but now in 1880 it is estimated that one-third of the crops is of cotton, experiment having proved that its cultivation would be attended with success.—*G. W. Jones, of Oakville.*

HIDALGO.—The lands of the river are very narrow, and approach near the stream at Hidalgo, the county-seat. Here, too, the first hills occur, in which sandstone is said to be the prevailing rock. The lands of this southern part of the county are the only ones under cultivation, and comprise soils varying from sandy to black and clayey. The timber growth is chiefly mesquite, ebony, wescatche, live oak, and Brazil wood on the upland or prairie valleys, and ash, elm, and hackberry on the bottoms. The chief crops are corn, potatoes, and vegetables; but very little cotton is planted. The rest of the county, especially on the north, is mostly sandy, with a scattering growth of moss-covered and scrubby live oak, and forms a part of the desert, which has here a width of about 25 miles. There are many salt lakes in this county, among which *Sal del Rey* is, perhaps, the most noted, being "a mile in diameter, in a flat, surrounded by higher land".

CAMERON.—The following description is from Rev. J. G. Hall, of Brownsville:

The country around Brownsville, and for 100 miles northward, is generally level, and the prevailing growth is mesquite and ebony, though there are many other scrubby varieties. The undergrowth in many places is very heavy. The soil is in belts of from 3 to 8 miles in width, and comprises black waxy and sandy varieties, the latter rather dark in color; but neither has a clay subsoil. The black waxy is the richest, though both are very productive in fair seasons.

For the first 60 or 70 miles above Brownsville the river valley loses itself in the plain, but farther up it becomes narrow, until at a little more than 100 miles it becomes almost nothing. The timber growth is heaviest along the river, though not very dense anywhere. Up to this time there has been very little cotton planted here, but the people are beginning to turn their attention more toward its culture. When there is rain it produces well.

Cotton in this locality often continues to grow for several years in succession unless killed by frosts. This method of culture is not only very uncertain of success, but the staple becomes very inferior. (a)

Mr. L. J. Hynes, living about 30 miles north of Brownsville, owns a large farm and has given much attention to the subject, and he thinks the want of proper labor is the only drawback to the successful culture of cotton. From his own crop, and what he bought from his neighbors, he shipped in one year about 300 bales, which rated as good middling in New York.

BRAZOS ALLUVIAL REGION.

(Comprises all or parts of the counties of Fort Bend, Wharton, Brazoria, and Matagorda.*)

FORT BEND.

Population: 9,380.—White, 1,871; colored, 7,509.

Area: 880 square miles.—Woodland, some; southern prairies, 760 square miles; Brazos alluvial, 120 square miles.

Tilled lands: 38,379 acres.—Area planted in cotton, 10,873 acres; in corn, 16,710 acres; in oats, 284 acres; in sugar-cane, 1,738 acres.

Cotton production: 6,431 bales; average cotton product per acre, 0.59 bale, 885 pounds seed-cotton, or 295 pounds cotton lint.

Fort Bend county is divided into two parts by the Brazos river, which has a very irregular southeasterly course through the county. San Bernard river and Oyster creek are independent streams on the west and east, though small in size until they approach nearly to the coast. The surface of the country is quite level, and the most important feature is the broad alluvial region or delta of the Brazos, which reaches from this county to the coast, and has been called "the sugar-bowl of Texas". It has a width of from 6 to 12 miles in this county, and includes the lands of Oyster creek on the east. Its timber growth is elm, ash, cottonwood, oaks, pecan, and hackberry, with areas of canebrakes, and wild peach undergrowth. The lands near the river are mostly reddish sandy loams, highly prized for their productiveness, and are largely under cultivation.

On the San Bernard river there is much cedar and cypress. The rest of the lands are black and clayey in character, have a prominent growth of elm, and are poorly drained and difficult to till. Sugar-cane is the chief crop on this bottom land, the production of sugar and molasses being very great, viz, 1,827 hogsheads of sugar and 119,079 gallons of molasses. The uplands of the county are level and open prairies, covering three-fourths of the area, with the exception of a narrow strip of post-oak lands on the northeast. The soils vary from stiff and black waxy clays to brown sandy loams, and are very generally devoted to grazing purposes. The heavy concretionary clays peculiar to the southern prairie region underlie them.

The lands under cultivation comprise but 6.8 per cent. of the county area, with an average of 43.6 acres per square mile. Of the latter but 12.4 acres are devoted to the culture of cotton, though the yield per acre is surpassed by only six counties in the state.

ABSTRACT FROM THE REPORTS OF THOMAS B. HOWARD AND W. E. KENDALL, OF HOUSTON.

The lands of the county comprise the first and second bottoms of Oyster creek, alluvial plain on or near the Brazos river, and level black and gray prairie uplands, partly hog-wallow in character.

The bottom lands of the Brazos river and immediate tributaries occupy about one-fifth of the county area, and embrace about four-fifths of the cultivated land of the county. The soil is a rich alluvium; chocolate color prevails, but varies to brown and black; depth to change of color, 3 feet. Down to 30 or 40 feet the material consists of strata of sandy and stiff brown loam from 3 to 5 feet thick, all being good

a Samples of cotton from stalks of four, three, and one year's growth, respectively, have been submitted for microscopical and expert examination, and the results show that the lint from the three-year-old stalk is much the shortest and weakest, though the widest of the three.

soil. Such is the bottom from within 8 miles of the Gulf of Mexico to 500 miles up on either side of the river. The natural growth is ash, elm, hackberry, pecan, cottonwood, sycamore, linden, yaupon, wild peach, cane, and a great variety of oaks. The Brazos bottoms comprise four classes, viz: (1) Canebrakes; (2) wild peach brakes; (3) pecan, oak, and ash growth; (4) elm flats. The canebrake variety is sandiest, chocolate-colored; the richest has produced two 500-pound bales per acre. When the soil is neither too wet nor dry it is easily tilled, and is early and warm, but ill drained. The soil is well adapted to cotton, corn, sugar-cane, sweet potatoes, red (anti-rust) oats, and millet, and these are the chief crops; but corn and cotton are chief among these. About one-half the cultivated area is planted in cotton. The plant grows to the height of 4 feet in dry seasons, 8 feet in wet, and 6 feet in good seasons. It inclines to run to weed when heavy showers are frequent late in June, July, and August, for which shallow cultivation with the sweep is the best remedy. Topping is frequently resorted to.

The seed-cotton product per acre of fresh land varies from 1,500 to 2,000 pounds, 1,545 pounds making a 475-pound bale of good lint. After thirty years' successive cotton production (without manure) the yield is the same; after forty years it is, in a favorable season, 1,700 pounds, ratio of seed to lint and quality as on fresh land. Corn yields have fallen off one-fourth in forty years. The troublesome weeds are cocklebur, careless-weed, morning-glory, and crab-grass. For several years after the war much of this land lay "turned out"; that amount is now one-twelfth, and is due to the scarcity of laborers, many of the negroes having gone to the towns.

Additional abstract by T. B. Howard.

The *brown, blackish and black, stiff prairie, partly hog-wallow* in character, comprises three-fifths of the county area. It extends from the Sabine river to the Rio Grande, and from 50 to 80 miles from the Gulf inland, and supports vast herds of cattle and horses. The soil is from 2 to 5 feet deep, the underlying material consisting of strata of clay, black and mulatto-colored, to a depth of 40 feet. Tillage is difficult when the soil is too wet or too dry; it must be broken early in spring. The soil is late, cold, ill-drained, and best adapted to cotton and grasses; but a small amount of it is planted in cotton. The plant grows from 3 to 5 feet high. The seed-cotton product per acre of the best is from 800 to 1,200 pounds in good seasons, 1,660 pounds making a 475-pound bale of lint, shorter than that of the bottom soil. The quantity and quality do not decline by cultivation (unmanured). The cocklebur and careless-weed are the most troublesome.

The condition of things relative to cotton production is gradually improving in Texas.

Cotton is shipped as soon as baled by wagon or rail to Houston, Galveston, or to any convenient town where there is a compress; rate per bale, \$1 50 per 100 miles.

WHARTON.

Population: 4,549.—White, 917; colored, 3,632.

Area: 1,170 square miles.—Woodland, one-fifth; one-fifth alluvial; four-fifths southern prairie region.

Tilled lands: 22,735 acres.—Area planted in cotton, 5,563 acres; in corn, 9,477 acres; in oats, 5 acres; in wheat, 5 acres; in sugar-cane, 92 acres.

Cotton production: 3,182 bales; average cotton product per acre, 0.57 bale, 855 pounds seed-cotton, or 285 pounds cotton lint.

The surface of Wharton county is quite level, with a gradual fall to the south, and is watered by many streams that find their way independently to the coast. The Colorado river divides it into two parts, its wide alluvial bottoms furnishing the best and richest lands of the county. These bottoms, as well as those of the San Bernard, are heavily timbered with cottonwood, ash, elm, cypress pecan, etc., and their soils are principally dark alluvial loams, that in fair seasons are capable of producing from 1,500 to 2,000 pounds of seed-cotton per acre. The other streams are bordered by skirts of timber, but otherwise the surface of the county consists of open prairies, well covered with grasses and devoted to grazing purposes. The soils of these prairies comprise the usual sandy and black waxy varieties, and are underlaid by calcareous concretionary clays. But 3.3 per cent. of the entire area of Wharton county is under cultivation, with an average of 21.2 acres per square mile. The crops comprise corn, cotton, sugar-cane, and vegetables, the former having the largest acreage. The average cotton product per acre of the county, including both bottoms and uplands, was in 1879 surpassed by only eight counties in the state. The acreage of that crop was, however, not quite one-fourth of the lands in cultivation.

Shipments are made by railroad to Galveston or Houston.

BRAZORIA.

Population: 9,774.—White, 2,250; colored, 7,524.

Area: 1,400 square miles.—Woodland, more than half; southern prairies, 640 square miles; Brazos alluvial, 760 square miles.

Tilled lands: 28,415 acres.—Area planted in cotton, 5,402 acres; in corn, 13,044 acres; in oats, 348 acres; in sugar cane, 3,358 acres.

Cotton production: 3,484 bales; average cotton product per acre, 0.64 bale, 960 pounds seed-cotton, or 320 pounds cotton lint.

Brazoria, one of the counties that border the Gulf, has a very level surface, and is about equally divided between prairie and timbered lands. Its most important feature is the Brazos river delta, a large body of land covering the western half of the county, and including the bottom lands also of Oyster creek and San Bernard river. In the immediate vicinity of the Brazos river and Oyster creek there are belts of red clayey alluvial lands, half a mile or more in width, which are above overflow, and comprise the best farming lands of the county. They have a timber growth of oaks, among which live oak is most prominent, elm, pecan, ash, etc., and an undergrowth of cane, and are very generally under cultivation, yielding in fair seasons, and in the absence of caterpillars, a bale or more of cotton per acre. Between these belts the country is swampy and poorly drained, and the lands consist of heavy, black clayey soils, with a predominant growth of ash and elm, interspersed with areas of black sandy or "wild peach land", so called because of the prominence of that growth. (See analyses of soils, page 45.)

On the east of Oyster creek there are broad and open prairies, covered with little else than grass, and devoted exclusively to grazing purposes. The lands that border the bottom region in a narrow belt are black, waxy clays, somewhat hog-wallow in character, but the greater part of the prairies are brown sandy loams, and all are underlaid

by the heavy concretionary clays peculiar to the southern prairie region. The lands under cultivation in Brazoria county are confined almost entirely to the better class that border the streams, and comprise about 3 per cent. of the county area, averaging but about 20 acres per square mile. Sugar-cane is the principal crop, and the county is foremost in the state in the amount of sugar and molasses produced, viz, 2,440 hogsheads of sugar and 175,530 gallons of molasses. For this reason the Brazos alluvial region has been aptly termed "the sugar-bowl of Texas". Cotton is the third crop in acreage in the county (3.9 acres per square mile), and its average yield is surpassed but by three counties in the state.

There is in this county quite a natural curiosity, known as Damon's mound, which is worthy of note. It is a round conical elevation about 200 feet above the surrounding level prairie. This mound covers an area of about half a mile in diameter, with a gradual and nearly uniform ascent on every side. It is some 20 miles from the nearest part of the Gulf, and is situated between the Brazos and Bernard rivers, 10 miles from the former and 4 from the latter, the whole country being nearly a level with this single exception. It is contiguous to the largest and finest body of timber in the country, consisting chiefly of cedar of superior quality. The mound is composed extensively of the finest limestone covered with earth. There is no other limestone or stone of any kind known to exist within 50 miles of the coast.—(M. S. Munson in the *Texas Almanac*.)

ABSTRACT FROM THE REPORT OF DAVID NATION, OF COLUMBIA.

The uplands of this county are devoted principally to grazing purposes. The varieties of soil may be classed as follows: The black and red sandy alluvial of the larger streams, covering about one-fifth of the surface of the county; the black waxy lands; and the black sandy.

The most important with reference to cotton is the *alluvial soil*, which has a natural timber growth of live, pin, and overcup oaks, elm, ash, hackberry, peach, and pecan. The depth of the soil before it changes color is 18 inches, but in reality it is between 30 and 40 feet deep. It is early, warm, well drained, easily cultivated, and produces cane, cotton, corn, and potatoes, being best adapted to the cane. About one-half the crops consists of cotton, which grows to a height of 5 feet in dry and from 5 to 10 feet in wet seasons, and there is a tendency of the plant to run to weed in wet seasons and when deprived of its fruit by the boll-worm. The yield per acre of seed-cotton is 2,000 pounds, and 1,900 pounds are required for 475 pounds of lint. Fifty years of cultivation does not seem to affect the above product. The troublesome weeds are hog and cocklebur, the former growing to a height of 25 feet. About one-half the land now lies "turned out", which, when again taken into cultivation, produces as well as new land.

The *black waxy lands* form a small proportion of the lands of the county, the natural timber growth being generally elm. The soil has a depth of 18 inches, with a subsoil similar to it, but not quite so stiff. It is very difficult of cultivation in wet seasons, is late, cold, and ill-drained, and seems best adapted to cotton, which constitutes 75 per cent. of the entire crops. The height usually attained by the plant is from 3 to 5 feet, being most productive at 4 feet. It yields 1,800 pounds of seed-cotton per acre, and 1,900 pounds are requisite for a 475-pound bale. No decrease is observed after fifty years' cultivation. Topping is employed to prevent running to weed. Coffee-weed and cocklebur are the most troublesome weeds on this land. About one-half the land lies "turned out", which produces as well as new land when again taken in.

The *black sandy peach soil*, covering about one-quarter of the county, with its natural growth of peach, pecan, hackberry, live oak, and mulberry, and interspersed with prairies, is a fine and black sandy loam about 18 inches deep. It is early, warm, well drained, and easily tilled, and is best adapted to cane. Cotton, forming one-half the entire crops, grows to a height of from 5 to 11 feet, and yields 3,000 pounds of seed-cotton per acre, 1,900 pounds being necessary for 475 pounds of lint. The above product is not changed after fifty years' cultivation. But very little land lies "turned out". Hog, Jerusalem oak, and cocklebur constitute the most troublesome weeds.

Shipments are made in October and November, by boat and rail, to Houston and Galveston at the rate of \$1 25 per bale.

MATAGORDA.

(See "Southern prairie region".)

CENTRAL BLACK PRAIRIE REGION.

(It comprises all or parts of the counties of Red River,* Lamar,* Fannin,* Grayson,* Cooke, Montague, Wise, Denton, Collin, Hunt, Delta, Hopkins,* Rains,* Van Zandt,* Kaufman, Rockwall, Dallas, Tarrant, Parker, Hood, Erath, Somervell, Johnson, Ellis, Navarro,* Hill, Bosque, Comanche,* Hamilton, Lampasas, Coryell, McLennan, Limestone,* Falls, Bell, Milam,* Williamson, Burnet,* Travis, Caldwell, Hayes, Blanco, Gillespie, Kerr, Kendall, Comal, Guadalupe, Bexar, Medina, Bandera, and Uvalde.)

RED RIVER.

(See "Red river alluvial region".)

LAMAR.

(See "Red river alluvial region".)

FANNIN.

(See "Red river alluvial region".)

GRAYSON.

(See "Red river alluvial region".)

COOKE.

Population : 20,391.—White, 19,560 ; colored, 831.

Area : 900 square miles.—Woodland, about one-third ; central black prairie region, 650 square miles ; lower cross timbers, 250 square miles.

Tilled lands : 98,160 acres.—Area planted in cotton, 27,795 acres ; in corn, 32,353 acres ; in oats, 4,388 acres ; in wheat, 7,960 acres.

Cotton production : 11,547 bales ; average cotton product per acre, 0.42 bale, 630 pounds seed-cotton, or 210 pounds cotton lint.

Cooke is one of the northern counties of the state, and, although bounded on the north by the Red river, has not been included in the group of Red river counties, because the bottom lands of that river have comparatively a small representation within its borders. These lands have a timber growth of walnut, pecan, ash, hackberry, elm, and cottonwood.

The surface of the country is for the most part a high and rolling prairie, with the usual black waxy or black sandy soils and rotten limestone (Cretaceous) of the central region. The eastern part of the county is occupied by the belt of lower cross timbers, which, with a width of about 10 miles, passes through it from north to south. Its growth is principally post and black-jack oaks and hickory ; its soil is gray and very sandy, with a yellowish subsoil, and its surface rolling and somewhat broken, with much ferruginous sandstone and gravel. Deep beds of white sand are often found on the edges and within the limits of this belt. The upland prairies extend north from Gainesville to the banks of the river, where the limestone forms abrupt bluffs 250 feet in height. The soil of this prairie is mostly a dark sandy loam. The lands under cultivation average 109 acres per square mile.

Corn is the chief crop of the county, cotton being next with its average of 30.9 acres per square mile. Stock-raising is a prominent industry of the county.

ABSTRACT FROM THE REPORT OF W. W. HOWETH, OF GAINESVILLE.

The bottom lands of the county are the richest, comprising the red sandy loams of Red river and the black sandy or waxy soils of Trinity river. The uplands are partly prairie and partly timbered, the latter being all sandy, and the prairies vary from sandy to black waxy in character. These lands are all more or less cultivated in cotton.

The *black and red sandy soils* cover about one-half of the county, embracing chiefly its eastern and northern portions. Its timber growth is post and black-jack oaks and hickory. The soils are mahogany and black coarse sandy loams 18 inches thick. The subsoils are a light grayish yellow, impervious clay, which, when exposed to the atmosphere, falls to pieces as lime does ; it contains fossil shells, and is underlaid by white limestone at from 8 to 10 feet. The soil is early, warm, well drained, easily cultivated, and apparently best adapted to cotton, to which one-third of its area is devoted. Cotton and corn are the chief crops of this region. The cotton-plant on this soil grows from 4 to 6 feet high, but is most productive at 4 feet. It inclines to run to weed in wet seasons, or when the boll-worm destroys its fruit. The seed-cotton product per acre, either from fresh land or from land fifteen years under cultivation, is 1,200 pounds, 1,665 pounds making a 475-pound bale of lint, which rates in the market as middling. The ratio of seed to lint and the quality of the staple are about the same, whether the land be fresh or old. The most troublesome weeds are cocklebur, sunflower, careless-weed, and crab-grass. None of this land lies "turned out".

The *black waxy prairie soil* covers about two-fifths of this region, and occurs in large bodies, extending from 5 to 10 miles in each direction. Its only natural growth is grass. The soil is a black loose loam from 12 to 18 inches and sometimes 4 and 5 feet deep to a change of color. The heavier subsoil is leachy, and is underlaid by white limestone at from 5 to 8 feet. The soil is easy to cultivate in dry weather ; if wet, it is adhesive and difficult to till, but it soon dries, and is not sticky. It is early, warm, well drained, and about equally well adapted to corn and cotton, one-half of its cultivated area being occupied by cotton. The usual height attained by the plant is 3½ feet, but it is most productive at 3 feet ; it inclines to run to weed in very wet weather, or when the boll-worm destroys its fruit. The seed-cotton product per acre is 1,000 pounds, 1,665 pounds making a 475-pound bale of lint, which rates as good middling. After fifteen years' cultivation the product ratio of seed to lint and quality of staple are the same as in the case of fresh land. The cocklebur, rag-weed, and Spanish nettle are the most troublesome weeds on this soil. None of this land lies "turned out".

Early cotton is sometimes injured by late frosts in the spring ; late cotton is injured sometimes by early frosts in autumn. Cotton on the lowlands is generally the best ; therefore the bottom or valley lands are preferred to uplands.

Cotton is shipped by rail in November and December from Gainesville to Saint Louis at \$4 50, or to Galveston at \$4 per bale.

MONTAGUE.

Population : 11,257.—White, 11,210 ; colored, 47.

Area : 890 square miles.—Woodland, greater part ; central black prairie, 140 square miles ; northwestern red loam, 40 square miles ; upper cross timbers, 710 square miles.

Tilled lands : 48,834 acres.—Area planted in cotton, 10,947 acres ; in corn, 15,571 acres ; in oats, 1,018 acres ; in wheat, 2,101 acres.

Cotton production : 4,172 bales ; average cotton product per acre, 0.38 bale, 570 pounds seed-cotton, or 190 pounds cotton lint.

Montague is the extreme northwestern county of the central prairie region, and has an average population of 12.6 persons per square mile. Its surface is hilly, with broad and open prairies on the east, diversified with narrow skirts of timber along the streams. The timbered area is very large, and comprises the belt of upper cross timbers which passes south from Red river into the counties on the south. The belt here is quite wide, and has the usual growth of post and black jack oaks and a deep sandy soil.

The extreme western part of the county is included in the northwestern prairie region, and is hilly, with some high peaks ; among them the Victoria peak is a prominent feature. The county is watered by the Red river and its small tributaries on the north and the headwaters of some of the tributaries of the Trinity on the south. Montague, the county-seat, is situated on the "divide" between these two rivers, which reaches from the southwest corner to the river on the northeast.

The lands of the eastern prairies are of the black waxy character of the central region, and where tillable are as productive as in other counties of the region. The land of the "timbers" is sandy, and in the lowlands very productive. Its upland growth is mostly scrubby post and black-jack oaks; in the bottoms cottonwood, pecan, ash, hackberry, etc. The lands under cultivation average 54.9 acres per square mile, and the crops comprise corn, cotton, oats, and potatoes. Corn has a larger acreage in this county than any other crop. The average of cotton is 12.3 acres per square mile. The open prairies are generally devoted to stock grazing.

WISE.

Population: 16,601.—White, 16,436; colored, 165.

Area: 900 square miles.—Woodland, about one-half; central black prairie, 500 square miles; upper cross timbers, 400 square miles.

Tilled lands: 84,081 acres.—Area planted in cotton, 21,352 acres; in corn, 27,400 acres; in oats, 2,267 acres; in wheat 4,121 acres.

Cotton production: 7,231 bales; average cotton product per acre, 0.34 bale, 510 pounds seed-cotton, or 170 pounds cotton lint.

The surface of Wise county is high and rolling, and the eastern portion is a broad prairie, known as the "grand prairie", having a black waxy soil, and interspersed with narrow skirts of timber along the streams, while the western portion is covered with the post-oak and black-jack growth of the "upper cross timbers". The county is watered by the west fork of the Trinity river and its numerous tributaries. These streams are said to have an immense fall, and their banks are high, rendering the bottom lands free from overflow. Their timber growth is walnut, pecan, ash, elm, etc. The upland timbered lands, comprising one-half of the area of the county, have a gray sandy soil, interspersed with small areas of a reddish sandy loam, and have a growth of post, Spanish, burr, and black-jack oaks. Lands under cultivation average 93.4 acres per square mile. In this county the acreage in corn is much greater than that of any other crop. The average in cotton is 23.7 acres per square mile.

ABSTRACT FROM THE REPORT OF J. M. HOLMES, OF DECATUR.

The county is about equally divided between prairie and timber. The eastern part is almost an entirely black waxy prairie. On the west are timbers, with small interspersed prairies. The bottom lands are subject to overflows, but if reclaimed are very rich. The various lands devoted to cotton culture are the gray and black sandy, the black waxy prairie, in some places hog-wallow, and the red or chocolate sandy.

The *dark gray sandy land*, comprising the timbered part, is the most important in reference to cotton. It covers about one-half of the county, and has a natural growth of post and black-jack oaks on the uplands, and post and Spanish oaks, elm, ash, pecan, hackberry, and walnut on the creeks and rivers. The soil is 2 feet in depth, with a red-clay subsoil, underlaid by rock at from 10 to 12 feet. It is easily tilled in wet seasons, and is early, warm, and well drained. The timbered portions are best adapted to corn and cotton, the latter forming one-third of the entire crops, while the prairie lands are most favorable to the production of wheat, oats, and barley. The height usually attained by cotton is about 4 feet, at which it is the most productive; but too much rain causes the plant to run to weed. From 1,200 to 1,500 pounds is the product per acre of seed-cotton. Sunflower, lamb's-quarter, bur, and careless are the most troublesome weeds in this and in the red lands. Considerable damage is done by the washing of the soil on slopes, the valleys being to some extent injured. Horizontalizing and hillside ditching, when well performed, check the damage.

The *black waxy prairie land* comprises about four-tenths of the tillable area. The soil is 2 feet deep; lower down it is of a lighter color, but grows darker by being exposed to the sun. Rock is found at from 2 to 10 feet. The soil is late, cold, and well drained, producing cotton and small grain, the former comprising one-third of the entire crop, and growing to a height of 3 feet. As in the last soil, too much rain inclines the plant to run to weed, which is obviated to some extent by topping. The yield of seed-cotton from land which has been under cultivation 15 years is, as on fresh land, from 800 to 1,000 pounds, 1,720 pounds being necessary for 475 pounds of lint, which rates as good middling. Sunflower and cocklebur are the troublesome weeds. No land lies "turned out". There is not so much washing of the soil in this case as in the last, no damage being done to the valleys. Good results have been attained by ditching.

The *red or chocolate land* constitutes about one-tenth of the agricultural district of the county, occurring in spots all over the timbered or sandy portion. Post, Spanish, burr, and black-jack oaks, and occasionally elm, form the natural timber growth. The soil is from 2 to 4 feet thick, the subsoil being similar but heavier, and is underlaid by sand at from 5 to 10 feet. It is early, warm, and well drained, and produces corn, wheat, oats, and cotton. The last comprises one-tenth of the entire crops, grows to a height of from 3 to 4 feet, and tends to run to weed in continued wet weather, topping being the remedy applied. From 1,000 to 1,500 pounds for fresh, and from 1,000 to 1,200 pounds for land cultivated for five years are the products per acre of seed-cotton, 1,720 pounds being in each case necessary for 475 pounds of lint, rating as good middling. The hilly land is considerably damaged by the soil washing, but the valleys do not suffer to any great extent. Efforts have been made to check the washing by means of horizontalizing and hillside ditching, with good results.

Shipments are made from 1st of November to the 25th of December by wagon to Fort Worth, thence to Galveston or New York by railroad, from \$4 50 to \$5 being the rate per bale.

DENTON.

Population: 18,143.—White, 17,071; colored, 1,072.

Area: 900 square miles.—Woodland, a little more than one-third; central black prairie region, 580 square miles; lower cross timbers, 320 square miles.

Tilled lands: 110,220 acres.—Area planted in cotton, 29,785 acres; in corn, 35,326 acres; in oats, 6,233 acres; in wheat, 12,103 acres.

Cotton production: 11,568 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

Denton is mostly a rolling prairie county, and is well watered by Clear creek and its tributaries, which flow southeast into the Trinity river. The lower cross timbers pass through it from north to south. This belt has a width of about 10 miles, and is covered by a growth of post and black-jack oaks, some underbrush, and has a deep sandy

and gravelly soil. Its surface is broken, and a considerable quantity of red and yellow ferruginous sandstone is found on the hills. The soil is said to be from 12 to 24 inches deep, with a somewhat clayey subsoil. On either side of this belt are prairie belts of black sandy soils, mixtures, as it were, of the sands of the timbers and the black waxy clays that form the lands of the rest of the prairies.

Rotten limestone (Cretaceous) is the prevailing rock of these prairies, and is found outcropping on the hills and sometimes in the banks of the creeks.

The county is sparsely settled, the average being about 20 persons per square mile. The prairies are mostly given up to stock grazing, for which the great abundance of grass is admirably suited. Corn, cotton, and wheat are the chief crops in the order in which they are named. The lands under cultivation comprise 19.1 per cent. of the county area, averaging 122.5 acres per square mile. The cotton acreage is about 33.1 acres per square mile.

ABSTRACT FROM THE REPORT OF J. W. EVANS, OF PILOT POINT.

The lands of this county are black waxy prairie and light and black sandy timbered lands. Only the sandy lands will be described. These *sandy timbered lands* extend 8 miles west, 20 miles north, and 10 miles south. The soil varies from a fine sandy to a coarse sandy and gravelly loam, is 18 inches deep, and bears a natural timber growth of post and black-jack oaks. The subsoil is heavier, and is hard-pan in some small spots and leachy in others. It contains soft "black gravel" and dark-brown pebbles, and is underlaid by gravel and sand-rock from 10 to 30 feet. The soil is early, warm, and well drained, and tillage is easy under all circumstances. It is apparently best adapted to cotton, the chief export crop; corn and potatoes are also raised, but chiefly for local consumption.

Cotton comprises about three-fifths of all crops on this land. The plant attains heights varying from 5 to 10 feet, but is most productive at 5 feet. It runs to weed in wet seasons or on manured land, and topping and throwing dirt from the row are practiced as remedies to restrain it and favor bolling. The seed-cotton product per acre varies on fresh land from 800 to 1,200 pounds, and from 1,600 to 1,665 pounds make a 475-pound bale, the lint rating in the market as middling. Two years' cultivation increases the seed-cotton product from 1,500 to 1,800 pounds; the seed is then heavier (it does not mature on fresh land), but the staple is better. The most troublesome weeds are crab-grass, horse, smart, careless, sunflower, and cocklebur. No cultivated land has yet been "turned out", but large bodies of land are yet lying out which have never been cultivated.

Shipments are made by wagon to Sherman at \$1 per bale.

COLLIN.

Population: 25,983.—White, 24,003; colored, 1,980.

Area: 880 square miles.—Woodland, very little; all central black prairie region.

Tilled lands: 170,577 acres.—Area planted in cotton, 48,236 acres; in corn, 52,255 acres; in oats, 10,834 acres; in wheat, 24,242 acres.

Cotton production: 22,145 bales; average cotton product per acre, 0.46 bale, 690 pounds seed-cotton, or 230 pounds cotton lint.

Collin is chiefly a high and rolling prairie county, with belts of timbered lands along the streams and on some of the uplands, and is watered by the east fork of the Trinity river and its tributaries, flowing southward. The bottom lands of these streams have a dark, silty alluvial soil, and a timber growth of black walnut, pecan, oak, elm, honey-locust, bois d'arc, and hackberry. The river lands are wide in places, but are not much under cultivation. The prairies have a black waxy and often a hog-wallow soil, and a stiffer yellowish clay subsoil. On some of the hills the soils are thin, and the rotten limestone (Cretaceous) that underlies the entire county comes frequently to the surface, but in the valleys and on the broad table-lands the soils are deep and present excellent agricultural features. (See analysis of soil, page 36.)

Collin is chiefly an agricultural county, 30.3 per cent. of its area being under tillage, with an average of 193.8 acres per square mile. It is the chief corn and oats county of the state, the former being its chief crop, while in the production of wheat it ranks as third.

As a cotton county it stands fourth in the state in total production. Its acreage per square mile is 54.8, the highest but five in the list of counties.

ABSTRACTS FROM THE REPORTS OF W. G. MATTHEWS, OF PLANO, AND A. G. GRAVES, JR., AND GILES G. HOUSTON, OF M'KINNEY.

The relative amount of river and creek bottom land is small in this county, and of this only a small part is in cultivation. Seven-eighths of the soil of the county is what is commonly designated the "*black waxy soil*" of northern Texas. It extends (from Plano) 15 miles west, 40 northwest and north, 50 northeast and east, and 65 miles southeast, south, and southwest. This land is nearly all prairie, timber, occurring chiefly along the water-courses. Where occurring on the highlands the growth is scrubby, and consists of oaks, elms, bois d'arc, ash, pecan, hackberry, honey-locust, and black walnut. The soil has a depth varying from 1 to 6 feet; its color is black, except that on points where the surface has been washed off it is reddish brown. When dry, it is light and mellow; when wet, it is heavy and putty-like, or waxy. It is calcareous, and the greater part is underlaid by a stratum of soft, white limestone or marl. Tillage is easy in dry, but difficult in wet seasons, and is easier on high than on low, hog-wallow places. The soil is early, warm, naturally well drained, and is best adapted to corn, wheat, cotton, oats, and sorghum. Millet, barley, sweet potatoes, the earlier Irish potatoes, and other root crops are raised, but the yields are smaller than they are on sandier lands.

About one-half of the cultivated land is planted in cotton. The plant usually attains a height of from 2 to 3½ feet on higher and from 3 to 5 feet on lower lands, 4 feet being considered the most productive height. It is inclined to run to weed only in very wet seasons, and topping the plant is the most successful remedy. The average seed-cotton product per acre of land, fresh or old, is about 1,000 pounds, from 1,425 to 1,545 pounds making a 475-pound bale of lint, which rates high in the market. In the amount or quality of cotton produced old land does not appreciably differ from fresh land. The chiefly troublesome weeds are Spanish nettles, buffalo-burs, cockleburs, crab-grass, smart-weed, purslane, sunflower, careless-weed, and morning-glory.

The soil of the county is very uniform in character, consisting of rolling and black waxy prairies. There are many spots of hog-wallow, which disappear and cultivate kindly on slopes, but remain tough when the general surface is flat. The climate is very favorable to cotton growing, the only hindering circumstances being late and early frosts, heavy rains in connection with cold north winds, and

droughts. The low "hog-wallow" land is most liable to frosts, and it often happens in the same field, the parts of which vary not more than 12 feet in elevation, that the cotton only in the lower parts will be injured by frost. The heavy rains injure the crop in its early stages; and the drought occurs when the bolls are forming, and the shedding of bolls is a consequence. But these things do not generally result in serious damage to the cotton crop. This region has, so far, been comparatively free from insect pests.

Shipments are made as soon as cotton is ginned, by railroad, to Galveston, New Orleans, or Saint Louis, prices ranging from \$4 50 to \$5 per bale.

HUNT.

Population: 17,230.—White, 16,015; colored, 1,215.

Area: 870 square miles.—Woodland, very little; all central black prairie region.

Tilled lands: 111,797 acres.—Area planted in cotton, 25,906 acres; in corn, 29,157 acres; in oats, 6,314 acres; in wheat, 7,385 acres.

Cotton production: 10,805 bales; average cotton product per acre, 0.42 bale, 630 pounds seed-cotton, or 210 pounds cotton lint.

Hunt is one of the border counties of the central prairie region, and its surface is undulating and diversified with prairies and belts of timbered lands, the former occurring mostly on the northwest. The county is well watered by numerous small streams. Those on the northwest are tributaries of the Trinity river; those on the northeast and south flow into the Sulphur fork and Sabine, respectively.

The prairies have the black clayey lands and underlying rotten limestone peculiar to the central prairie region. They are not as rolling and broken as those in the counties farther west, and all of the lands may be considered as tillable. Some of the prairies on the east have sandy soils. The sandy timbered lands, comprising one-third of the county, extend sometimes 10 miles in each direction, and have a growth of post oak, black-jack, and black oak. Cultivated lands comprise 20.1 per cent. of the county area, with an average of 128.5 acres per square mile.

Corn is the chief crop of the county, its acreage being larger than that of any other. Cotton ranks next, with an average of 29.8 acres per square mile.

ABSTRACT FROM THE REPORT OF WILLIAM R. HOWARD, M. D., OF WHITE ROCK.

The uplands of the county are rolling, and comprise partly black sandy prairies, partly black hog-wallow, waxy prairies, and partly timbered lands.

Of the three kinds of soils cultivated in cotton, that of the *black waxy, hog-wallow prairies* is the chief, occurring in bodies of 300 acres each, some of it having a natural timber growth of elm, bois d'arc, honey-locust, hackberry, swamp dogwood, red-bud, rattan vines, and briars. The soil has an average depth of 3 feet, and covers one-third of this region. The subsoil is heavier, grayish in color, sometimes bluish, and is impervious to water when undisturbed. It contains in many places an abundance of fossil marine univalve shells from 3 to 6 inches in diameter, underlaid at from 5 to 10 feet by soft, white limestone, and in places by a so-called "black slate", which emits the odor of petroleum. Tillage of this soil is rather difficult in wet, but easy in dry seasons; and no matter how hard and cloddy the soil is when broken up, the clods are disintegrated or rather soaked by the first rain. The soil is early and warm, has generally good natural drainage, and is apparently best adapted to cotton, one-half the cultivated land being devoted to its production. The other chief crops of this region in the order of their acreage are corn, oats, and wheat. The cotton-plant attains a height of from 2 to 4 feet on this soil, but is most productive at 2½ or 3 feet. It is inclined to run to weed when it follows corn on fresh land, or when such land is deeply plowed. Among several methods to prevent this and favor bolling shallow plowing or bedding on the hard ground has been tried with favorable results. The seed-cotton product per acre of fresh land is from 1,000 to 1,600 pounds, 1,425 pounds (including toll for ginning) being the minimum amount required to make a 475-pound bale of lint. The product of old land is about the same in amount as that of fresh. The plant grows less to weed, but yields more bolls. A little less seed-cotton is needed to make a bale of lint, and the staple is nearly equal to that from fresh land. The staple is especially fine when the crop has been preceded by a crop of small grain. None of this land has yet been impoverished by successive cultivation. The soil on slopes does not wash or gully badly, nor does any damage result from such cause. Cocklebur, crab-grass, pig- (*C. album*), rag-, and careless-weeds are the most troublesome on this soil.

The *sandy land* comprises one-third of the county. It is a fine sandy and gravelly loam, its color gray blackish, but chiefly black, and its depth varies from 3 to 30 inches. The prairie portion of it bears a natural growth of grass. This soil varies in fertility through nearly all degrees. The heavier and leachy subsoil contains hard "black gravel" and rounded pebbles generally, but in places it is wholly free from them, and is underlaid by sand, gravel, and white and soft limestone at from 20 to 30 feet. Tillage is always easy, and the soil is early, warm, and well drained, and apparently best adapted to cotton. Of the cereals oats mature best, and corn does well on parts of it in wet seasons. Cotton occupies one-half the cultivated part of this soil, the usual and most productive height attained by the plant being 3 feet. Deep plowing and fresh land incline the plant to run to weed, shallow cultivation and topping obviating the tendency. The seed-cotton product per acre of fresh land is from 1,000 to 1,300 pounds, from 1,425 to 1,545 pounds making a 475-pound bale of lint, which rates as middling. After ten years' cultivation the product per acre varies from 700 to 1,300 pounds (the soil itself in different places being variable to this extent), and 1,425 pounds are then needed for a 475-pound bale of lint, which compares favorably with that from fresh land. Crab-grass and pig- and careless-weeds are the most troublesome. About 3 per cent. of this land originally cultivated now lies "turned out"; it improves by rest. Slopes are seriously damaged by washing and gullying of the soil, but the washings do not injure the valleys.

A mixed land, or *sumac and collard land*, covers one-third of the region, and is formed by the mixture of the soils just described. The soil has a blackish color, which extends 24 or 30 inches below the surface, and is composed of coarse sand and clay. A part is prairie, and bears sumac and collard, and the rest is timbered with post oak, water oak, cottonwood, and wild plum, and has also thickets of thorny underbrush. The subsoil is lighter than the surface soil, but is impervious; it is underlaid by sand, gravel, and white rock at from 3 to 30 feet. Tillage is easy at any season, and the soil is early, warm, well drained, and apparently best adapted to cereals and cotton. Cotton occupies one-half its cultivated area, the usual and most productive height attained by the plant being 3 feet. The seed-cotton product per acre of fresh land is from 1,000 to 1,800 pounds, and 1,545 pounds are needed for a 475-pound bale of lint, which rates in the market as good middling. Where rotation of crops is reasonably practiced there is little or no diminution in the product of seed-cotton per acre, even after twenty years' cultivation. From 1,425 to 1,545 pounds of seed-cotton from old land are required to make a 475-pound bale of lint, which compares favorably with that from fresh land. The most troublesome weeds are crab-grass, cockleburs, pig-weed, and three

varieties of careless-weeds, the thorny variety being the most formidable. None of this land has yet been "turned out", on account of decline in productiveness. The soil on the slopes is liable to wash or gully, and if not prevented serious damage to the slopes results in this way; but the washings do not injure the lower lands.

On the lowlands cotton starts later, grows more to weed, and is liable to be frost-killed in the fall. Nearly all the uplands produce cotton well. Wind-storms sometimes damage the crop on the higher prairies, often blowing out the staple as fast as the bolls are opened.

Cotton is shipped as soon as baled, by railroad, to Sherman or Terrell at the rate of \$2 50 per bale.

DELTA.

Population: 5,597.—White, 4,999; colored, 598.

Area: 260 square miles.—Woodland, small part; oak, hickory, and pine region, 20 square miles; central black prairie region, 240 square miles.

Tilled lands: 29,389 acres.—Area planted in cotton, 8,940 acres; in corn, 9,199 acres; in oats, 1,902 acres; in wheat, 1,409 acres.

Cotton production: 4,911 bales; average cotton product per acre, 0.55 bale, 825 pounds seed-cotton, or 275 pounds cotton lint.

Delta is a small triangular-shaped county on the eastern edge of the central prairie region, and is partly included in the oak and hickory uplands. It lies between the forks of the Sulphur river. The prairies of the western part of the county are quite level or undulating, with black waxy or black sandy lands, and are diversified with timbered areas along the streams. It is underlaid by the white rotten limestone of the Cretaceous. The prairie lands are very productive, yielding in ordinary seasons from 800 to 1,000 pounds of seed-cotton per acre. The eastern part of the county has a timber growth of post oak, hickory, etc., and a sandy soil with a subsoil of yellowish clay, more or less sandy. These lands also produce well, and seem to be preferred to the black prairies, as being more easily tilled and as productive.

Corn, cotton, oats, and wheat are the chief crops, and are named in the order of their predominance. Lands under cultivation average 113 acres per square mile. The acreage devoted to cotton is an average of 34.4 acres per square mile. The average yield per acre for 1879 was about 825 pounds of seed-cotton, the county ranking as eleventh in the state in this regard.

HOPKINS.

(See "Oak, hickory, and pine region".)

RAINS.

(See "Oak, hickory, and pine region".)

VAN ZANDT.

(See "Oak, hickory, and pine region".)

KAUFMAN.

Population: 15,448.—White, 13,471; colored, 1,977.

Area: 830 square miles.—Woodland, small part; oak, hickory, and pine region, 90 square miles; central black prairie region, 720 square miles; brown-loam prairie region, 20 square miles.

Tilled lands: 84,317 acres.—Area planted in cotton, 26,659 acres; in corn, 24,386 acres; in oats, 4,522 acres; in wheat, 8,921 acres.

Cotton production: 10,668 bales; average cotton product per acre, 0.40 bale, 600 pounds seed-cotton, or 200 pounds cotton lint.

The surface of Kaufman county is rolling, and is watered by the tributaries of Trinity river, flowing in a southerly course. The southeastern part of the county is covered with the gray sandy soil of the post-oak uplands region of eastern Texas, and has its characteristic timber growth. The rest of the county is an open prairie, except along the water-courses, where there is a growth of elm, bois d'arc, etc. The soil of the prairies is usually black and waxy, except near the timbers, where it becomes more sandy. It is several feet in depth, and is underlaid by the limestone of the Cretaceous. On the west this rock is soft, or of the "rotten" variety, but at Terrell it is overlaid by the hard fossiliferous variety that forms the uppermost stratum in this part of the state.

This county does not form an exception to others of the state in being sparsely settled, the proportion of population being about 18.6 per square mile. Lands under cultivation average 101.6 acres per square mile. Cotton is the chief crop, its acreage being an average of 32.1 per square mile.

The average yield of seed-cotton for 1879 was not large, probably because of the drought of that year, which was felt all over the state.

ABSTRACT FROM THE REPORT OF H. B. M^CCORKLE, OF ELMO.

The surface of the county is equally divided between timber and prairie lands. The bottom lands, having a black alluvial, shelly soil, are well timbered, and are better adapted to cotton, corn, sweet potatoes, and vegetables than to small grain, being preferred on account of drought. The uplands comprise black sandy and black waxy land and gray sandy land. That best adapted to cotton is the *black sandy and black waxy upland*, which abounds on all the creeks, and covers nine-tenths of the county. In some localities there is a growth of post, black, black-jack, and red oaks, hickory, elm, and an undergrowth of dogwood, sassafras, grape-vine, and mulberry. The soil is 2 feet deep, is early, warm, and well drained, and easily tillable. The subsoil is a yellow or reddish clay, containing, sometimes, large pebbles, and is underlaid by soft limestone at from 4 to 20 feet. All kinds of grain grow well, although the soil is best adapted to cotton and corn.

Two-thirds of the acreage is devoted to cotton, which usually reaches on black sandy lands a height of 4 feet, and on black waxy soil 3½ feet. If the season is such that moisture is kept within 4 inches of the surface, the cotton has a tendency to run to weed, which is remedied by the use of the scoter-plow close to the plant and by topping. Fourteen hundred pounds is the yield per acre of seed-cotton for fresh lands. For lands which have been in cultivation 4 years, 1,000 pounds for upland and 1,500 pounds for bottom land is the product per acre of seed-cotton; 1,685 pounds is, in both cases, the amount necessary to pay toll (one-twelfth) and make 475 pounds of lint. Cotton produced from the fresh land commands a higher price than that from land which has been under cultivation. The most troublesome weeds in this region are careless, hog, Jamestown, and cocklebur. On the gray sandy lands the trouble arises from crabgrass. No land lies turned out.

As soon as the cotton is baled it is shipped by railroad to Saint Louis, Galveston, and New Orleans, the rate being \$4 25 per bale.

ROCKWALL.

Population: 2,984.—White, 2,898; colored, 86.

Area: 150 square miles.—Woodland, very little; all central black prairie region.

Tilled lands: 26,443 acres.—Area planted in cotton, 5,786 acres; in corn, 6,715 acres; in oats, 961 acres; in wheat, 2,515 acres.

Cotton production: 2,630 bales; average cotton product per acre, 0.45 bale, 675 pounds seed-cotton, or 225 pounds cotton lint.

Rockwall is the smallest county in the state. Its surface is principally a gently undulating prairie, whose soil is of the black waxy nature common to the central prairie region, and produces from 800 to 1,000 pounds of seed-cotton per acre. The streams of the county are very small, and are usually timbered with a growth of elm, pecan, etc., but the lands are not much under cultivation. More than one-fourth of the county area is under tillage, averaging 176.3 acres per square mile. Corn has a larger acreage than any other crop of the county, cotton ranking next, with its average of 38.6 acres per square mile. The yield per acre is high in comparison with the general average of the state.

ABSTRACT FROM THE REPORT OF WILLIAM H. PRICE, OF ROCKWALL.

Only a very small portion of the land of this county is lowland; such, though exceedingly rich, is mostly in timber, but may in time be brought into cultivation. Drought is the greatest difficulty to be encountered in the cultivation of cotton. The lands devoted to cotton comprise the black waxy prairie, known as hog-wallow and smooth land, there being but little difference in quality, and the sandy (both light sandy and rawhide, or tough) land. *Black waxy prairie land* is the most important, covering about nine-tenths of the county, and has a growth of bois d'arc, live oak in spots, elm, ash, and pecan in bottoms. The soil is from 3 to 8 feet in depth, early, warm, and well drained, and produces wheat, oats, corn, and cotton. It is best adapted to wheat and cotton, the latter, constituting about one-third of the crops, growing to a height of 4 feet, and tending to run to weed in seasons which are warm and moderately moist, and when well tilled. Land fifteen years under cultivation produces more than fresh lands, the yield from the former being about 1,000 pounds of seed-cotton per acre, 1,545 pounds being necessary for 475 pounds of lint. Buffalo-bur (this is a monster), sunflower, and a variety of the careless form the most troublesome weeds. No land lies "turned out". Cotton needs much less rain than any other crop; wheat is matured before the drought sets in.

Shipments are made, in September, October, and November, by railroad, to Terrell and to Galveston at the rate of \$4 50 per bale.

DALLAS.

Population: 33,488.—White, 28,530; colored, 4,958.

Area: 900 square miles.—Woodland, small part; central black prairie region, 770 square miles; lower cross timber, 130 square miles.

Tilled lands: 190,542 acres.—Area planted in cotton, 44,377 acres; in corn, 44,004 acres; in oats, 8,306 acres; in wheat, 26,854 acres.

Cotton production: 21,469 bales; average cotton product per acre, 0.52 bale, 780 pounds seed-cotton, or 260 pounds cotton lint.

Dallas is a high and rolling prairie county, with skirts of timbered lands lying along the streams, and it is well watered by the Trinity river (flowing in a rather diagonal course through its center southeastwardly) and its many tributaries. The bottom lands of the streams, and especially of the river, have a dark and deep silty alluvial soil, underlaid by a stiff clay, and are capable of producing in ordinary seasons as much as 1,000 pounds of seed-cotton per acre.

The timber growth consists of cottonwood, pecan, ash, elm, etc. Between the river bottom and the prairie uplands there is a broad open prairie valley several miles in width, bounded by high bluffs or ridges of the white Cretaceous limestones. The soil at the foot of the ridges is usually black and waxy, but becomes more and more sandy toward the river, and finally, in the edge of the timbered bottoms, there are sometimes found deep beds of white sand. This Trinity valley "lies beautifully", has a very gentle undulating surface, and is apparently easily tilled. From Dallas it extends westward into Tarrant county, following the course of the river. A mesquite growth occurs in localities. (See analysis of soil, page 44.)

The prairie uplands are high and rolling, interspersed with strips of timbered lands, and have a black waxy, or, in places, a black sandy soil, in which the rotten limestone is often found outcropping.

The city of Dallas has an elevation of 468 feet above the sea. There are two cotton compresses and a cottonseed-oil mill located here.

Dallas is an agricultural county, 33.1 per cent. of its area being under tillage, or an average of 211.7 acres per square mile. It is also the principal wheat county in the state, the acreage of that crop being greater than in any other county. Cotton and corn are, however, the chief crops, their acreages being very nearly the same. In total production the county ranks fifth, and in product per acre fourteenth in the state. Its acreage per square mile is 49.3 acres.

ABSTRACT FROM REPORTS OF W. W. ROSS AND JOHN H. COLE, OF DALLAS.

The lands upon which cotton is cultivated are the black prairie, commonly known as the black waxy or hog-wallow, the black sandy prairie, and the light or white sandy. The black waxy constitutes the chief soil, covering about eight-tenths of the county, and extending north to Red river 80 miles, south 75 miles, east from 40 to 60 miles, and west from 70 to 100 miles.

The *black prairie land* has no timber. The soil is a black clay loam from 1 to 8 feet in depth, very difficult to till in wet weather, but quite the reverse in dry seasons. It is an early, warm, well-drained soil, and seems to be best adapted to corn. The subsoil is similar to the soil, but is a little heavier, and is underlaid by soft limestone, which is impervious to water, causing in very wet seasons what we call "poison earth", the result of which is that vegetation, especially that having tap-roots, dies. The cause of this has never been understood.

The crops of the county, with their average yield per acre, are: corn, from 40 to 60 bushels; wheat, from 15 to 20 bushels; cotton, 1,200 pounds of seed-cotton; oats, from 40 to 70 bushels; rye, from 20 to 30 bushels; Irish potatoes, from 60 to 80 bushels; and sweet potatoes, from 100 to 150 bushels. Cotton forms three-tenths of the total crops planted, attaining a height of from 3½ to 6 feet; at the former height it is most productive. It runs to weed in very wet seasons, and also when the boll-worm causes shedding, but otherwise it fruits very heavily. Topping is the method used by some planters to restrain the running to weed and to favor bolling, and the result is beneficial where the cotton-plants are not too thick. The staple rates the same on old and new land. The older the land the better it is, none being "turned out". Horse-weed, nettle, cocklebur, hog-, and careless-weed are apparently the weeds which are the greatest source of trouble to planters. Crab-grass troubles them but little.

About one-tenth of the tillable lands of the county consist of *black sandy prairie*, having in places a brushy growth of swamp dog-wood, haw, wild china, and hackberry. The soil resembles fine rifle powder, being a fine sandy loam from 1 foot to 2 feet in depth; it has a subsoil composed of a very compact red, or in some cases blue clay, containing black, ferruginous pebbles, and is underlaid by gravel and white limestone at from 2 to 3 feet. The land can be easily tilled in either wet or dry seasons, as it never becomes hard, is early, warm, and usually well drained, and is best adapted to cotton and corn. One-third of the land is devoted to cotton, which grows to the height of from 4 to 5 feet, the former being the most productive. Excessive rains are the cause of the plant's running to weed, which is in some degree restrained, when the plant is not too thick, by topping. The yield of cotton is the same as on the last soil. The careless-weed is the most troublesome on this soil.

The *light or white sandy bottom lands* constitute one-tenth of the tillable lands, and have a natural growth of post, black-jack, and red oaks, hickory, red elm, and grape-vines. The soil is from 1 to 2 feet deep, and is underlaid by a red clay hard-pan, mixed with sand to a certain extent, and containing ferruginous pebbles. The soil, which is best adapted to cotton and corn, is early, warm, and well drained, and very easily tillable in either wet or dry seasons. Cotton comprises about one-third of the crops, and the growth is from 5 to 6 feet, 5 feet being the most productive. On fresh land from 1,200 to 1,500 pounds of seed-cotton are raised per acre; from 800 to 1,000 pounds is the yield on land which has been under cultivation for ten years, in which case 1,545 pounds are needed for a 475-pound bale, whereas on fresh land 1,425 pounds is the necessary amount. There is no difference in the rating of the staple from the two soils. The boll-worm and too much rain, in this case as in the others, cause the plant to run to weed, the same remedy being applied. About one-twentieth of the land is "turned out", and, after resting for five or six years produces, when again cultivated, about one-third less than it did originally. Careless- and hog-weeds are troublesome, but crab-grass is extremely so.

Black waxy bottom land is not much planted in cotton, being cold and late and subject to frost in spring. A large proportion of our land lies high and dry and in large bodies, and our planters much prefer it for cotton. Frost affects the plants 8 or 10 days later than on the bottom land.

Shipments are made, when the prices are good, usually to Saint Louis by railroad; to eastern mills at \$7 50 or to Liverpool at \$9 75 per bale, or to Galveston.

TARRANT.

Population: 24,671.—White, 22,488; colored, 2,183.

Area: 900 square miles.—Woodland, about one-third; central black prairie region, 610 square miles; lower cross timbers, 290 square miles.

Tilled lands: 143,440 acres.—Area planted in cotton, 27,821 acres; in corn, 38,496 acres; in oats, 7,055 acres; in wheat, 26,481 acres.

Cotton production: 10,950 bales; average cotton product per acre, 0.39 bale, 585 pounds seed-cotton, or 195 pounds cotton lint.

The surface of Tarrant county is high and rolling, and is well watered by the Trinity river and its tributaries. The belt of lower cross timbers passes through it from north to south east of Fort Worth, the county-seat. This belt is about 10 miles wide, and has a deep sandy soil over a clayey subsoil, associated with beds of brownish ferruginous gravel. (See analysis, page 29.) In the central part of the belt there are low hills of sandstone and conglomerate. Near Handley, a station near the western edge, these timbers are seen to be underlaid by the limestone of the prairies, and quantities of the Cretaceous fossil *gryphaea* are found in the beds of the small streams. The lowlands of these streams have a rich brown-loam soil, very productive, and in places rather extensive; the uplands, on the contrary, are not very fertile, except where the subsoil comes near to the surface. The river bottom lands are rich and productive and well timbered, but seem to be but little under cultivation. The prairie valleys lying between them and the high uplands are broad, and have a black clayey soil, with some mesquite growth.

The rest of the county is a high and rolling prairie, with black waxy lands, deep in the valleys but thin on the hills, the underlying rotten limestone coming very generally to the surface and outcropping on the sides in ledges. Near the timbers the usual black sandy soils occur.

About one-fourth of the county area is under cultivation. Tarrant ranks next to Dallas, or second in the state, in the acreage given to wheat, and first in the state in the number of bushels produced. Corn is, however, its chief crop. Cotton has an acreage but little larger than that of wheat, or an average of 30.9 acres per square mile.

ABSTRACT FROM THE REPORT OF MR. BENJAMIN STUART, OF HANDLEY.

The kinds of land cultivated in cotton in this county are black waxy or hog-wallow prairie land, red sandy timbered land, and black sandy land.

The *black waxy prairie land* is of uniform character to depths varying from 1 foot to 6 feet to the underlying limestone, and it is very black, without sand or grit, and very adhesive when wet. It is all prairie, and embraces three-fourths of this county, extending 125 miles north, 200 or more miles south, 150 miles east, and 175 miles west. The underlying limestone is generally white, inclined to be soft, pulverizes

under a wagon wheel, and occurs in small lumps. The soil is well drained, but is later than the sandy soils. Tillage is usually easy, but is difficult when the soil is too wet. This land is well adapted to wheat and cotton, but is often too dry for corn. One-third of its cultivated area is planted in cotton. The plant usually attains the height of 4 feet, and is most productive at that or 6 inches less. It inclines to run to weed in very wet seasons; but topping will restrain its growth, and cause it to spread and to boll better. The seed-cotton product per acre of fresh land is from 1,500 to 2,000 pounds. Ten years' cultivation causes no diminution of production, and there is but little difference in the quality of the staple. Very little of this land lies "turned out", and the best quality is almost inexhaustible. None of it is yet "worn out", but it is believed that deeper tillage and rest would improve some of it. The most troublesome weed is cocklebur. The valley lands are improved by the washings from the uplands.

The *red sandy timbered land*, covering about one-fifth of the county, extends the entire length of the cross timbers, and is from 10 to 20 miles wide. Post oak is its characteristic growth. The soil is fine, red sandy, and from 1 foot to 2 feet deep; the subsoil is generally a red clay. The soil is early, warm, and well drained, always easily cultivated, and is apparently best adapted to cotton and corn. Of wheat it produces a good quality, but the yield is insufficient. Fully one-half the cultivated soil is planted in cotton. The plant attains a height of from 4 to 6 feet usually, and is more productive at the medium; it inclines to run to weed only in wet seasons. The product per acre of fresh land in good seasons is 2,000 pounds. This soil produces very well for a few years and then declines. The staple from old land is a little inferior in quality to that from new land. A very small amount of this land lies "turned out", and it does not improve so much by rest and deep plowing as the black waxy soil does. Crab-grass is the chief of weeds on this soil, and is very troublesome in wet seasons. The extent of the damage done to slopes by washing and gullying of the soil is rather serious; the washing, however, improves the lower lands. No special efforts have been made to check the damage to slopes.

The *black sandy land* is chiefly prairie, and occurs in small bodies. It is a black, fine sandy loam from 1 foot to 4 feet deep, and rests on limestone. This soil is early, warm, well drained, and easily tilled, and is apparently best adapted to corn and cotton. One-third of its area is planted in cotton. In fair seasons the plant attains a height of 5 feet, and it is most productive at from 4 to 5 feet. It is inclined to run to weed only in wet seasons. The seed-cotton product per acre of fresh land is from 1,500 to 2,000 pounds, of a quality already noted for the other soils, and is no less after ten years' cultivation. Very little of this land lies "turned out", and has not again been cultivated; but it is supposed that rest and deep plowing would restore its fertility. The damage done to slopes by washing and gullying is very slight, and no efforts have been made to check it. The washings improve the quality of the lower lands. Sunflower and careless-weed are the most troublesome. With good seasons the lands of this county always produce a bale of cotton per acre; but they often fail to produce so much, owing to drought, which causes it to shed its forms. This is the greatest difficulty with which we have to contend in raising cotton.

Shipments are made from October to January either to Saint Louis, New York, New Orleans, or Galveston.

PARKER.

Population: 15,870.—White, 15,250; colored, 620.

Area: 900 square miles.—Woodland, greater part; central black prairie region, 310 square miles; upper cross timbers, 590 square miles.

Tilled lands: 78,707 acres.—Area planted in cotton, 15,036 acres; in corn, 24,987 acres; in oats, 2,253 acres; in wheat, 12,306 acres.

Cotton production: 4,454 bales.—Average cotton product per acre, 0.30 bale, 450 pounds seed-cotton, or 150 pounds cotton lint.

Parker county is hilly and broken, and is about equally divided between prairie and timbered lands. It is watered by the Brazos river and its tributaries on the west and southwest, and by the small tributaries of the Trinity on the east. The wide belt of upper cross timbers passes through it from the north to the Brazos river. Its eastern limit is 3 miles to the east of Weatherford, the county-seat; its western, at or near the county-line. Its continuity is, however, broken by a range of high and bald prairie hills a few miles west of the town, which present bold and abrupt sides to the west, and overlook the broad timbered region still westward. Cretaceous limestones outcrop in ledges on the sides of these hills, and contain an abundance of the fossils of the formation.

The lands of the timbers are sandy, with also a yellowish sandy subsoil, underlaid by sandstone at a depth of several feet. This rock is being quarried for grindstones. The timber growth of the belt is mostly post and black-jack oaks. The valley lands have a dark-loam soil, and are said to produce 800 pounds of seed-cotton per acre. The sandy uplands are not much under cultivation. The open prairies have the usual black waxy soil, which are tillable only in the valleys between the hills, whose sides and summits are mostly covered with the Cretaceous limestones, and a thin soil often filled with gryphæas. These prairies are mostly devoted to the grazing of stock, and are but little under cultivation.

The tilled lands average 87.4 acres per square mile, and the crops comprise corn, cotton, small grain, and potatoes. Parker is one of the chief wheat-producing counties of the state, and ranks as ninth. The acreage devoted to corn is greatest, that of cotton being but little more than that of wheat, and averaging 16.7 acres per square mile. The county stands low in the list of counties with regard to product per acre.

Shipments of cotton are made by railroad eastward.

HOOD.

Population: 6,125.—White, 5,927; colored, 198.

Area: 490 square miles.—Woodland, greater part; central black prairie region, 80 square miles; upper cross timbers, 410 square miles.

Tilled lands: 34,819 acres.—Area planted in cotton, 7,139 acres; in corn, 10,427 acres; in oats, 605 acres; in wheat, 4,355 acres.

Cotton production: 1,966 bales; average cotton product per acre, 0.28 bale, 420 pounds seed-cotton, or 140 pounds cotton lint.

The surface of Hood county is rolling and somewhat hilly, with a few high and prominent peaks. Through its center, from northwest to southeast, flows the Brazos river, its bottoms and adjoining uplands forming a belt of timbered lands from 5 to 10 miles wide. The rest of the county is chiefly an open prairie, interspersed with narrow belts of timbered lands lying along the small streams. Comanche peak is the most prominent point in these

prairies, and can be seen from a great distance. It has an elevation of 600 feet above the Brazos river. Its sides are abrupt, exposing the different beds of Cretaceous limestones and fossils, the lowest of which is very similar in character to the hard and partly siliceous rock occurring in the western part of Erath county. The soil of the prairie valley lands is black and waxy in character, more or less sandy in localities, and very productive. The timbered uplands of the river have a sandy soil, varying in depth from 10 to 18 inches, and a reddish clay subsoil, and are known as "post-oak lands", from the predominance of that growth. The river bottoms comprise both the first, or those liable to overflow, and the second bottoms, which are not thus liable, and are largely in cultivation. The latter have a deep red sandy loam soil and a growth of live and post oaks, pecan, sumac, etc. (See analysis, page 45). These river lands (upland and bottom) comprise the greater part of the cultivated lands of the county, which average 71 acres per square mile. Corn has the largest acreage, that of cotton being next, with an average of 14.6 acres per square mile.

ABSTRACT FROM THE REPORT OF G. E. WALLS, OF GRANBERRY.

The *post oak lands* of the river are considered the best of the county. They yield more per acre, the soil is warmer than any other, and cotton starts off better and is two weeks earlier; the land also stands severe droughts better. The soil is sandy, and has a depth of 18 inches, with a red-clay subsoil from 10 to 40 feet deep. The *black prairie lands* cover the largest part of the county. They are easily tilled, and are best adapted to wheat. Cotton comprises one-third of the crops, grows 5 feet high, and is most productive at 4 feet, yielding 1,250 pounds of seed-cotton per acre. Topping the plant is practiced to prevent its running to weed. Crab-grass is most troublesome on these prairie lands.

Shipments of cotton are made to Cleburne or to Fort Worth.

ERATH.

Population: 11,796.—White, 11,539; colored, 257.

Area: 1,000 square miles.—Woodland, nearly all; central black prairie region, 40 square miles; northwestern red-loam region, 250 square miles; upper cross timbers, 710 square miles.

Tilled lands: 61,647 acres.—Area planted in cotton, 14,220 acres; in corn, 19,702 acres; in oats, 1,822 acres; in wheat, 5,832 acres.

Cotton production: 2,857 bales; average cotton product per acre, 0.20 bale, 300 pounds seed-cotton, or 100 pounds cotton lint.

Erath is a rolling and somewhat hilly county, situated on the west side of the central prairie region and partly included in the northwestern red-loam region. The belt of upper cross timbers passes through the county, but is interrupted by high and bald prairie ridges of the central prairie region, whose sandstone and limestone rocks, with characteristic fossils, are found outcropping on their sides and summits. The timbers occupy the low valley lands between these ridges. Its soil is in many places but little else than a deep white sand, especially on the west of Stephenville, the county-seat. On the prairies there are occasional clumps of live oaks, the soil being a dark sandy loam or stiff clay. The population of the county is very sparse, being only an average of about 12 persons per square mile. Lands under cultivation average 61.6 acres per square mile. Corn is the chief crop, its acreage being a third greater than that of cotton, which averages 14.2 acres per square mile. The yield in seed-cotton for 1879 was only 300 pounds.

ABSTRACT FROM THE REPORT OF J. G. O'BRIEN, OF DUBLIN.

The uplands of the county are mostly rolling, two-thirds being timbered with post oak, the rest being open and rocky prairies, with black waxy soils. The bottom lands of Leon river and tributary creeks have a fine black sandy soil, and are tillable. The lands devoted to cotton comprise deep black fine sandy, a lighter grade of the black sandy, and a mixture of black waxy and sandy.

The *black sandy timbered land* is best adapted to the cultivation of cotton, and extends 25 miles to the southeast, about the same distance to the north and east, with some alternations, and about 10 miles southwest, changing to a lighter grade in the west. Post oak principally, with some live oak, cottonwood, hackberry, sumac, and pecan, is the natural timber growth. The soil is a black fine sandy loam 3 feet in depth, having a subsoil of impervious red or pipe-clay, the pipe-clay being generally on creek bottoms and prairies. It contains gravel, and is underlaid by sand and gravel. The soil is early, warm, tolerably well drained, and remarkably easily tilled in dry seasons. The chief crops of the county are: for the market, cotton, corn, wheat, and oats; for home use, potatoes, fruits, millet, and hay. The lowlands are best adapted to wheat; but at least one-half the crops planted is in cotton. The uncertainty of rain is the greatest drawback, and good acreage of cotton could be made if there was plenty of rain and an early spring. The late frosts occasionally kill the cotton, but as planting is usually done about the middle of April the effect of the frost is not great. Cotton usually attains a height of from 2 to 6 feet, the height at which production is the best being 3 or 4 feet. Cotton runs to weed during very wet seasons, which is prevented and bolting facilitated by topping. From fresh land the product per acre in seed-cotton is from 300 to 800 pounds, rating as low middling, from 1,475 to 1,660 pounds, according to the variety of cotton, being required to make a 475-pound bale. After the land has been in cultivation for three years the yield per acre of seed-cotton is from 750 to 2,500 pounds, according to the season, 1,900 pounds being necessary to make 475 pounds of lint of better staple. Sunflower, cocklebur, and occasionally crab-grass and purslane, are the most troublesome weeds, although in many localities the careless-weed, nettle, and lamb's-quarter are the greatest source of annoyance. None of this land lies "turned out".

The lighter grade black sandy land is commonly known as the *second-rate black sandy*. It comprises about one-sixth of the tillable land, occurring only in spots, the natural timber being squatty post oak. The soil is a light, blackish, fine sandy loam, from 2 to 6 inches in depth, and easily tillable in either wet or dry seasons; and is early, warm, well drained, and best adapted to cotton and corn. The subsoil is generally a clay, containing white angular gravelly pebbles. Two-thirds of the crops planted is cotton, which reaches a height of from 18 to 30 inches, the latter being most productive; it runs to weed in very wet seasons, though not generally so disposed. On fresh land the product per acre in seed-cotton is from 300 to 500 pounds, 1,660 pounds being required for a 475-pound bale. The rating is low middling for fresh land. For land three years under cultivation it is better, the yield per acre for such land being from 1,000 to 1,800 pounds of seed-cotton, 2,000 pounds of which are needed for a 475-pound bale.

The mixture of black sandy and black waxy is commonly designated as *black waxy prairie land*, and, like the previously-described land, it occurs only in spots, and forms about one-sixth of the surface of the county. The soil is a fine silty, shelly, slightly putty-like prairie soil, 2 inches deep, not easily tillable in wet seasons, but more so in dry ones; it is late, cold, and well drained, and is best adapted to corn and wheat. The subsoil is mostly pipe-clay, sometimes rock, containing hard black gravel, underlaid by rock at from 2 to 4 feet. Very little cotton is grown on this land, the height attained being about 1 or 2 feet. The fresh lands yield from 200 to 400 pounds of seed-cotton per acre; on the land after three years' cultivation the yield is from 700 to 800 pounds, the lint rating as good ordinary.

Shipments are made during the fall by means of wagon to Fort Worth and Waco, the rate being \$2 or \$2 50 per bale.

SOMERVELL.

Population: 2,649.—White, 2,621; colored, 28.

Area: 200 square miles.—Woodland, small part; central black prairie region, 160 square miles; upper cross timbers, 40 square miles

Tilled lands: 15,609 acres.—Area planted in cotton, 4,030 acres; in corn, 5,629 acres; in oats, 238 acres; in wheat, 1,603 acres.

Cotton production: 1,066 bales; average cotton product per acre, 0.26 bale, 390 pounds seed-cotton, or 130 pounds cotton lint.

Somervell is one of the smallest counties in the state, and is divided by the Brazos river, which flows through it in a zigzag course from north to south. The surface of the country is rolling, with a few prominent bald hills and peaks, and, with the exception of the river bottoms and their adjoining uplands, is an open prairie. Rotten limestone, is the prevailing rock. The soil of the prairies is a black waxy clay or adobe, and is not much under cultivation, being chiefly devoted to grazing purposes. On the edge of these prairies this soil becomes commingled with the sands of the timbered lands, but retains its black color, and is known as black sandy soil. The uplands near the river have chiefly a timber growth of post oak and a gray sandy soil, very productive, and are to some extent under cultivation. The red alluvial loam of the river bottoms is preferred for the crops of the county, and is the one chiefly under cultivation. Tilled lands average 78 acres per square mile, the average of cotton being 20.2 acres.

ABSTRACT FROM THE REPORT OF SCOTT MILAM, OF GLENROSE.

The lands of the county are the alluvial loam of the Brazos river, black waxy, mulatto, black sandy, and sandy post oak.

The chief soil is the *alluvial loam* of the river bottom, which comprises one-fortieth of the whole county. The timber growth of these bottoms is cottonwood, poplar, black walnut, pecan, ash, elm, and cedar. The soil is a black sandy loam, sometimes mulatto in color, from 1 foot to 3 feet deep, with a yellowish clay subsoil, which occasionally contains pebbles. The soil is early, well drained, and easily tilled, yielding about 40 bushels of wheat, 60 bushels of corn, or about 1,680 pounds of seed-cotton per acre, making 500 pounds of lint. Cotton comprises one-fourth of the crops, the chief of which are wheat, corn, cotton, oaks, barley, rye, millet, and Hungarian grass; also peaches, cherries, and grapes. Cotton grows to a height of from 4 to 5 feet, being most productive at the latter, and seldom inclines to run to weed, except in the wet, warm weather in June; topping is the remedy applied. The yield per acre of seed-cotton on old land is, as on fresh land, 1,000 pounds, 1,600 pounds on fresh and from 1,545 to 1,720 pounds on old land being necessary for a 475-pound bale of middling and low middling lint. Careless, crab-grass, purslane, and cocklebur are the most troublesome weeds. None of this land lies "turned out"; it does not wash on slopes.

River bottom lands are generally preferred for cotton, although the post-oak lands average quite as much, and stand the drought much better. Cold nights on the last of April and first of May generally give cotton what is known by farmers and planters as "sore-shin". In the fall the Rocky mountain locust or grasshopper sometimes injures the crop.

As soon as ginned, cotton is hauled at the rate of \$1 50 per bale to Fort Worth by wagon, and thence shipped to Galveston by railroad at 12 cents per pound.

JOHNSON.

Population: 17,911.—White, 17,337; colored, 574.

Area: 690 square miles.—Woodland, small part; central black prairie region, 520 square miles; lower cross timbers, 170 square miles.

Tilled lands: 134,842 acres.—Area planted in cotton, 40,446 acres; in corn, 38,151 acres; in oats, 5,528 acres; in wheat, 14,339 acres.

Cotton production: 13,778 bales; average cotton product per acre, 0.34 bale, 510 pounds seed-cotton, or 170 pounds cotton lint.

The surface of Johnson county is high and rolling, but the greater part is an open prairie, with a few prominent hills. The belt of lower cross timbers passes through from north to south immediately east of Cleburne, the county-seat. This belt has a width of 10 or 15 miles, and retains the characteristic features of deep sandy lands, ferruginous sandstones, brown and reddish gravel, and a growth of post and black-jack oaks that are seen in other counties. At Cleburne it occupies a valley, being much lower than the general level of the prairies. Its own surface is, however, somewhat hilly in places.

The prairie lands are of the black waxy character peculiar to the central region, free from timber, and devoted principally to stock-grazing. (See analysis, page 36.) Rotten limestone outcrops on the hills, but is deeply covered by the soil in the valleys. The county is watered by the headwaters of Chambers and Noland's creeks, the Brazos river touching the southwestern corner.

Johnson is an agricultural county, 30.5 per cent. of its area being under cultivation, averaging 195.4 acres per square mile. Corn has the largest acreage, that of cotton averaging 58.6 acres per square mile.

ABSTRACTS FROM THE REPORTS OF J. B. ALLARD, E. E. SKIPPER, AND W. A. MENAFEE, OF CLEBURNE.

The uplands of the county are mostly rolling prairies, and the lands under cotton cultivation comprise the black waxy of the prairies and of the valleys of Noland's river, the sandy lands of the cross timbers, and the sandy and mahogany of the prairies.

The most important soil is the *black waxy*, of which one-third of this county is composed. The natural timber is post oak in the cross timbers, with some black-jack, hickory, and elm, pecan, walnut, ash, hackberry, cottonwood, and various other kinds on the water-courses. The soil is a black prairie clay from 2 to 5 feet in depth, underlaid in the black lands sometimes by a yellowish clay, but mostly by gravel and limestone, and in the timbers mostly by red clay, gravel and sand-rock occasionally; the subsoil itself is underlaid by sand, gravel, and rock at from 2 to 10 feet. The soil is early, warm, and well drained, and is easily tillable in dry seasons.

The chief crops are corn, wheat, oats, and cotton, each of which does equally well in favorable seasons. Early frosts prevent early planting. Planting is generally done from the 1st to the 20th of April. The June and July drought frequently damages the cotton crop, causing it to shed its bolls, and also producing "motes" in the lint, which pass through the gin. Cotton comprises one-third of the crops, growing from 2 to 4 feet high on the black, and from 2½ to 5 feet on the sandy lands. It is most productive at 3 feet on the former, and 4 on the latter, but runs to weed in warm and wet springs and summers, and yields from 1,000 to 2,000 pounds of seed-cotton per acre, the staple rating from middling to middling fair. After twenty years' cultivation the yield is about the same as on fresh land, except on the sandy lands, where there is a slight falling off. Rag-weed on the black lands, and rag-weed and crab-grass on the sandy lands, are most troublesome. No lands have been turned out to rest. Only the sandy lands are liable to wash and gully on slopes.

As fast as cotton is ginned it is hauled by wagon to Cleburne, Fort Worth, Dallas, or Waco, the freight being \$1 per bale to Fort Worth.

ELLIS.

Population: 21,294.—White, 18,755; colored, 2,539.

Area: 950 square miles.—Woodland, very little; all central black prairie region.

Tilled lands: 172,084 acres.—Area planted in cotton, 52,172 acres; in corn, 42,899 acres; in oats, 5,533 acres; in wheat, 18,500 acres.

Cotton production: 18,956 bales; average cotton product per acre, 0.36 bale, 540 pounds seed-cotton, or 180 pounds cotton lint.

Ellis is an open prairie county, with a surface partly rolling and partly level, and watered by the Trinity river and its tributaries, which flow eastward, the river forming its eastern boundary. These streams usually have narrow skirts of sandy lands along their borders, timbered mostly with post oak. The river lands have a deep and dark alluvial soil and a timber growth of walnut, ash, elm, pecan, bois d'arc, and cottonwood, and are generally subject to overflow, and therefore not under cultivation.

The prairie lands near the timbers are black sandy in character and very productive, but over the greater part of the county they are black and waxy, with a stiff yellowish subsoil, underlaid by the white rotten limestone that is characteristic of the central prairie region. (See analysis, page 36.) The yield per acre is about 750 pounds of seed-cotton in fair seasons.

Ellis is chiefly an agricultural county, the lands under cultivation comprising 28.3 per cent. of its area, and averaging 181 acres per square mile.

Cotton is the chief crop, its acreage being greater than that of any other crop, and is surpassed by but three counties in the state, viz, McLennan, Washington, and Fayette. Its cotton average per square mile is 54.9 per cent., that of the counties of Johnson, Washington, Fayette, Camp, and Robertson being greater. The average product per acre for 1879 was low in comparison with very many other counties. In the production of wheat Ellis county ranks as fifth.

ABSTRACTS FROM THE REPORTS OF S. C. TALLEY, OF CHAMBERS CREEK; G. W. COOPER, OF BRISTOL; GEORGE W. HAMLETT, OF MILFORD, AND JAMES E. SMITH, OF WAXAHACHIE.

On the lowlands the cotton is liable to injury from heavy spring rains, which cause it to have the sore-shin, and in the fall is usually killed by frosts from two to four weeks earlier than on the uplands; still the bottom land, where it can be cultivated, produces from one-fourth to one-third more cotton per acre, because it endures the summer droughts better. The cultivated land comprises the following different varieties: The black upland prairie, which embraces at least 90 per cent. of all the cultivated lands of the county; the dark loam all above overflow, being deposits from the uplands; and the black sandy soil along the Trinity river.

The *black waxy prairie* soil, which is the most important, is from 3 to 15 feet in depth, with a subsoil of yellowish clay, which is seldom reached except when digging wells, and does not lose its identity after being mixed with the surface soil; it is quite impervious when undisturbed, and contains pebbles and shells. Limestone is found at from 10 to 35 feet. Mesquite is the natural growth. When not too wet, the soil is early; it is rather difficult to till in wet but easy in dry seasons, producing cotton, corn, wheat, oats, barley, rye, and potatoes, though best adapted to cotton, corn, and oats, from one-third to one-half of all the crops planted being in cotton, which grows to a height of from 2 to 5 feet, producing most at 3 feet, and tending to run to weed in wet seasons in July and August. Topping and rapid cultivation are the remedies applied. The yield per acre from fresh land is from 500 to 1,000 pounds; from 1,300 to 2,000 pounds after one year's cultivation; from 800 to 1,200 pounds after two years' cultivation, and from 1,000 to 1,500 pounds after twenty years' cultivation. In each of the above cases the amount necessary for 475 pounds of lint is from 1,425 to 1,900 pounds, and the rating of the staple in all cases is middling. Numerous varieties of careless, rag, sunflower, cocklebur, sand briers, and nettles are the troublesome weeds.

The *gray sandy lands* cover about 2 per cent. of the tillable area, and occur along or near the streams. Post oak, elm, hackberry, yellow locust, with some pecan, comprise the natural growth. The soil, 2 feet in depth, has a subsoil of bluish yellow clay, mixed with soft rock, underlaid by limestone and joint clay at 12 feet. It is easily tilled in wet and moderately so in dry seasons, and is early, warm, and generally well drained. In warm, wet weather the cotton runs to weed. The usual height to which it grows is 2 feet, yielding 400 pounds of seed-cotton per acre, which yield is not altered by cultivation, the lint rating as second class. Spanish nettles, bur, sunflowers, etc., constitute the troublesome weeds. No land lies "turned out". The same may be said of all lands of the county.

Shipments are usually made as soon as ginned, by wagon, to the nearest depot, and thence by rail to Galveston, Houston, and Saint Louis, the rate being \$4 50 per bale.

NAVARRO.

(See "Oak, hickory, and pine region".)

HILL.

Population: 16,554.—White, 15,256; colored, 1,298.*Area*: 1,000 square miles.—Woodland, over one-third; central black prairie region, 710 square miles; lower cross timbers, 290 square miles.*Tilled lands*: 135,381 acres.—Area planted in cotton, 38,535 acres; in corn, 33,013 acres; in oats, 4,475 acres; in wheat, 6,533 acres.*Cotton production*: 8,369 bales; average cotton product per acre, 0.22 bale, 330 pounds seed-cotton, or 110 pounds cotton lint.

Hill is one of the central agricultural counties of the state, and is bounded on the west by the Brazos river, into which flows the many creeks of the county. Its surface is undulating, with broad and open prairies on the east, covered only with grass and a few scattered "motts" of oaks, and comprising about one-half of the county area. These prairies have the black waxy soils that characterize the central prairie region, with the usual change to black sandy near the timbered lands that are found adjoining the streams and that form the southern terminus of the "lower cross timbers", and have a width of from 10 to 15 miles. The eastern edge of this belt passes a few miles west of Hillsboro', the county-seat, and has a deep sandy soil, somewhat reddish in color, from the ferruginous sandstone that caps the low hills within the belt.

On the west of the timbers, and extending to the river uplands, is a belt of undulating prairies, with soils varying from the black hog-wallow to the red sandy loam. Cretaceous limestone underlies both these and the prairies on the east of the cross timbers, outcropping in many places.

The river lands comprise a first bottom of red alluvial loam, with a width of from one-half to two miles, and are heavily timbered with cottonwood, walnut, pecan, ash, elm, etc., and a second bottom of light sandy loam soils having a timber growth of post and black-jack oaks, hickory, and elm and a width of from 1 to 5 miles. These lands yield from 30 to 40 bushels of corn, or from 1,200 to 1,500 pounds of seed-cotton per acre. Hill is one of the few counties in the state having a wheat acreage of over 10,000 acres. Cotton is its chief crop, and averages 38.5 acres per square mile, or 28.5 per cent. of its tilled lands.

The population is very sparse, the average being only about 16.2 persons per square mile. The prairies are almost entirely devoted to grazing purposes. The lands under cultivation comprise 21.2 per cent. of the county area, and average 135.4 acres per square mile.

The following description has been furnished by Mr. D. D. Sanderson:

The following is a summary of the various features of the county from the Brazos river eastward:

1. River bottom of deep reddish alluvial soil.
2. A second bottom, gradually ascending from the first, from 1 mile to 5 miles. The soil is a light sandy loam, with a growth of post oak, hickory, red elm, and black-jack oak, producing 25 or 30 bushels of corn and from 1,000 to 2,000 pounds of seed-cotton per acre in an ordinary season.
3. A continuous, irregular belt or range of elevated white limestone and hilly prairie, too rocky for cultivation, producing fine mesquite, bunch, and blue-sedge grass, with occasional elevated motts of post oak.
4. At a lower altitude is an arable prairie, level and gently undulating to the foot of the cross timbers. The soil is in very irregular and diversified tracts of red loam and deep sticky black, smooth, or hog-wallow prairies, through which many small streams flow west to the river.
5. The cross timbers have generally a reddish sandy loam soil, with occasional rocky hills, mostly of sandstone. Thence east to the Navarro county-line there is a vast undulating, rich black prairie, thinly settled.

ABSTRACTS FROM THE REPORTS OF D. D. SANDERSON, OF WHITNEY, W. S. THOMAS, OF IRENE, AND JOHN P. COX, OF HILLSBORO'.

The agricultural lands devoted to cotton comprise the black waxy prairie, the sandy valley of the Brazos river, and the sandy post-oak uplands. The *black waxy prairie* covers about one-half of the county, and varies greatly in color, but becomes uniform after cultivation. It is from 2 to 4 feet in depth, and is underlaid by blue marl or rotten limestone, so common in these regions. It is early, warm, well drained, and rather difficult to till in wet seasons. The chief crops are cotton, corn, wheat, oats, and sorghum. The first of these comprises about one-third of all the crops, grows to a height of 3 or 4 feet, rarely runs to weed, and yields from 1,000 to 2,000 pounds of seed-cotton per acre; 1,665 pounds are required to make a 475-pound bale of lint, which rates from middling to fair.

Long cultivation does not diminish the yield, but shortens the staple and diminishes the number of bolls on the stalk. No land lies "turned out". The most troublesome weeds are sunflower, cocklebur, and rag-weed, and these occur on all lands in the county.

Additional abstract from the report of D. D. Sanderson.

The *red lands* cover about one-fourth of the county, extending from the Brazos river eastward 10 or 15 miles in irregular areas, and contain more soil than the black land. The growth is live and post oak, and mesquite on the prairies. The soil is a red sandy loam from 1 foot to 3 feet in thickness, underlaid by a subsoil heavier, and generally mixed with sandstone, rounded drift gravel, and some iron ore. It is easily tilled if broken during winter, is early, warm, and well drained, and produces cotton, corn, wheat, rye, oats, barley, and fruit; the first forms about one-third of all the crops, growing to a height of 3 feet, and running to weed in wet seasons, restraint not being necessary. The product per acre in seed-cotton is from 1,000 to 1,800 pounds, 1,665 pounds of which are needed for 475 pounds of lint, rating as middling to good middling. After ten years' cultivation there is no difference either in yield or rating.

Sandy post-oak lands also cover about one-fourth of the county, and are included in the cross timbers. The natural growth is post and black-jack oaks, elm, mesquite, and green brier. The soil is almost of every variety, and has a depth of 1 foot. The subsoil is a red or blue clay, with some red and gray sandstone, and coarse pebbles at the depth of 10 feet. The land is easily cultivated in all seasons, is early, warm, and well drained, producing cotton, corn, etc. Cotton constitutes one-third of the crops, grows to a height of from 2½ feet to 4 feet, and has not been known to run to weed on these lands; it yields from 800 to 2,000 pounds of seed-cotton per acre, 1,665 pounds being required for 475 pounds of lint, which rates as in the last case. No difference is perceptible after ten years' cultivation.

All arable lands that have been fallowed early in winter from 12 to 20 inches deep, and planted from the 15th to the 20th of April on low beds or level land, have never failed to produce good crops of cotton, and with half the labor required in the states east of Texas. It matures on all our soils long before frost, the climate being all that could be desired to perfect the cotton-plant. The picking season, from the 20th of August to 1st of January, being generally rainless, is highly favorable to saving large crops in good condition.

Shipments are made from October to January, by rail, to Galveston and Saint Louis, the rate being \$4 50 per bale.

BOSQUE.

Population: 11,217.—White, 10,718; colored, 499.

Area: 1,000 square miles.—Woodland, some; central black prairie region, 990 square miles; upper cross timbers, 10 square miles.

Tilled lands: 68,981 acres.—Area planted in cotton, 19,624 acres; in corn, 22,491 acres; in oats, 2,273 acres; in wheat, 9,503 acres.

Cotton production: 3,833 bales.—Average cotton product per acre, 0.20 bale, 300 pounds seed-cotton, or 100 pounds cotton lint.

The county of Bosque is divided between timber and prairie, the latter being high and rolling, with the usual black waxy and black sandy soils of the region. On the northwest there are some high hills, which are covered with a scrubby growth of cedar and other trees. Rotten limestone prevails everywhere, outcropping on the sides of the hills and in the banks of the streams. In the valleys it is covered by the clay deposits from the hills.

The Brazos river forms the boundary on the east, and with its rich reddish and dark alluvial bottoms furnishes a large amount of valuable land, yielding usually a bale of lint per acre. Timber is more plentiful in the eastern and northwestern parts of the county. The lands under cultivation comprise 10.8 per cent. of the county area, averaging about 69 acres per square mile. Of the latter, 19.6 acres is devoted to the culture of cotton, the average yield per acre of which was, in 1879, very small.

ABSTRACT FROM THE REPORT OF T. W. ARCHIBALD, OF CLIFTON.

This is a high, dry country, not well adapted to the growth of cotton, but sometimes in seasonable years we have very fine cotton crops. The lands of the county comprise black sandy uplands and the black loam soil of the second valley of Bosque river.

The chief soil is the *black upland prairie*, which comprises two-thirds of and extends throughout the county. The natural timber on the creeks is cottonwood, hackberry, sycamore, pecan, elm, walnut, and burr oak; on the mountains, elm, brush cedar, spotted oak, ash, etc. The soil is a black prairie adobe, 2 feet in thickness, underlaid by a subsoil of mixed gravel and clay, rock being from 20 to 25 feet from the surface. The land is easily tillable, except in wet weather. The drainage is natural. The crops of the county are corn, wheat, and cotton, but the soil is best adapted to wheat. Cotton grows to a height 4 feet, and yields from 800 to 1,000 pounds of seed-cotton. About 1,660 pounds are required for 475 pounds of lint, which rates as low middling. This land has been in cultivation but a short time. The most troublesome weeds are careless, nettle, sunflower, and burs. The soil washes readily on slopes, but the damage arising from such washings is of no serious extent. The valleys are not injured by the washings of the uplands.

The *high prairie timbered lands* comprise about one-sixth of the county, and are in the northwestern part. The natural timber on these lands is post-oak, black-jack, elm, and live oak. The soil is a red-clay loam, very productive, about 1 foot in depth, and is underlaid by a red-clay subsoil, sand and blue limestone being from 15 to 20 feet from the surface. The soil is early, warm, well drained, and best adapted to cotton, which forms 50 per cent. of the crops planted. Tillage is easy and pleasant in dry seasons. Cotton grows to a height of 4 feet, the greater the weed the greater the yield. The seed-cotton product per acre is from 800 to 1,000 pounds, 1,665 pounds being necessary for 475 pounds of low middling lint. No land lies "turned out". Crab-grass and careless nettle are the most troublesome weeds. The soil washes on slopes, but the damage is not serious, the valleys not being injured by the washings. No efforts have been made to check the damage.

The shipments of cotton are made, from the time ginning commences, by wagon to Waco and Fort Worth, the freight by wagon being \$1 50 per bale.

COMANCHE.

(See "Northwestern red-loam region".)

HAMILTON.

Population: 6,365.—White, 6,341; colored, 24.

Area: 980 square miles.—Woodland, a large part; central black prairie region, 830 square miles; upper cross timbers, 150 square miles.

Tilled lands: 35,604 acres.—Area planted in cotton, 6,840 acres; in corn, 12,941 acres; in oats, 723 acres; in wheat, 3,772 acres.

Cotton production: 1,147 bales.—Average cotton product per acre, 0.17 bale, 255 pounds seed-cotton, or 85 pounds cotton lint.

Hamilton is a high and hilly prairie county, watered by the Leon river and Cowhouse and Lampasas creeks, and their tributaries, all flowing in a southeasterly course and uniting in the counties south. They have a timber growth of water oak, elm, pecan, and cottonwood. The hills and ridges are high, broken, and abrupt, with ledges of Cretaceous limestone and a growth of cedar, etc. The lands of the county comprise the black waxy soils and subsoils of the prairies, gray sandy soils in the timbered post and black-jack oak lands along the streams, with the intermediate black sandy lands. Except in the valleys, the prairie lands, because of their rocky character, are not considered suitable for cultivation.

The county is very sparsely settled. The prairies are almost altogether without habitation, and are devoted to stock-grazing. The lands under cultivation average 36.3 acres per square mile. The cotton acreage is small as compared to that of the adjoining counties of Bosque, Lampasas, Coryell, and Comanche, while the product per

acre for 1879 (0.17 of a bale) was about equal in all of them, varying from 195 to 330 pounds of seed-cotton. This extremely small average for 1879 is due entirely to the unusual drought that prevailed in that year over western Texas. The lands are naturally as productive as lands of the same character in other counties of the region, whose yield in this same year was several times greater, and in good seasons is about 750 pounds of seed-cotton. The tilled lands of the county are chiefly devoted to corn, its acreage being nearly double that of cotton, which averages 7 acres per square mile.

LAMPASAS.

Population: 5,421.—White, 5,248; colored, 173.

Area: 850 square miles.—Woodland, nearly one-fourth; central black prairie region, 700 square miles; northwestern red loam, 150 square miles.

Tilled lands: 28,435 acres.—Area planted in cotton, 4,611 acres; in corn, 9,153 acres; in oats, 760 acres; in wheat, 3,633 acres.

Cotton production: 628 bales; average cotton product per acre, 0.14 bale, 210 pounds seed-cotton, or 70 pounds cotton lint.

Lampasas is a high and rolling prairie county, with high and abrupt ridges standing out so prominently over the surface that they have received the name of "mountains". These hills are largely destitute of timber, with the exception of many cedar brakes on their sides. Rotten limestone is the prevailing rock of these hills, outcropping in ledges and bluffs, but underneath this there is found in localities a sandstone, the lowest of the Cretaceous series of rocks. It is estimated that two-thirds of the surface of the county is an open prairie, having mostly the black waxy lands peculiar to the central prairie region. (See analysis, page 36.) The western part of the county has more timber, and the lands are sandy and belong to the red-loam region. The county is watered by the Colorado river and its tributaries on the west and Lampasas creek and its small tributaries on the east. A number of fine sulphur springs occur near the town of Lampasas, and are a great place of resort for people of central Texas. The prairies are mostly used for grazing purposes, as the population is sparse. The farms lie along the streams, the soil being of a black waxy or black sandy character and highly productive. The lands under cultivation average 33.4 acres per square mile. The average yield per acre of both corn and cotton for 1879 was very small, due evidently to the extreme drought of that year.

ABSTRACT FROM THE REPORT OF THOMAS J. DURRETT, OF LAMPASAS.

Three kinds of lands are found in this county, viz: Black waxy, in what is called the open valleys; cove and table-lands, some of the latter having a red clay subsoil; and grayish sandy next to the creek banks.

The chief soil is the *black waxy prairie*, which forms two-thirds of the tillable land of the county, extending 15 or 20 miles in a northwesterly direction, and about the same to the southeast. There is on this land no natural timber. On the creeks grow mesquite, elm, cottonwood, and burr, post, live and black-jack oaks, sycamore, sumac, some walnut, wild china, and chittim wood.

The *black soil* is a heavy prairie clay loam, from 18 to 20 inches in depth, with a dark reddish and dove-colored clayey, leachy subsoil, containing hard gravel, rounded pebbles on all streams, and is underlaid by gravel and concrete at from 5 to 15 feet. The soil is easily tillable in either wet or dry seasons, and is late (depending on the "northers" more than anything else), warm, and well drained. The chief crops are corn, wheat, oats, cotton, millet or Hungarian grass, and sweet potatoes. Cotton forms about one-third of the crops, growing to a height of about 3½ feet. Very wet seasons, and also deep cultivation when young, are favorable conditions for causing the plant to run to weed, the remedy for which, besides increasing the bolling, is surface culture. The yield per acre of seed-cotton is for fresh lands from 1,200 to 1,800 pounds; on lands under cultivation for thirteen years the yield is the same; from 1,426 pounds to 1,665 pounds are necessary in both cases to make a 475-pound bale of lint. The rating of the staple from fresh land is not so good as that from lands which have been under cultivation. Careless-weeds, cocklebur, and Spanish bur are the most troublesome weeds. Crab-grass is not troublesome. No land lies "turned out", and there is very little washing of the soil.

Shipments are made from October to Christmas, by means of wagons, to Round Rock, in Williamson county, the rate being from \$1 50 to \$2 per bale.

CORYELL.

Population: 10,924.—White, 10,539; colored, 385.

Area: 950 square miles.—Woodland, very little; all central black prairie.

Tilled lands: 78,763 acres.—Area planted in cotton, 19,688 acres; in corn, 22,993 acres; in oats, 2,733 acres; in wheat, 8,506 acres.

Cotton production: 3,331 bales; average cotton product per acre, 0.17 bale, 255 pounds seed-cotton, or 85 pounds cotton lint.

The surface of Coryell county is rolling or hilly, and is watered by Leon river and Cowhouse creek, which flow in a southerly course, and are separated by a line of hills partly timbered with live and post oaks. The greater part, probably two-thirds of the county, is an open prairie of black waxy land, tillable only in the valleys because of the rocky nature of the hills, rotten limestone outcropping everywhere. Timber is quite scarce, comprising post oak and mountain cedar. These prairies are almost entirely given up to grazing purposes, the county being very sparsely settled. The lands under cultivation average 82.9 acres per square mile, 20.7 of which are devoted to the culture of cotton.

ABSTRACT FROM THE REPORT OF THOMAS WILLIAMSON, OF PIDCOCK RANCH.

The lands of the county comprise the black prairie uplands and dark soils of the Cowhouse valley above overflow. The soils of the uplands do not vary in quality, and are black and rich, in tracts variously estimated from 10 to 200 acres. Cotton on the lowlands is from two to four weeks later than on the uplands, but usually matures well.

The *Cowhouse valley* is the chief cotton region of the county, but is not extensive, comprising but a small proportion of the county area. Its timber growth is pecan and elm. The hills have usually a growth of live and post oaks. These prairie soils have a depth of about 2 feet, and are underlaid at 10 or 20 feet by soft limestone. The soil is difficult to cultivate in wet weather, but easy in dry. It is late and ill drained, the chief crops being cotton, corn, wheat, oats, millet, sorghum, sweet and Irish potatoes. About one-third of the crops is in cotton, but the soil is best adapted to corn, wheat, and oats. Cotton grows to a height of 4 or 5 feet, runs to weed in wet weather, and produces 1,000 pounds of seed-cotton per acre, the lint rating as middling. After ten years' cultivation its yield decreases to 700 pounds, and rates as low middling, 1,660 pounds being then required for a 475-pound bale of lint. The careless-weed is the most troublesome. The soil does not wash readily, and scarcely any of it is "turned out".

In November, December, and January cotton shipments are made by wagon to Waco, and thence by railroad to Galveston, the rate being \$4 50 per bale.

MCLENNAN.

Population: 26,934.—White, 19,276; colored, 7,658.

Area: 1,080 square miles.—Woodland, nearly one-fifth; central black prairie, 980 square miles; lower cross timbers, 100 square miles,

Tilled lands: 203,882 acres.—Area planted in cotton, 53,394 acres; in corn, 43,357 acres; in oats, 9,091 acres; in wheat, 18,682 acres.

Cotton production: 12,777 bales; average cotton product per acre, 9.24 bale, 360 pounds seed-cotton, or 120 pounds cotton lint.

McLennan, one of the central counties of the state, is divided by the Brazos river, which crosses it from northwest to southeast. The surface of the county consists of high and rolling prairies, and, along the river and its tributaries, belts of timbered lands. The timbered river uplands are broad and sandy, and have a growth of post oak and other timber. The subsoil is clayey in character, and the lands are said to produce as much as 700 pounds of seed-cotton per acre. The bottom lands have a red-loam soil, and are by many considered the best lands in the county. The timber growth is cottonwood, pecan, elm, etc. Rotten limestone (Cretaceous) underlies these bottom lands, outcropping in the banks of the river at Waco and elsewhere. On the prairies this rock is again found on the hills, where it approaches very near the surface; but in the valleys it is deeply covered by the soil which has accumulated from the hillsides. These prairie lands are of the black waxy nature peculiar to the central region, but near the sandy timbered lands the soil becomes more or less mixed with sand, forming what is termed black sandy soil, or terminus of the lower cross timbers. (See analysis, page 36.)

Lands under cultivation in this county comprise 29.5 per cent. of the area, and average 188.8 acres per square mile. There are but five counties having a greater proportion of tilled lands, viz, Washington, Dallas, Johnson, Collin, and Grayson.

McLennan ranks as first in the state in quantity of wheat product, though the acreage of that crop is less than in three other counties. Cotton is, however, the chief crop, but while in acreage it ranks as third, it is only nineteenth in the state in the number of bales for 1879. Its average acreage per square mile is 49.4.

ABSTRACTS FROM THE REPORTS OF J. H. EARLE AND D. R. GURLEY, OF WACO, AND C. A. WESTBROOK, OF MASTERSVILLE.

The bottoms of the Brazos river comprise a large body of rich lands, having a red or chocolate clay and sandy soil, covered with a growth of cottonwood, pecan, hackberry, elm, and boxwood. Beds of sand and gravel underlie this soil at a depth of 15 feet. The other lands of this section devoted to the cultivation of cotton are the black rolling prairie and the hog-wallow prairies.

The most important of the above is the *Brazos bottom land*, the soil of which, under proper management, is easily tilled in dry seasons or in wet ones. It is early, warm, and well drained, and produces cotton, corn, wheat, and oats, though it is apparently best adapted to cotton and corn, the former constituting two-thirds of the crops. The height usually attained by the plant is 5 feet, at which it is most productive, although in wet seasons it sometimes reaches as high as 6 or even 8 feet, when it runs to weed. Land after being cultivated for 15 years shows no difference as far as the yield and the rating of the cotton are concerned. From fresh land the product per acre in seed-cotton is 1,600 pounds, 1,545 pounds being required for a 475-pound bale, the rating being strict good middling. Sunflower and cocklebur are the most troublesome weeds. No land lies "turned out".

The *black rolling or upland prairie lands* cover about nine-tenths of this region, and extend beyond the limits of the county. The soil of these lands is from 2 to 20 feet thick, and is underlaid by soft white limestone at different depths. It is easily cultivated in dry seasons, and is late, warm, well drained, and best adapted to wheat and oats, cotton forming one-twentieth of the crops and growing to a height of 3 feet, at which it is most productive. The yield of this soil per acre in seed-cotton is from 800 to 1,600 pounds, the rating being middling; 1,565 pounds are necessary for a 475-pound bale of lint. There is no change in the above after many years cultivation.

Cotton forms about 50 per cent. of the crops grown on the *hog-wallow lands*, which cover about 6 per cent. of this section, and have a growth of mesquite. The soil is a black adobe, 1 foot in depth, with a clay subsoil. It is very difficult to cultivate, and is late, cold, and badly drained. Cotton and corn seem best adapted to it, the former growing to a height of 3 feet, and running to weed in wet seasons. The soil produces 500 pounds of seed-cotton per acre, 1,565 pounds being required for a 475-pound bale of lint. Cultivated lands, even after 10 years, show no appreciable difference either in the yield or in the rating, which is middling. Sunflower and cocklebur are the most troublesome weeds.

The effect of frost on the uplands or on the lowlands is just about the same. The bottom lands are the best for cotton, notwithstanding that the cotton-worm generally attacks the lowlands about two weeks before it does the prairie lands.

Shipments are made all through the season, by wagon, to Waco at 50 cents, and thence to Galveston at \$4 per bale.

LIMESTONE.

(See "Oak, hickory, and pine region".)

FALLS.

Population: 16,240.—White, 9,565; colored, 6,675.

Area: 780 square miles.—Woodland, a large part; oak, hickory, and pine region, 60 square miles; central black prairie region, 400 square miles; brown loam prairie, 260 square miles.

Tilled lands: 114,867 acres.—Area planted in cotton, 39,669 acres; in corn, 29,943 acres; in oats, 1,200 acres; in wheat, 953 acres.

Cotton production: 12,495 bales; average cotton product per acre, 0.32 bale, 480 pounds seed-cotton, or 160 pounds cotton lint.

Falls county is divided into two parts by the Brazos river, which flows through it from northwest to southeast. The western division, locally known as "West Falls", is mostly a rolling prairie country with black waxy soils, except on the southwest corner, where the lands are sandy and have a growth of mesquite and a few scattering post-oak trees. Immediately adjoining the bottom lands of the Brazos there is a strip of timbered uplands, 3 or 4 miles wide, having a somewhat sandy soil and a heavy growth of post and Spanish oaks, elm, ash, pecan, and cedar. Some of the best cedar brakes in the county are on this side of the river.

The Brazos bottom lands are of the reddish clayey loam character peculiar to those rivers whose sources are in the extreme northwest. They are wide, very heavily timbered with cottonwood, walnut, pecan, elm, etc., and are highly prized for their great productiveness.

That part of the county east of the river is known as the Blue Ridge, from a low ridge of that name 10 miles east of Marlin, the county-seat. The upper portion of this section is mostly a rolling and open prairie, with black waxy soils and outcropping rotten limestone (Cretaceous), the rest being generally sandy and timbered with mesquite and post oak. (See analysis, page 36.) Eastward from the river lands to Marlin there is but little timber, the country with its red clayey soils being known as "weed prairies". From Marlin eastward to Big Sandy creek, 3 miles distant, the soil is sandy and well timbered; thence to the Blue Ridge the soil is of the black clayey character, with a growth of mesquite and some post oak and an occasional prairie. Big creek, 7 miles east of Marlin, has a rich black bottom land about 2 miles in width, part of which is a mesquite prairie. The Blue Ridge lies between this creek and the Little Brazos, and is not more than 50 feet high, but is a prominent object in these almost level lands. The west side is very abrupt in places, but in others is a gradual slope. The eastern side has a very gradual slope to the Little Brazos. This stream has very little bottom lands until near the southern boundary-line of the county, but is usually well timbered with elm, ash, post, and burr oaks, and some cedar.

Falls is principally an agricultural county, its cultivated lands averaging 147.3 acres per square mile. It is also one of the chief cotton counties of the state, there being but fourteen counties having each a greater cotton acreage, and but nine whose average acreage per square mile is greater (50.9). Its rank is 20 as regards the number of bales produced. Its yield per acre is small in comparison with other counties, there being 89 having a higher product.

ABSTRACTS FROM THE REPORTS OF P. LEA, OF WEST FALLS; A. E. WATSON, OF MARLIN; AND E. C. M'CULLOUGH OF MORESVILLE.

The lands of the county under cultivation in cotton are the alluvial of the Brazos river, the black waxy prairies, sandy prairies, and post-oak uplands.

Of the various qualities of land in the county, the *red clay soils* of the Brazos bottom are the most productive, but comprise only about one-twentieth of the tillable area. Its growth is hackberry, pecan, hickory, elm, and cottonwood. The soil has a depth of many feet, and is easily tilled in all seasons. The chief products are corn and cotton, but it seems to be best adapted to the latter, yielding from 1,500 to 2,000 pounds of seed-cotton per acre. From one-half to two-thirds of the cultivated lands is planted in cotton. The stalk grows to a height of from 5 to 10 feet, and is most productive at 6 feet; from 1,425 to 1,660 pounds of seed-cotton make 475 pounds of lint, which rates very high in the market. The cocklebur and careless weed are most troublesome.

The *black waxy prairie lands*, which comprise about two-thirds of the lands of the county, are well drained, and are almost equal to the Brazos bottoms, producing an average of 1,200 pounds of seed-cotton per acre. The rotten limestone underlies it at 20 feet, though often coming nearer the surface. The soil is a black tenacious clay from 2 to 6 feet deep. The yellow subsoil is often mixed with lumps of the decomposed rock, and is underlaid by joint clay. Corn, cotton, wheat, and oats all do well on these prairies. Cotton comprises one-fourth of the crops, grows to a height of 3½ feet, producing a grade of lint rating as low middling, 475 pounds being obtained from 1,660 pounds of seed-cotton. Long cultivation affects the productiveness very little, if at all.

The *post-oak and black-jack upland* along the river bottom has a gray sandy soil 18 inches deep and a clay subsoil containing water-worn pebbles. The soil is easily cultivated, early, warm, and well drained, and best adapted to cotton and corn. The former grows to a height of 2 feet, and produces, when the land is fresh, about 1,000 pounds of seed-cotton per acre, 1,660 pounds making 475 pounds of lint, which rates as "good ordinary". After eight years' cultivation the yield decreases to 600 pounds of seed-cotton per acre, and 1,730 pounds are required to make 475 pounds of lint. Crab-grass is most troublesome. These uplands wash readily, doing serious damage, but do not injure the black land of the valleys.

The *sandy prairies* of the eastern part of the county have a fine sandy soil 18 inches in depth, and are underlaid by a red clay. They have a scattering growth of elm, oak, and mesquite, are early, warm, and well drained, and are best adapted to cotton, which grows to a height of 2 feet and produces 1,000 pounds of seed-cotton, which rates as good ordinary. After ten years' cultivation the yield is only 800 pounds. Crab-grass is the most troublesome.

Shipments are made by railroad, from October to February, to Marlin and Galveston, the rates being from \$4 to \$5 per bale.

BELL.

Population: 20,518.—White, 18,783; colored, 1,735.

Area: 1,000 square miles.—Woodland, very little; all central black prairie.

Tilled lands: 129,039 acres.—Area planted in cotton, 37,826 acres; in corn, 40,475 acres; in oats, 5,169 acres; in wheat, 10,923 acres.

Cotton production: 9,217 bales; average cotton product per acre, 0.24 bale, 360 pounds seed-cotton, or 120 pounds cotton lint.

Bell, one of the central counties of the state, is high and rolling, and mostly an open prairie, with timbered lands along its water-courses. It is well watered by Leon river and Lampasas creek and their tributaries, which unite to form Little river, a tributary of the Brazos. These streams have some large bodies of rich alluvial lands from one-half to one mile in width, and they are mostly in cultivation where above overflow. They have a large growth of cottonwood, oaks, walnut, mulberry, ash, elm, etc. On the low uplands, near the bottoms, are cedar brakes and live oaks. The prairies are rolling, with outcropping rotten limestone on the hills and deep, black, calcareous soils in the valleys. They yield about 800 pounds of seed-cotton per acre. The cultivated lands average 129 acres per square mile. Corn is the chief crop of the county, though there is not a very great difference between its acreage and that of cotton, whose average is 37.8 acres per square mile. The population is very sparse, being about 20 persons per square mile.

ABSTRACT FROM THE REPORTS OF A. J. HARRIS, OF BELTON, AND MORITZ MAEDGEN, OF TROY.

The western part of the county is hilly, with some table-lands and valleys of black prairie. The eastern, southern, and northern portion is a solid body of rich land, one-fourth of it creek and river valleys of alluvial and sandy loam, the rest of rolling black prairie. On the hills the limestone outcrops in abundance, but the lowlands have a deep soil. The latter are properly the first and second bottoms of the creeks, although mostly open prairie, and are high and dry and never overflow.

Cotton is cultivated on all of these lands, the chief soil being the *black prairie*. The rainfall in the summer season, from July to September, is generally insufficient, but there is no other obstacle to the production of cotton in this county. The prairies are bare of timber, with occasional spots of hackberry, elm, and pecan. The soil has a depth of about 3 feet, and is underlaid by a joint clay, nearly white, and slightly yellowish. Occasionally a small area, having the disintegrated rotten limestone for its subsoil, forms a gray soil by cultivation. The soil is easily cultivated in dry weather, but in wet weather is so sticky as to be almost unmanageable. It remains cold longer in the spring than sandy lands, retarding the growth of cotton, and making it more liable to injury from the summer's drought. The soil is well drained by its natural slopes. The chief crops are cotton, corn, wheat, and oats, and the soil is equally well adapted to all. The proportion of cotton planted is from one-fourth to one-fifth; it grows to a height of from 3 to 5 feet, and the higher the stalk the more productive it is, yielding from 800 to 1,000 pounds of seed-cotton per acre, which, after twenty years' cultivation, is not diminished. About 1,425 pounds of seed-cotton make 475 pounds of lint, the quality being the same from old and from fresh lands, and rating as middling. The most troublesome weeds are the careless, bull-nettle, and bur, and dewberry vines. The soil does not wash, nor is any "turned out". Along the streams the growth consists of cottonwood, burr oak, elm, walnut, hickory, white oak, mulberry, bois d'arc, ash, post oak, black-jack, and sycamore. Near the streams are live and Spanish oaks and cedars. These lands are from one-half to a mile wide, and are very productive.

ABSTRACT FROM THE REPORT OF JOHN T. DULANY, OF BELTON.

The chief cotton land has a *black prairie soil* from 1 inch to 10 inches in depth, with an occasional growth of pecan, hackberry, and live oak. Elm and pecan grow on the creek and river bottoms. The soil is underlaid by soft rock and joint clay, and can be easily cultivated in all seasons. The soil is early, warm, and well drained, and produces cotton, corn, oats, and barley; wheat does not make a profitable crop. About one-third of the crops is cotton, which, when seasonable, reaches a height of from 3 to 5 feet, and inclines to run to weed in continued wet weather; no remedy has been applied. The yield is from 1,000 to 1,500 pounds of seed-cotton per acre, from 1,545 to 1,720 pounds being necessary for 475 pounds of lint. There is no perceptible difference between the yield nor the rating of the staple from fresh land or from cultivated land, it being classed as middling. The careless, bull-nettle, and the cocklebur are the troublesome weeds.

Shipments are made in October and November, by mule wagons, to Taylor station, on the International and Great Northern railroad, and thence to Galveston, the rates being \$1 to Taylor and from \$4 25 to \$4 50 to Galveston per bale.

MILAM.

"See (Oak, hickory, and pine region)."

WILLIAMSON.

Population: 15,155.—White, 13,520; colored, 1,635.

Area: 1,100 square miles.—Woodland, a large part; part central prairie region; rest northwestern red-loam region.

Tilled lands: 141,862 acres.—Area planted in cotton, 18,528 acres; in corn, 25,225 acres; in oats, 8,634 acres; in wheat, 7,901 acres.

Cotton production: 4,217 bales; average cotton product per acre, 0.23 bale, 345 pounds seed-cotton, or 115 pounds cotton lint.

Williamson is largely a prairie county, especially that part lying east of Georgetown, the county-seat. On the west of this town, and extending to Liberty Hill, not far from the county-line, there is a high and hilly belt of country, very broken, and covered with a growth of post and black-jack oaks and a reddish sandy soil. Its surface is covered with a limestone, inclosing nodules and masses of variegated and flinty material; on weathering, this rock presents a rough and jagged surface. At the foot of these hills, on the east, is found the white and soft rotten limestone of the Cretaceous, having an easterly dip and containing the fossils of the formation. This latter limestone underlies the country eastward to the county-line, where the Tertiary sands and clays are found. The prairies on the west of the hills are much more broken, and occur in smaller bodies than those of the east, but the lands are nearly the same. Near the timbers the usual change takes place from the black waxy to the black sandy. The cultivated lands of the county comprise 20.2 per cent. of its area, averaging 129 acres per square mile. Of these, 16.8 acres are in cotton.

ABSTRACT FROM THE REPORTS OF ANDREW J. NELSON, OF ROUND ROCK, AND R. E. TALBOT, OF GEORGETOWN.

The chief agricultural lands are the black waxy prairies, covering about one-half of the county. The bottom lands have a growth of Spanish, burr, post, and white oaks, elm, walnut, pecan, hackberry, willow, sycamore, mulberry, cedar, and cottonwood.

The *prairie soil* is a black stiff clay, from 2 to 5 feet in depth, with a subsoil of yellow clay, containing some "black gravel" and white gravel pebbles, and is underlaid by limestone at 15 feet. It is easy to till in dry seasons, but difficult in wet, and is early, warm, and well drained. The productions, with their average yields per acre, are: Cotton, 800 pounds of seed-cotton; corn, 40 bushels; wheat, 12 bushels; oats, 60 bushels; also, barley and rye. Cotton and corn seem best adapted to the soil, the former constituting one-third of the crops, the height usually attained by it being from 3 to 4 feet; the latter is the most productive. In wet weather there seems to be an inclination to run to weed, which can be restrained by topping. From 1,425 to 1,545 pounds of seed-cotton are required for 475 pounds of lint, the rating being good middling. After twenty years' cultivation there is no appreciable difference in the yield of the land.

Cocklebur, rag-weed, careless, nettle, and sunflower are the most troublesome weeds on this land. The soil of the uplands washes readily on slopes.

Additional abstract of R. E. Talbot.

The *black hog-wallow prairies* comprise one-fourth the area of the county, and having less surface soil than the black prairies, is more subject to drought. It is underlaid by decomposed limestone at 2 feet, and is best adapted to corn and wheat, though one-sixth of the cultivated lands are devoted to cotton. The soil is late, cold, ill-drained, and difficult to till in wet seasons, but better in moderately dry seasons. Cotton grows to a height of 3 feet, yielding 600 pounds of seed-cotton per acre when fresh and after forty years' cultivation. The lint rates as good middling. This soil has the same troublesome weeds as the black waxy.

The sandy loam soils of the *post oak* and *cedar lands* comprise one-fourth of the lands of the county. The former lie in the eastern part of the county, and have an area of 25 by 10 miles; the latter cover the hills on the west with an area of 5 by 30 miles. The soil has a depth of 1 foot. The yellow subsoil is underlaid and mixed with pebbles, gravel, and sand. The soil is best adapted to cotton, corn, and small grain. Cotton grows to a height of 2 or 3 feet, and runs to weed in wet seasons. Deep plowing is the remedy applied to prevent running to weed, and also to favor bolting. The yield per acre in cotton-seed is for fresh lands 500 pounds, which is reduced to 475 pounds after the land has been in cultivation ten years, the lint rating as good middling. The soil washes readily, doing serious damage to the uplands, but not to the valleys. The troublesome weeds are cocklebur, rag- and careless- weeds. In this as in other counties drought seems to be the principal drawback to the successful raising of cotton.

Shipments are made in November and December, by rail, to Houston at \$3 65, and to Galveston at \$4 40 per bale.

BURNET.

(See "Northwestern red-loam region".)

TRAVIS.

Population: 27,028.—White, 18,410; colored, 8,618.

Area: 1,000 square miles.—Woodland, one-eighth; all central black prairie region.

Tilled lands: 86,724 acres.—Area planted in cotton, 29,500 acres; in corn, 30,882 acres; in oats, 4,779 acres; in wheat, 4,048 acres.

Cotton production: 9,271 bales; average cotton product per acre, 0.31 bale, 465 pounds seed-cotton, or 155 pounds cotton lint.

Travis is a rolling prairie county, and is divided by the Colorado river, flowing through it in a southeasterly course. The bottom lands of this stream, as well as of others that water the county, are well timbered with pecan, elm, cottonwood, and hackberry. (See analyses, page 47.) The country west and northwest from Austin is hilly and broken, the summits having a growth of cedar and Spanish oaks; the rest of the county is largely prairie, the monotony being broken only by the timber of the streams or a few scattering oaks and clumps of mesquite. It is estimated that the prairies, with their black clayey lands, cover about five-eighths of the surface of the county. Cretaceous rotten limestone is the prevailing rock, and is found underlying the lands and forming ledges in the hills. The lands of the river bottom are wide, and have a reddish clay loam soil, which, near the uplands, changes to a black clayey character, somewhat similar to that of the prairie. Immediately adjoining the river there are commonly low and narrow flats of a deep sandy soil, subject to overflow, and of little or no value. The rest of the bottom lands are very generally under cultivation.

Tilled lands embrace 13.6 per cent. of the county area, averaging 86.7 acres per square mile. Of these 29.5 acres are in cotton.

ABSTRACT FROM THE REPORTS OF E. H. ROGERS AND SON AND J. J. WHEELLESS, OF AUSTIN.

Although the early-planted cotton in the lowlands is likely to be killed by the late frosts, still, because of their much greater yield, they are preferred to the uplands. This county seldom fails to return a fair crop. The dry weather of this part of the state is preferable to wet, because the latter is favorable to the coming of the grasshopper, a more deadly enemy than the drought. The lands devoted to cotton cultivation comprise the rich black prairie, both along the creek bottoms and also on the uplands, the black sandy lands of the Colorado river, and a light sandy low bottom land.

The *black prairie lands* cover about three-fourths of the tillable area of the county, mesquite, with a few patches of live oak and clumps of chaparral, forming the natural timber growth. The soil is from 2 to 3 feet in depth, is black waxy, and on the very high prairies there are outcroppings of white rotten limestone. Near the foot of the hills, where the deposit is deep, the subsoil is a heavy yellow clay; generally, though, it is limestone. The soil is easy to till in dry seasons, as it is then not tenacious, but in wet weather it is especially difficult. It is early, well drained, and warm, producing cotton, corn, wheat, and oats, but apparently it is best adapted to cotton and corn,

the former comprising from one-half to two-thirds the crops planted. Cotton grows to a height of from 2 to 4, or even 5 feet, at which it seems to be the most productive. In wet seasons, and when too thick, it runs to weed, which can be prevented by topping. It yields from 1,200 to 1,500 pounds of seed-cotton per acre, and 1,485 pounds make a 475-pound bale of lint. Thirty years' cultivation makes no appreciable difference either in the productiveness of the soil or in the character of the staple, unless it be that the fiber is a little shorter. Cocklebur, tie-vines, Spanish bur, and morning-glory are the most troublesome weeds. These seem to be on all lands of the county.

The *Colorado river bottom lands* have a soil of reddish clay loam, with a great deal of sand next to the river. They comprise about one-sixth of the lands of this region, the natural timber growth being pecan, elm, hackberry, box-elder, cedar, cottonwood, and in some places mesquite. The depth of the soil is from 3 to 6 feet, with a subsoil of rocky, gravelly clay, containing drift pebbles, etc., underlaid by fine sand and gravel, the former being found at 12 feet. It is best adapted to cotton and corn, is easily cultivated in all seasons, and is warm, early, and well drained, two-thirds of the tillable lands being devoted to cotton. This grows to a height of from 6 to 8 feet, and yields from 1,600 to 2,000 pounds of seed-cotton per acre, 1,665 pounds of which are necessary for a 475-pound bale. The staple rates from middling to fine from fresh lands, and about the same from lands after ten years' cultivation, except that the staple is not quite so long. Very little land lies "turned out".

The soil of the *light-brown sandy bottom lands* is covered by a timber growth of elm, willow, and cottonwood, and occurs only in places along the water-courses. The soil is 2 feet in depth, with a red-clay subsoil, impervious when undisturbed; contains white pebbles, and is underlaid by sand and gravel at 10 feet. The land is early, warm, well drained, and best adapted to corn and hay. One-fourth of the crops is in cotton, which grows to a height of from 5 to 6 feet; 1,800 pounds is the product per acre of seed-cotton, and from 1,485 to 1,665 pounds make 475 pounds of lint, which rates from middling to fair. In wet weather the plant inclines to run to weed, which may be restrained by topping. After thirty years' cultivation there is no apparent change in the yield. Cocklebur is the most troublesome weed. No land lies "turned out".

The *black bottom sandy land* comprises about one-sixth of the tillable area, and extends the whole length of the river from east to west. Its natural timber growth is elm and hackberry. The soil is a fine black or brown sandy, from 3 to 4 feet deep; the subsoil is heavier, consists of a dark red clay, which bakes hard where exposed to the sun and wind, is very impervious when undisturbed, and contains flinty pebbles, "black gravel," and white gravel. It is underlaid by fine sand and gravel, sand being found at 12 feet. The soil is easily tillable in all seasons, as there is enough sand to prevent sticking; it is early when well drained, and is best adapted to cotton and corn. About one-half the crops planted is in cotton, which usually attains a height of about 4 feet, producing well at that height. The plant inclines to run to weed in wet weather, and topping is the remedy applied. The product per acre of seed-cotton from fresh or from lands that have been under cultivation thirty years is 2,000 pounds, 1,485 pounds being necessary for 475 pounds of lint. Very little land lies "turned out", and this, when again cultivated, produces well. Cocklebur, tie-vine, and sunflower are the most troublesome weeds.

The *light ashy land*, comprising about one-third of the cultivated lands, is in some places sandy and in others quite rocky, and extends in all directions, but less toward the northeast, black soils being there found. The natural timber growth is post and black-jack oaks and mesquite. The soil is fine, sandy, and gravelly, whitish gray in color, and from 6 inches to 1 foot in depth. The subsoil is a red clay, containing small rocks, in some places white gravel, and is underlaid by sand and gravel. The soil is early, warm, and well drained, and easily tilled in all seasons, and is apparently best adapted to cotton and potatoes. About two-thirds of the tillable area is devoted to cotton, which usually grows to a height of 6 feet, in wet seasons higher; 5 feet is the most productive height. On newly cleared land, in wet seasons, there is a tendency to run to weed, which is restrained by topping the plant at 5 feet in July or August. On fresh land the product per acre of seed-cotton is from 1,000 to 1,400 pounds, 1,665 pounds being requisite for 475 pounds of lint, rating from middling to fair. After the land has been under cultivation for ten years the yield is reduced to 600 or 800 pounds of seed-cotton per acre, 1,720 pounds being necessary for 475 pounds of lint, the staple being a little shorter than that from fresh land. Some land lies "turned out", not producing well when again cultivated. The soil washes readily on slopes, doing serious damage, and to some extent injuring the valleys. No efforts have been made to check the damage. Cocklebur and crab-grass are the troublesome weeds, the latter being a great pest on this third-rate land.

Cotton is hauled to Austin, as soon as baled, at the rate of 50 cents per bale, and thence by railroad to Galveston or to New Orleans, freight being about \$6 per bale.

CALDWELL.

Population : 11,757.—White, 7,723; colored, 4,034.

Area : 540 square miles.—Woodland, greater part; oak, hickory, and pine region, 400 square miles; central black prairie region, 140 square miles.

Tilled lands : 54,914 acres.—Area planted in cotton, 18,906 acres; in corn, 18,393 acres; in oats, 1,364 acres; in wheat, 2,566 acres.

Cotton production : 7,609 bales; average cotton product per acre, 0.40 bale, 600 pounds seed-cotton, or 200 pounds cotton lint.

Caldwell, one of the southeastern border counties of the central region, though having a large proportion of open prairies, is well timbered with post oak, hickory, etc. Its surface is undulating and well watered by numerous creeks. The northern and western part of the county is of the black waxy prairie character of the central region, while the rest is partly dark sandy prairie and partly oak and hickory sandy uplands. The rocks of the county are limestones of the Cretaceous on the west, and red ferruginous sandstone of the Tertiary hills near Luling and northward. In Williamson's prairie, south of Lockhart, the county-seat, there have been found an abundance of well-preserved Tertiary Eocene fossils.

The prairies vary in breadth from 6 to 30 miles, and are interspersed with streams having a timber growth of live oak, elm, ash, hickory, and cottonwood. Lockhart is situated in a grove of live oaks, which are festooned with long moss (*Tillandsia usneoides*), and an open prairie stretches away immediately on the west and south. The town is supplied with water from the Lockhart springs, 20 in number.

Caldwell is an agricultural county, the lands under cultivation comprising 15.9 per cent. of its area, an average of 101.7 acres per square mile. Cotton is a prominent crop, with an average of 35 acres per square mile and a yield per acre greater than that for the state. The prairies are largely devoted to stock grazing.

ABSTRACT FROM THE REPORT OF JOHN B. HOLT, OF LOCKHART.

The uplands of the county are rolling and level, comprising hog-wallow prairies and timbered sandy loams, and some of the prairies, though black, are rocky and covered with a growth of mesquite.

The lands devoted to the cultivation of cotton comprise black sandy loam, light post-oak sandy, and black waxy prairie. The soil best adapted to cotton is the *black sandy loam*, although the black prairie stands the drought well and a good yield is obtained from it, but it is hard to get a stand on it. The black sandy loam comprises one-quarter, the light post-oak sandy one-quarter, and the black waxy one-half of the county. The first two occur only in spots.

The natural timber of the light post-oak sandy lands is pecan, elm, hickory, and post, and black-jack oaks; it is underlaid by a subsoil of red clay. The black waxy is from 2 to 6 feet in depth; the subsoil is mainly concrete, though in some cases it is joint clay, and is underlaid by rock at from 4 to 20 feet. The soil is not easily tillable in dry seasons, and is early and well drained.

The chief crops of the county are cotton, corn, and some wheat. Cotton forms one-half of the total crops, the height usually obtained being from 4 to 5 feet; in wet weather there is an inclination to run to weed, but this is restrained to some extent by topping, which also favors bolling. The product per acre of seed-cotton, when the land is fresh, is 1,000 pounds, 1,780 pounds being necessary for a 475-pound bale; when clean the staple rates as good, ordinary and middling. After four years' cultivation the product per acre is from 1,200 pounds to 1,500 pounds. The most troublesome weeds are tie-vines, cockleburrs, and sunflowers. The black waxy soil does not wash readily; the sandy does, and sometimes the damage by such washings is quite serious.

The shipments are made chiefly from September to January by means of wagons and railroads to Galveston, Houston, and New York, the rates ranging from \$3 75 to \$5 per bale.

HAYES.

Population: 7,555.—White, 6,076; colored, 1,479.

Area: 680 square miles.—Woodland, very little; all central black prairie.

Tilled lands: 32,711 acres.—Area planted in cotton, 9,868 acres; in corn, 10,749 acres; in oats, 2,223 acres; in wheat, 2,789 acres.

Cotton production: 3,441 bales; average cotton product per acre, 0.35 bale, 525 pounds seed-cotton, or 175 pounds cotton lint.

Hayes is a prairie county, but its surface is undulating and somewhat rolling on the east, and hilly and mountainous on the west, where there is an abundant growth of Spanish and live oaks, cedar, elm, mesquite, etc. It is watered by the San Marcos river and numerous small tributary streams, all flowing southeastward. There are a number of excellent springs in various localities. The lands of the county are the black, waxy soil of the prairies and the sandy soils of the narrow skirts of timbers, underlaid by Cretaceous rotten limestones. Lands under cultivation average 48.1 acres per square mile, and the crops of the county are corn, cotton, small grain, and fruits. The soils are very productive, yielding from 500 to 1,000 pounds of seed-cotton per acre. The prairies are largely devoted to stock grazing. Corn is, however, the chief crop, its acreage being much greater than that of cotton. The latter has an average of 14.5 acres per square mile, which is 30.2 per cent. of the lands under cultivation. The county is sparsely settled, with an average of about eleven persons per square mile.

Shipments of cotton are made either to Austin on the north, or to the railroad stations on the south, the county lying about midway between the two points.

BLANCO.

Population: 3,583.—White, 3,415; colored, 168.

Area: 710 square miles.—Woodland, some; central black prairie region, 580 square miles; northwestern red loam, 130 square miles.

Tilled lands: 16,090 acres.—Area planted in cotton, 3,039 acres; in corn, 5,382 acres; in oats, 597 acres; in wheat, 2,106 acres.

Cotton production: 690 bales; average cotton product per acre, 0.23 bale, 345 pounds seed-cotton, or 115 pounds cotton lint.

Blanco is a hilly and broken prairie county, and is chiefly devoted to stock raising. It is watered by the Perdarnales river and tributaries. The lands of the county are almost entirely of the black, waxy character common to the central prairie region.

The timber growth of the county is post and live oaks, pecan, some hickory, etc. The county is sparsely settled, with an average of five persons per square mile. The lands under cultivation embrace but 3.5 per cent. of the county area, an average of 22.7 acres per square mile. Of the latter, 4.3 acres are devoted to the culture of cotton.

ABSTRACT FROM THE REPORT OF JOHN W. SPEER, OF BLANCO.

There are two classes of lands employed in the cultivation of cotton, namely, the black stiff prairie and the sandy creek lands, with a sandy or gravelly subsoil. The chief soil is the *black waxy prairie*, which forms nine-tenths of the county, and extends 20 miles northward, 50 miles in a southerly direction, and about 150 miles to the west. The natural growth of the timbered portion is post, Spanish, black-jack, and shin oaks, cedar, pecan, elm, and cottonwood. The soil is a black, heavy clay loam 2 feet in depth, the subsoil being mostly red clay, underlaid by rock at from 4 to 6 feet. It is a warm, early, well drained, and in dry seasons easily tillable soil.

The chief crops of the county are corn, wheat, oats, cotton, sorghum, and grasses. Summer droughts do more harm to the crops than anything else. Cotton and wheat are best adapted to the soil, the former amounting to one-third of the crops. The height usually attained by cotton is from 2 to 8 feet, the most productive height being about 3½ feet. When the season is wet and the cotton late there is a tendency to run to weed. There is but little, if any, difference between the yield of fresh land and that which has been under cultivation twenty years, the product per acre in seed-cotton being from 1,500 to 1,800 pounds, 1,780 pounds of which are necessary to make a 475-pound bale of lint. The rating is middling to good middling, either for fresh land or for that from land which has been under cultivation for twenty years. The most troublesome weeds are sunflowers and cockleburrs. None of the land lies "turned out", nor does it wash.

November and December are the months in which shipments are usually made, being hauled by wagons to Austin and San Antonio at \$2 per bale.

GILLESPIE.

Population: 5,228.—White, 5,096; colored, 132.

Area: 980 square miles.—Woodland, a little; central black prairie region, 620 square miles; northwestern red loam, 160 square miles; table-lands, 200 square miles.

Tilled lands: 10,127 acres.—Area planted in cotton, 4,082 acres; in corn, 5,297 acres; in oats, 527 acres; in wheat, 3,533 acres.

Cotton production: 767 bales; average cotton product per acre, 0.19 bale, 285 pounds seed-cotton, or 95 pounds cotton lint.

Gillespie is one of the most western of the cotton counties of the state, and lies west from Austin. The surface of the country is hilly or mountainous, with timbered areas and broad valley lands of open mesquite prairies. The Perdarnales river, with its tributaries, flows in an easterly course through the lower part of the county, while on the north a few small tributaries of the Colorado river flow northeast. Most of the county is included in the dark or black prairie region of the Cretaceous, its limestones forming the hills of the south. On the north are the red sandy soils, sandstones, granites, and other rocks of the western region. The east and west divide between the tributaries of the two rivers mentioned probably marks the line between the two regions. Fredericksburg, the county-seat, is said to be 1,500 feet above the sea.

The population of Gillespie county is almost exclusively German, and averages 5.3 persons per square mile. The lands under cultivation comprise about 1.6 per cent. of the county area, averaging 10.3 acres per square mile, of which 4.2 is devoted to cotton culture. Corn is the chief crop, cotton and wheat ranking next. Their respective yields were very small for the year 1879, the average of seed-cotton being but 285 pounds.

ABSTRACTS FROM THE REPORTS OF THOMAS B. SPLITTGERBER AND ADOLPH WEISS, OF FREDERICKSBURG, AND
B. F. WHITE, OF MARTINSBURG.

The soils devoted to cotton are the black and yellow lowlands, lying on slopes in patches; the dark sandy mesquite prairies; the black sandy loam of Perdarnales river; and the post-oak soils of the southeast.

The *black waxy prairies* are the chief lands of the county, covering two-thirds of its area, and have a scattering growth of post and live oaks and mesquite. They occur along the limestone hills and mountains, and in the valleys between them. The soil is a black waxy clay from 1 foot to 4 feet deep, and is underlaid by heavy red clay, which is very difficult to till in wet weather, but very easy in dry. The chief crops are cotton, corn, wheat, rye, oats, sweet and Irish potatoes. Cotton comprises one-third of the crops, and grows to a height of from 3 to 4 feet, yielding from 800 to 1,000 pounds of seed-cotton, 1,485 pounds being required for a 475-pound bale of lint. After five years' cultivation the soil improves, and yields from 1,000 to 1,500 pounds of seed-cotton, with no change in other respects. Careless and purslane weeds are the most troublesome.

The *post-oak uplands* extend from west to east about 20 miles and from north to south about 25 miles, and have a growth of post and black-jack oaks and hickory. The soil is a black or yellowish fine sandy loam 18 inches in depth, with a subsoil of orange-red loam, which becomes like the soil by cultivation. It is underlaid by sand-rock at a depth of from 12 to 15 feet. The soil is easily tilled in wet as well as in dry seasons, is early, warm, and well drained, and produces wheat, cotton, potatoes, and sorghum. About one-third of the crops is of cotton, which grows to a height of about 3½ feet, producing 800 pounds of seed-cotton when fresh. A few years' cultivation improves the land, the yield increasing to 1,000 pounds. From fresh land 1,545 pounds of seed-cotton are required for a 475-pound bale of lint, but otherwise only 1,425 pounds. Crab-grass and worm-weed are the most troublesome weeds.

The *dark mesquite prairies* comprise about one-third of the lands of the county, and extend from west to east about 20 miles and from north to south about 18 miles. They have a natural timber growth of live and Spanish oaks and mesquite. The soil is a light, fine, sandy loam, black in color, and 3 feet in depth. The subsoil is a tough yellow clay, which bakes very hard where exposed, but becomes like the soil by cultivation. It is quite impervious when undisturbed, contains hard-rounded pebbles, and is underlaid by lime-rock at from 5 to 10 feet. The soil is rather difficult to till in wet seasons, but usually not troublesome. It is early when well drained, and apparently is best adapted to cotton, corn, potatoes, and sorghum. Cotton forms about one-third of the crops here, and usually is most productive at a height of 3 feet. The cotton-plant has never been known to run to weed here. The seed-cotton product per acre is about 700 pounds on fresh land, 1,545 pounds being necessary to make a 475-pound bale of lint. The seed-cotton product per acre, after three years' cultivation, is 900 pounds, and 1,425 pounds then make a 475-pound bale of lint, which rates about the same as that from fresh land. The most troublesome weeds are sunflower, cocklebur, and crab-grass. None of these lands lie "turned out".

The *black loam soils* of Perdarnales river and small patches on the mountains cover about one-third of the county, and are scattered about in areas varying from 50 to 5,000 acres. The natural growth is pecan, elm, and hackberry. The soil is a black heavy clay loam, from 8 to 10 feet deep, with a tough yellowish black clay subsoil, which bakes very hard where exposed, but gradually becomes like the surface soil. It is quite impervious when undisturbed, and contains hard white gravel, and sometimes large pebbles inclosing sea shells; it is underlaid by rather hard sandy rock at from 5 to 15 feet. The soil is very difficult to till in wet seasons, is late and well drained, and is best adapted to corn and sorghum. About one-fifth of these lands is devoted to cotton, which usually grows to a height of about 2½ feet, and is most productive at that height. Cotton has never been known to run to weed on these lands. The seed-cotton product per acre of fresh land is 600 pounds, and 1,545 pounds are required for a 475-pound bale of lint. After three years' cultivation the yield is increased to 800 pounds, then 1,425 pounds are necessary for a 475-pound bale of lint, which rates the same as that from fresh land. The most troublesome weeds are sunflower and cocklebur. No land lies "turned out".

The *post-oak lands* in the southeast have a fine sandy soil from 6 to 8 inches in depth of a brown to red color; its subsoil is a red loam, containing flint pebbles. It produces cotton, corn, wheat, and oats, is early, warm, and well drained, and easily tillable in either wet or dry seasons.

The lowlands are preferred, because the cotton grows faster, although it is later, and is liable to be killed by early frosts. It is said to grow well, and with ordinary care a full crop is assured. The fiber is of a superior quality, and commands the highest price in the market. Drought is the only hinderance to cotton growing, and that is becoming less frequent than formerly.

Shipments are made from September to January, by wagon, to Austin or San Antonio, the rate being \$2 50 per bale.

KERR.

Population : 2,168.—White, 2,075; colored, 93.

Area : 1,100 square miles.—Woodland, a little; all central black prairie.

Tilled lands : 9,481 acres.—Area planted in cotton, 469 acres; in corn, 1,348 acres; in oats, 185 acres; in wheat, 1,134 acres.

Cotton production : 72 bales; average cotton product per acre, 0.15 bale, 225 pounds seed-cotton, or 75 pounds cotton lint.

Kerr is one of the extreme western organized counties in the central region. It has a very small population, averaging about two persons per square mile. The surface of the country is hilly and broken, and watered by the headwaters of the Guadalupe river. The valley of this river is said to be from 1 to 3 miles wide, and is covered in places with timber, while in others the prairie extends for miles. Like the adjoining counties, Kerr is largely devoted to stock raising, and but 1.3 per cent. of the area is under cultivation, averaging 8.6 acres per square mile. The people give but little attention to the culture of cotton. The proportion of tilled lands given to this crop was, in 1879, only about 4.9 per cent., or four-tenths of an acre per square mile. The first crop was planted in 1870.

ABSTRACT FROM THE REPORT OF W. P. COLEMAN, OF KERRVILLE.

The surface of the county is hilly, but the valley lands are level between the hills and the river. Some of the lands are timbered, and some are not. The lands devoted to cotton culture lie in patches along the river and creeks, the same kind never extending to any great distance. There are three kinds, namely, the black valley, the clay loam, and the gray valley soil.

The chief soil is the *black valley land*, which covers about two-thirds of the county, the natural growth being live, Spanish, and post oaks. The soil is a heavy black clay loam, 18 inches deep, with a subsoil of red or yellowish clay, underlaid by gravel at 4 or 5 feet. It is an early, warm, and well-drained soil, in wet seasons difficult and in dry seasons easily cultivated. The chief crops of the county are cotton, wheat, oats, and rye. Cotton and corn do very well, but oats are best adapted to the soil. Between one-third and one-fourth of the crops consist of cotton, which usually attains a height of from 3 to 4 feet, at which it is most productive, running to weed only in very wet seasons. Topping is the remedy applied. The yield per acre of seed-cotton is altogether dependent on the season, varying all the way from 400 to 1,500 pounds, 1,545 pounds being the necessary amount for a 475-pound bale of lint. The rating is from middling to good middling. After the land has been in cultivation ten years the yield is from 600 to 1,500 pounds of seed-cotton per acre, being, as in case of fresh land, dependent on the season, 1,485 pounds being necessary for a 475-pound bale. The rating is generally improved the longer the land is cultivated. The most troublesome weeds in this, as well as in the other two soils, are the sunflower and careless-weed. No land lies "turned out"; this also applies to the other two soils. There is very little washing of the soil.

The *post-oak land* comprises but a small part of the county, and extends only for short distances. The soil is a heavy blackish clay loam, 18 inches deep, early, warm, well drained, rather difficult to till in wet but not usually very troublesome in dry seasons. The subsoil is a reddish clay, containing some flinty, angular stones of considerable size, and underlaid by sand at 4 or 5 feet. Nearly one-fourth of the crops consist of cotton, which reaches the height of from 4 to 5 feet, 4 feet being the most productive height. There is only a very slight difference between the yield of fresh land and that which has been under cultivation ten years, the product being from 1,000 to 1,500 pounds per acre. The rating in both the above cases is good middling.

The *gray valley lands* cover about one-fourth of the county, occurring generally in small patches. When it extends for any distance, it is only up and down the river and creeks. There is very little natural timber on these lands—some live-oak trees and bushes. The soil is a light gray silt from 15 to 16 inches deep, early, warm, well drained, and easy to till in either wet or dry seasons. The subsoil is yellowish clay, underlaid by gravel, which sometimes is found near the surface. Cotton comprises about one-third of the crops. The height attained is from 3 to 4 feet, either of which is equally good for production. The soil yields 1,300 pounds of seed-cotton per acre both when fresh and after seven years' cultivation, 1,485 pounds being necessary for a 475-pound bale of middling lint. Careless-weed is the most troublesome.

Shipments are made by wagon to San Antonio, and thence by rail to Galveston.

KENDALL.

Population : 2,763.—White, 2,588; colored, 175.

Area : 670 square miles.—Woodland, very little; all central black prairie.

Tilled lands : 9,410 acres.—Area planted in cotton, 1,808 acres; in corn, 3,657 acres; in oats, 655 acres; in wheat, 1,167 acres.

Cotton production : 286 bales; average cotton product per acre, 0.16 bale, 240 pounds seed-cotton, or 80 pounds cotton lint.

Kendall is a hilly and broken county, well watered by the Guadalupe river and tributaries and Cibolo creek. It is largely a prairie country, with a black-loam soil, but the tillable lands are in small bodies. There is an abundant supply of timber, consisting of live, post, white, and black-jack oaks, cedar, elm, walnut, and a variety of wild apple, plum, cherry, etc. The timbered lands are said to cover two-thirds of the county. While this is an excellent stock country, it is also largely devoted to agriculture, the crops being cotton, corn, wheat, oats, and potatoes. Corn is the chief crop. The low average yield per acre of seed-cotton, as shown by the census returns for 1879, is perhaps due to the extreme drought of that season. Other crops of that year were almost failures. Lands under cultivation comprise 2.2 per cent. of the county area, an average of 14 acres per square mile. Of the latter 2.7 acres are devoted to the culture of cotton.

ABSTRACT FROM THE REPORT OF C. H. CLAUSSE, OF BOERNE.

Kendall county is situated in the mountainous part of western Texas. The area of tillable lands is smaller than that of the pasture lands of the mountains, and therefore the farms are small, containing not more than 40 or 50 acres.

The lands devoted to the cultivation of cotton are the strong black post oak, mixed sometimes with flinty pebbles and reddish clay, the black prairie, and a light sandy river bottom soil.

The *strong black post oak soil*, the one best adapted to cotton, has been under cultivation for fifteen years, and still yields as good a crop as ever. The cotton stalk reaches a height of 4 feet, and yields 1,900 pounds of seed-cotton per acre, making one-third of its weight of clean lint.

The *black prairie soil* is well adapted to cotton, which grows 3 feet high and yields 1,500 pounds of seed-cotton per acre. Manuring is necessary after a cultivation of seven or eight years.

The *light sandy river bottoms* produce a low stalk, not more than 12 or 18 inches high, but when manured it will yield as much as the black prairie lands.

Cotton culture is in this county being constantly increased, the crop withstanding the dry seasons being better than other crops. The planters cultivate only what they are able to attend to themselves without hired help, and therefore the staple and quality are much better.

Cotton is shipped to Mexico and Galveston, and some to San Antonio.

COMAL.

Population: 5,546.—White, 5,276; colored, 270.

Area: 670 square miles.—Woodland, very little; all central black prairie.

Tilled lands: 33,414 acres.—Area planted in cotton, 5,860 acres; in corn, 8,990 acres; in oats, 861 acres; in wheat, 2,898 acres.

Cotton production: 2,102 bales; average cotton product per acre, 0.36 bale, 540 pounds seed-cotton, or 180 pounds cotton lint.

The county of Comal, situated in the southern part of the central prairie region, is rolling and hilly in character, the largest part of its surface being an open mesquite prairie, with black waxy and black sandy soils. The hills, or mountains, as they are called, because of their prominence, with their elevations of 300 feet, are too rough and rocky for tillage.

The streams are timbered with black and post oaks, walnut, hickory, pecan, elm, etc. The Comal river is said to have a fall of 40 feet in a distance of 3 miles, furnishing good water-power, which is partially utilized. The Guadalupe river is the principal stream of the county, flowing through it in a southeast course.

Among the crops of the county fruits of many kinds are said to be largely and successfully cultivated. The population is largely German, especially in and near the town of New Braunfels, the county-seat. The county is not thickly settled, the average per square mile being but 8.3 persons. Nearly 8 per cent. of the county area is under cultivation, averaging 49.9 acres per square mile. Corn is the chief crop, though cotton, with its average of 8.7 acres per square mile, is a prominent product. Much attention is given to stock raising.

ABSTRACT FROM THE REPORT OF R. WIPPRECHT, OF NEW BRAUNFELS.

About two-thirds of this county is a rolling, black waxy prairie, and the remainder mountainous and hilly, rising at once 300 feet above the prairie. The growth on the prairies is mesquite, and along the streams live and post oaks, elm, hackberry, and pecan.

The *prairies* are the chief cotton lands, with a black clay soil from 5 to 25 feet in depth, having a subsoil which in some places is a yellow clay with strata of gravel, and in others a yellow-grayish loam, impervious (and hence used for cisterns), and underlaid by a kind of blue impervious clay of unknown thickness. The land is very difficult to till in wet seasons, and in dry seasons good teams are required. It is early and ill drained, and produces crops of corn, cotton, wheat, oats, sweet potatoes, and sorghum. Cotton comprises one-third of the crops, and grows to a height of 5 feet, producing 1,200 pounds of seed-cotton per acre, 2,020 pounds being required for a 475-pound bale of lint, which rates as good middling. Ten years' cultivation reduces the yield to one-fourth less than that on fresh land, and requires 1,185 pounds for a 475-pound bale of middling lint. The morning-glory (*Convolvulus*) vine is most troublesome on these prairie lands. The soil washes readily on slopes, but the damage is not serious.

The *hilly uplands* are covered with a growth of cedar, live and post oaks, black-jack, pecan, elm, walnut, cypress, and mesquite. The soil is a gravelly loam, brown to black in color, and in places has an abundance of fossil shells. It is about 3 feet deep, and is underlaid by a subsoil of gravel and clay, or by rotten limestone. Cotton grows to a height of 4 feet, yielding about 1,000 pounds of seed-cotton per acre, the lint rating as good middling. After ten years' cultivation the yield is 800 pounds. The soil washes readily, doing serious damage in places, but not to the valleys below.

Shipments are made to Marion station, and thence to Galveston by railroad at \$4 50 per bale.

GUADALUPE.

Population: 12,202.—White, 8,747; colored, 3,455.

Area: 710 square miles.—Woodland, about one-half; oak, hickory, and pine region, 380 square miles; central black prairie region, 330 square miles.

Tilled lands: 69,680 acres.—Area planted in cotton, 16,469 acres; in corn, 23,501 acres; in oats, 2,260 acres; in wheat, 4,483 acres.

Cotton production: 6,531 bales; average cotton product per acre, 0.40 bale, 600 pounds seed-cotton, or 200 pounds cotton lint.

Guadalupe, lying in the southern part of the central prairie region, is largely a prairie county, rather rolling, and watered by the Guadalupe river, which flows through it, and by San Marcos river and Cibolo creek, which form its northeast and southwest boundaries.

The northwestern half of the county is covered by the black waxy prairie lands of the central region, on which a mesquite growth is abundant, with occasional motts or clumps of oak. Rotten limestone is the prevailing rock, but its outcrops are not as frequent as in the more hilly counties of the region. The soil is deep and very productive.

Adjoining these prairies on the southeast are others having a black sandy soil, but the belt is narrow and irregular. The extreme southeast part of the county is covered with a growth of mesquite and post oak, and properly belongs to the oak and hickory uplands that extend from the northeast into this section of the state.

Guadalupe is largely an agricultural county, 15.3 per cent. of its area being under cultivation, an average of 98.1 acres per square mile. Cotton is a prominent crop, though not the chief one, its average being 23.2 acres per square mile. The prairies are generally devoted to stock grazing.

COTTON PRODUCTION IN TEXAS.

ABSTRACT FROM THE REPORT OF AUGUST EBERT, OF MARION.

The cotton lands of the county are the black waxy, the sandy, and the bottom soils.

The *black waxy prairies* are considered the chief cotton soils in the county, and extend about 50 miles east of Marion and north and west beyond the county-line. The growth on the prairies is mesquite and scattering post oak, with excellent grasses for grazing purposes. The soil is several feet deep, with beds of gravel and a clay understratum below it. As is usual with these black prairies, the soil is very difficult to cultivate in wet seasons. It is early, warm, and well drained, producing good crops of cotton, corn, wheat, oats, rye, barley, sorghum, and sweet potatoes. One-half of the land under cultivation is in cotton, which grows to a height of 5 feet, yielding about 1,700 pounds of seed-cotton per acre, 1,545 pounds making 475 pounds of lint, which rates as middling fair in market. There seems to be no change in the yield or the quality of the staple after twenty-five years' cultivation. Morning-glory vines and crab-grass are most troublesome.

The *sandy lands*, lying in the southeastern part of the county, have a growth of post oak and mesquite and a fine sandy soil varying in color from gray to brown and red. The soil is easily cultivated both in dry and wet seasons, producing good crops of cotton and all kinds of grain. Cotton grows to a height of 6 feet, producing 1,700 pounds of seed-cotton per acre. Grass burs are the most troublesome weeds. Bottom lands cover a very small area in the county.

Shipments of cotton are made by railroad from Marion station to Galveston at \$4 50 per bale.

BEXAR.

Population: 30,470.—White, 26,603; colored, 3,867.

Area: 1,180 square miles.—Woodland, small part; oak, hickory, and pine region, 140 square miles; central black prairie, 1,040 square miles.

Tilled lands: 54,200 acres.—Area planted in cotton, 4,273 acres; in corn, 14,601 acres; in oats, 2,159 acres; in wheat, 1,597 acres.

Cotton production: 1,543 bales; average cotton product per acre, 0.36 bales, 540 pounds seed-cotton, or 180 pounds cotton lint.

Bexar county, of which San Antonio is the county-seat, is mostly a high and rolling prairie county, and is well watered by the San Antonio river and its tributaries. The prairie lands have a few scattering live-oak trees, and in places a thick growth of mesquite. The bottoms are rich and well timbered with mesquite, elm, hackberry, cottonwood, and pecan.

In the southern part of the county there is a strip of oak uplands with a gray sandy soil and yellow clay subsoil, the chief cotton land of that section. The prairies have usually a black waxy or hog-wallow soil, sandy in some localities, and in the eastern part of the county are underlaid by occasional beds of gravel and pebbles. The prairies cover the largest part of the county, and are almost exclusively devoted to the grazing of herds of cattle. Corn is the chief crop, its acreage being more than three times that of any other.

Previous to the late war there was little or no cotton produced in this county, and even now its acreage is small, averaging only 3.6 acres per square mile. The population is almost entirely concentrated in and around the city of San Antonio.

ABSTRACT FROM THE REPORT OF R. B. EVANS, OF SELMA.

(Northern part of the county.)

The uplands consist of black hog-wallow prairies. Those of the Cibolo and Salado creeks vary, being in patches of from 10 to 1,000 acres, and on the Medina river from 100 to 1,000 acres.

The lands along the creeks are a dark loam soil, timbered with mesquite, elm, hackberry, and pecan; the adjoining prairie valleys are covered with mesquite and a few scattering oaks.

The chief land of this portion of the county is the *upland prairie*, with thin black hog-wallow clayey soils, interspersed with patches of a sandy nature. Live oak occurs in motts on this prairie, and mesquite is abundant. The depth of the soil is 2 feet, which is underlaid by a heavier clay subsoil, which, when exposed, bakes hard, but gradually becomes pulverized, and contains pebbles. The land is difficult to cultivate in wet weather, the chief crops being corn, wheat, oats, cotton, and potatoes. It seems best adapted to oats, as in some instances the yield has amounted to 110 bushels per acre. Cotton forms one-third of the crops, and grows to the height of 4 or 5 feet. The average yield is about 800 pounds of seed-cotton per acre, 1,665 pounds being required for a 475-pound bale. It rates as good ordinary. Sunflower, cockleburs, hog-weed, and crab-grass are the weeds giving the most amount of trouble.

The *sandy uplands* consist of post oak and hickory timbered lands, interspersed with some prairies. They extend about 10 miles east and west, and about 15 miles north and south. The soil is a fine sandy loam, 2 feet in depth, over a heavier subsoil. It is early, warm, well drained, and best adapted to corn, cotton, and sweet potatoes. About one-third of the crops is in cotton. The height usually attained by the plant is between 4 and 5 feet; but when the season is very wet there is a tendency to run to weed, and no remedy is applied to restrain it. The product in seed-cotton per acre from fresh land is from 800 to 1,500 pounds; after four years the yield is diminished to from 500 to 1,200 pounds, depending upon seasons and cultivation. In both cases the amount requisite for 475 pounds of lint is 1,785 pounds. Burs, crab-grass, and careless-weed are the most troublesome weeds. No land lies "turned out". The soil washes on slopes, but the damage is not of a serious nature. The late frosts often kill early planted cotton on the bottom lands, while that of the adjoining uplands would not be at all injured. Previous to the war this was a stock-raising county.

ABSTRACT FROM THE REPORT OF THEO. E. S. TRIP, OF SAN ANTONIO.

(Lands of the southern part of the county.)

The lowlands are more apt to damage the young cotton than the uplands. The soils used consist of three varieties, viz: (1) Gray loamy valley land, lying mostly on the west side of the Medina river. (2) Black loamy valley land, principally on the east side of the Medina river. (3) Gray sandy land on Elm creek and Atascosa river.

The natural growth of the *gray loam*, which is the chief soil devoted to cotton cultivation and comprises one-half of the region, is mesquite and live oak. The depth is 18 inches, and it has a subsoil resembling hard-pan, except in its not being able to hold water, and is underlaid by yellow clay at about 3 feet. The soil, which produces cotton, corn, oats, and wheat, is early, well drained, and easily

tilled in either wet or dry seasons. Very little cotton is raised; the height of the plant is usually 4 feet, yielding about 1,200 pounds of seed-cotton per acre, and requiring 1,600 pounds for a 475-pound bale, and there seems to be no decrease in the yield of the land or in the rating of the staple even after twenty-five years' cultivation. Cocklebur and sunflower form the most troublesome weeds, although all weeds can be kept down by proper cultivation. No land lies "turned out". There have not been any efforts made to check the damage arising from the washings of the soil.

The *black loamy or waxy land* forms about one-fourth of the region, and lies in spots all over the county. It has a natural growth of mesquite and a little live oak. The soil is a black loam, with a subsoil similar to that of the last soil, which is very difficult to cultivate in wet seasons, but is best adapted apparently to corn, cotton, and oats, and is early, warm, and well drained. About one-fifth of the land is devoted to cotton, which attains a height of from 4 to 5 feet, the latter the most desirable. It never runs to weed. The land seems to be inexhaustible, as there appears to be no difference in the yield from fresh or from cultivated land, in both cases it being from 1,200 to 1,400 pounds of seed-cotton per acre, 1,600 pounds being necessary for a 475-pound bale, rating as middling. The remarks made above concerning weeds, etc., apply also to this soil and to the following one.

The *gray sandy lands*, which constitute the larger portion of the tillable lands of this section, have a gray sandy soil, with a natural growth of post oak principally, with some live oak and mesquite brush. The subsoil is yellow clay, with gravel in spots. The soil seems best adapted to cotton (which constitutes about one-half the crop), corn, and sweet potatoes. It is early, warm, and well drained, and tolerably easy to till in wet, but not so easy in dry seasons. Cotton usually attains a height of from 4½ to 5 feet, never runs to weed, and yields from 900 to 1,000 pounds of seed-cotton per acre on fresh and old land, 1,660 pounds being necessary for a 475-pound bale. Rating is good or ordinary.

Cotton is usually sold to merchants or cotton agents at the gin, and then shipped by rail from San Antonio to Houston and Galveston freight being from \$4 10 to \$5 per bale.

MEDINA.

Population: 4,492.—White, 4,209; colored, 283.

Area: 1,300 square miles.—Woodland, a little; mostly central black prairie region.

Tilled lands: 16,987 acres.—Area planted in cotton, 685 acres; in corn, 11,600 acres; in oats, 1,069 acres; in wheat, 1,008 acres.

Cotton production: 289 bales; average cotton product per acre, 0.42 bale, 630 pounds seed-cotton, or 210 pounds cotton lint.

Medina, one of the western counties of the state, is principally a stock-raising section. The surface of the country is hilly and broken, and is largely timbered, a belt of post-oak lands beginning west of Castroville and extending southeastward into the adjoining counties. Black waxy and hog-wallow prairie lands are found in localities.

The county is sparsely settled, with an average of more than three persons and 13.1 acres of tilled land per square mile. Corn is the chief crop of the county, cotton having an acreage of only 4 per cent. of the lands under cultivation, though its average yield is more than that for the state at large.

ABSTRACT FROM THE REPORT OF DR. A. WADGYMAR, OF SAN ANTONIO.

The uplands of the county are hilly, partly black prairie and partly hog-wallow, varying greatly from one ridge to another, being in patches of from 3 to 8 acres each. Sandy, loamy (so-called post oak) black hog-wallow and alluvial river bottom are the kinds of lands employed in cotton cultivation.

The chief soil is the *sandy, loamy post oak*, which averages from 1½ to 2 feet in depth; its subsoil is a tough bluish clay. This soil predominates in the eastern and northern parts of the county, and produces one-third of all the cotton grown. The natural timber growth is post oak and mesquite. The subsoil is underlaid by soft rock at from 4 to 50 feet. The chief crops of the county are corn, tobacco, and cotton. The soil is early when well drained, and is best adapted to corn and cotton. Cotton usually attains a height of from 4 to 5 feet, but is most productive when at 4 feet. The tendency to run to weed is great in rainy seasons, and also is owing to neglect in cultivation. The free use of the plow and the hoe will tend to increase the production of bolls. The product per acre of seed-cotton is from 1,800 to 2,300 pounds on fresh land, or on land after 20 years' cultivation. The soil washes readily on slopes. Sometimes the damage so arising is quite serious, and in some years the valleys suffer considerable injury from the washings of the uplands, but no efforts have been made to check this evil. The most troublesome weeds are the burdock and stickle grass. None of the land now lies "turned out".

The *black prairie hog-wallow*, commonly designated as upland soil, and forming one-sixth of all the farming land, is from 9 to 30 inches in depth, and has a subsoil of tough bluish clay, intermixed with flint pebbles, the underlying rock being limestone. The natural growth is live and black-jack oaks and mesquite. The soil is best adapted to cotton, which forms nearly all the upland crops, and the height at which it is most productive is about 3 feet. The running to weed, owing to neglect in cultivation, may be restrained and bolling favored by plowing and hoeing. The lands yield, even after ten years' cultivation, 750 pounds of seed-cotton per acre. The most troublesome weed is the stickle grass. Very little land now lies "turned out", and when again taken into cultivation it produces well.

The *alluvial river bottom lands*, comprising one-half the lands of the county, extend along the Medina, Hondo, and Francisco Perez rivers for a distance of 26 miles. The natural growth is cypress, pecan, live oak, hackberry, and willow. Cotton in the lowlands is liable to be damaged by overflow in rainy seasons, growing profusely in leaves, and yields less than the uplands; but the lowlands are preferred to the uplands, because, owing to the late, dry seasons and long droughts, the cotton in the latter is most likely to dry out and die. The soil has a thick layer of humus and a depth of 3 feet, and is best adapted to corn; the subsoil is gravel, containing large flinty pebbles, underlaid by sandstone at 8 feet. Cotton forms one-half of the crops planted, and grows to a height of 5 or 6 feet. Overflow and neglect in cultivation cause the plant to run to weed, and remedy is the same as in the case of soil previously described. Fresh land produces 1,800 pounds of seed-cotton per acre, and the yield is the same after the land has been in cultivation for ten years. The most troublesome weeds are burdock and Spanish needles. None of the land lies "turned out".

Shipments are usually made after the picking, by wagon, to San Antonio, and thence by rail to Saint Louis, at \$5 per bale.

BANDERA.

Population: 2,158.—White, 2,127; colored, 31.

Area: 1,000 square miles.—Woodland, very little; all central black prairie.

Tilled lands: 11,628 acres.—Area planted in cotton, 223 acres; in corn, 3,641 acres; in oats, 259 acres; in wheat, 1,200 acres.

Cotton production: 52 bales; average cotton product per acre, 0.23 bale, 345 pounds seed-cotton, or 115 pounds cotton lint.

Bandera is a high, hilly, and broken prairie county, very sparsely settled, and principally devoted to stock-raising. The streams of the eastern and southern part of the county are tributaries of the San Antonio and the Nueces rivers. But little attention is given to the culture of cotton, there being only about 2 per cent. of the tilled lands in that crop.

The soil is mostly the stiff black prairie land of the central black prairie region, underlaid by soft white-limestone (Cretaceous). The county is very sparsely populated, the average being about 2.2 persons per square mile; that of lands under cultivation is 11.6 acres per square mile, or 1.8 per cent. of the county area.

John Christall, of Bandera, writes:

There is not enough cotton grown in this county to form data upon which any calculations could be made. The chief cotton soil is that of the valleys, which is black, from vegetable mold. The natural timber is live, post, and Spanish oaks, pecan, and cedar. The soil is 3 feet deep, having a subsoil varying from gravelly to clay. The land is early, warm, well drained, and easily tillable in either wet or dry seasons. The chief crops are corn and wheat, corn being the one best adapted to the soil.

UVALDE.

Population: 2,541.—White, 2,478; colored, 63.

Area: 1,550 square miles.—Woodland, a little; central black prairie, 610 square miles; southern prairies, 270 square miles; table-lands, 670 square miles.

Tilled lands: 3,466 acres.—Area planted in cotton, 141 acres; in corn, 1,345 acres; in oats, 91 acres; in wheat, 407 acres.

Cotton production: 53 bales; average cotton product per acre, 0.38 bale, 570 pounds seed-cotton, or 190 pounds cotton lint.

The surface of Uvalde county is rolling and broken, especially on the north, and is watered by a number of streams flowing southward. The southern part of the county is mostly a prairie, interspersed with timbered lands along the various streams, and included in the southwestern prairie region; the northern portion is hilly, with outcropping Cretaceous limestones, and embraces the black prairie lands of the central region, which are too broken for cultivation except in small areas. The crops of the county are corn, wheat, oats, etc., but a system of irrigation is necessary, because of the dryness of the seasons. The population does not average two persons per square mile, and stock raising is the chief occupation. Very little cotton is cultivated, owing in part to the great distance from market and the difficulty of transportation, as well as to the local causes mentioned. The lands under cultivation average 2.2 acres per square mile.

T. W. Redman, of Uvalde, writes:

About two-thirds of the county on the south is a rolling prairie, with heavy timber on the streams, consisting of mesquite, live oak, elm, and pecan, with some cypress, hackberry, and sycamore. On the north it is hilly, and is known as a part of the Anakacha range. Solid white limestone is abundant, with an occasional stratum of flint boulders.

NORTHWESTERN RED-LOAM PRAIRIE REGION.

Comprises all or parts of the cotton counties of Clay, Baylor, Archer, Jack, Young, Throckmorton, Jones, Shackelford, Stephens, Palo Pinto, Erath,* Eastland, Callahan, Taylor, Coleman, Brown, Comanche, San Saba, McCulloch, Mason, Llano, Burnet, Williamson,* Travis,* Blanco,* and Gillespie.*

BORDER COUNTIES OF THE COTTON REGION (with brief descriptions): Wichita, Baylor, Archer, Throckmorton, Jones, Shackelford, Callahan, Taylor, McCulloch, and Mason.

OTHER COUNTIES (not described): Hardeman, Wilbarger, Knox, Haskell, Runnels, Concho, Menard, and Kimble.

CLAY.

Population: 5,045.—White, 5,019; colored, 26.

Area: 1,100 square miles.—Woodland, very little; all northwestern red-loam prairies.

Tilled lands: 24,538 acres.—Area planted in cotton, 3,289 acres; in corn, 8,778 acres; in oats, 1,343 acres; in wheat, 2,282 acres.

Cotton production: 1,155 bales; average cotton product per acre, 0.35 bale, 525 pounds seed-cotton, or 175 pounds cotton lint.

Clay is one of the Red river counties of the northwestern prairie region. Its surface is high and rolling, with prominent hills and ridges. The country is mostly an open prairie, with skirts of timbered lands along the streams, and a growth of oaks, walnut, ash, elm, pecan, cottonwood, hackberry, mesquite, and bois d'arc. The county is well watered by the Little and Big Wichita rivers and their tributaries, all flowing into Red river.

Clay is chiefly a stock-raising county, for which its broad prairies are admirably suited. The lands have a red loam soil, very productive in fair seasons, yielding 800 pounds of seed-cotton per acre. The lands under cultivation comprise 3.5 per cent. of the area, an average of 22.3 acres per square mile. Corn is the chief crop, its acreage being more than twice that of cotton, which has an average of 3 acres per square mile. Gainesville is the nearest railroad point, to which cotton is hauled by wagon for shipment.

ABSTRACT FROM THE REPORT OF WILLIAM M. POPE, OF BUFFALO SPRINGS.

The upland soil consists chiefly of red prairie in bodies of from 160 to 500 acres, and a less amount of black prairies. These bodies are interspersed with groves of post-oak timber. The soil is chiefly a red loam, 18 inches deep, which contains soft, limy pebbles, and is underlain by soft sandstone at from 10 to 20 feet. The soil is easily tilled, early, well drained (for the most part), and best adapted to corn, cotton, and sweet potatoes. Cotton is the second crop of the county. The plant grows from 2½ to 3 feet high, and inclines to run to weed in wet weather, the remedy for which is to plow close to the roots. The seed-cotton product per acre is 800 pounds, 1,665 pounds making a 475-pound bale of second grade lint. The second year the staple is better and the proportion of seed is less. The rag-weed is most troublesome. On the uplands cotton can be planted ten days earlier, and fall frosts are three weeks later; therefore uplands are preferred. Cotton is shipped during the winter to Galveston and to Saint Louis.

JACK.

Population: 6,626.—White, 6,508; colored, 118.

Area: 870 square miles.—Woodland, some; all northwestern red-loam prairie.

Tilled lands: 29,338 acres.—Area planted in cotton, 4,751 acres; in corn, 10,990 acres; in oats, 230 acres; in wheat, 1,866 acres.

Cotton production: 1,444 bales; average cotton product per acre, 0.30 bale, 450 pounds seed-cotton, or 150 pounds cotton lint.

Jack is a rolling and somewhat hilly county, with open prairies and timbered lands, and is watered by some of the headwaters of the Trinity river, which flow in an easterly direction. The prairies cover the largest portion of the county, and have reddish sandy loam soils, mesquite grasses, and an occasional low growth of mesquite trees. (See analysis, page 37.) In the valley lands of these prairies the outcropping limestones (Carboniferous) frequently give to the soils a stiff black, calcareous nature, and this is the character of the lands along some of the streams, where there is a growth of burr and spotted oaks, elm, and hackberry. Post oak is perhaps the most prominent timber growth of the county, covering large bodies of the uplands, and is associated with black-jack oak on the ridges and hills. The ridges and chains of hills have usually a trend northeast and southwest, with abrupt sides to the southeast, narrow summits, capped with heavy beds of red sandstones, and gradual descents on the west into the broad open valleys, which, after a width of a few miles, are again terminated by another and similar chain.

The valley of Keechi creek, about 6 miles wide, is well timbered, and has a dark sandy loam soil, which is said to produce 1,000 pounds of seed-cotton per acre. In the southern part of the county are the post, red, and black-jack oak lands of the upper cross timbers, with deep sandy soils and associated red sandstones.

Jack is largely a stock-raising county, and its grassy prairies are well adapted to that purpose. The population is rather sparse, the average being not quite eight persons per square mile. Cultivated lands average 33.7 acres per square mile. Cotton is not a very prominent crop, its acreage comprising in the census year only about 16.2 per cent. of the lands under cultivation. Its average yield per acre was small.

ABSTRACT FROM THE REPORT OF C. M. SNODGRASS, OF JACKSBORO',

This county consists mostly of uplands, which embrace both prairie and timber lands. Three kinds of soils may be distinguished: the gray sandy, varying in color from gray to red, the black sandy, and the black waxy lands. The chief soil is the *gray sandy*, constituting about two-thirds of the tillable area. Mesquite and post oak on the uplands and burr and spotted oaks, elm, and hackberry on creeks and rivers form the timber growth. The soil is a fine sandy loam, 18 inches in depth, and overlies a subsoil which is a mixture of red and yellow clay, very deep, and which acts as a fertilizer when mixed with the soil. Rock is found at 20 feet. The land is easily cultivated, is early and well drained, and produces cotton, corn, and small grain. One-third of the crops is in cotton, which grows to a height of from 3 to 6 feet, running to weed in very wet seasons. Eight hundred pounds of seed-cotton are obtained per acre from fresh land or from land after thirty years' cultivation, 1,425 pounds being necessary for 475 pounds of lint, which rates as good, the staple from lands long cultivated rating better. Cocklebur and sunflower are the most troublesome weeds. No land lies turned out. There is considerable washing of the soil, but no serious damage arises therefrom.

Cotton is hauled by wagon to Fort Worth in November and December at \$2 50 per bale.

YOUNG.

Population: 4,726.—White, 4,709; colored, 17.

Area: 900 square miles.—Woodland, a large part; all northwestern red-loam region.

Tilled lands: 23,122 acres.—Area planted in cotton, 2,049 acres; in corn, 9,181 acres; in oats, 114 acres; in wheat, 1,947 acres.

Cotton production: 554 bales; average cotton product per acre, 0.27 bale, 405 pounds seed-cotton, or 135 pounds cotton lint.

The surface of Young county is rolling and broken, with high and prominent ridges that usually trend southwestward. These hills are formed largely of sandstone and conglomerate, frequently capped with red sandstone, and are timbered with a growth of post and black-jack oaks. Fossils of the Carboniferous period are found in some of the hills near Graham, the county-seat, and the sandstones that underlie them in the bed of the streams are saline in character. The valley lands lying between the ridges are sometimes open prairies, with some mesquite and scattering oak growth, and have a sandy soil.

The Brazos river pursues its tortuous course through the southern part of this county, with open valleys of reddish loam soils on either side, bounded by bold and rocky bluffs. These lands are said to produce from one-half to a bale of cotton per acre, and are the chief cotton lands of the county. The rest of the county is watered by streams that flow southward and are tributary to the Brazos. From Belknap mountain on the west there is said to be a rolling or undulating prairie that extends 100 miles north to Red river.

The lands under cultivation comprise 4 per cent. of the county area, with an average of 25.7 acres per square mile. Of the latter only 2.3 acres are devoted to the culture of cotton. The crops comprise corn, wheat, oats, rye, barley, and cotton, the acreage of the two former being the largest. Stock-raising also receives much attention in Young county.

STEPHENS.

Population: 4,725.—White, 4,700; colored, 25.

Area: 900 square miles.—Woodland, much; all northwestern red-loam prairie.

Tilled lands: 18,042 acres.—Area planted in cotton, 686 acres; in corn, 3,824 acres; in oats, 254 acres; in wheat, 2,187 acres.

Cotton production: 137 bales; average cotton product per acre, 0.20 bale, 300 pounds seed-cotton, or 100 pounds cotton lint.

Stephens county has a surface very similar to those counties already described, viz, rolling and broken, with prominent timbered ridges, and watered by streams flowing northward into the Brazos river. These ridges are largely formed of fossiliferous (*Productus*, *spirifer*, etc.) strata, overlaid by conglomerates and sandstones, and underlaid by crinoidal limestones, as seen in the valleys. The upper stratum of sandstone on the hills near Breckenridge, the county-seat, is solid, and has a thickness of about 4 feet. On its surface are commonly found fragments of sandstone, accompanied by rounded masses of red hematite, having frequently bright or specular surfaces; silicified wood also occurs.

The lands of the valleys are mostly open prairies, with mesquite and a scattering oak growth, and have soils varying from black clayey to a reddish, sandy loam. They are said to yield finely, even in very dry seasons, producing as much as 600 pounds of seed-cotton per acre. In good seasons the yield is said to be 1,200 pounds.

The valleys on Hubbard's creek are never forgotten by one who sees them. Level almost as a billiard-table, and covered with the finest of mesquite grass, which remains green nearly all winter, it would be difficult to find anything more beautiful and picturesque.—*Thrall*.

Stephens is chiefly a stock-raising county, and but a small proportion of its area (3.1 per cent.) is under cultivation, the average being 20 acres per square mile. The crops of the county are corn, wheat, cotton, oats, etc., the first two having the largest acreage. The average acreage of cotton is eight-tenths of an acre per square mile.

PALO PINTO.

Population: 5,885.—White, 5,797; colored, 88.

Area: 960 square miles.—Woodland, much; all northwestern red-loam prairie.

Tilled lands: 24,468 acres.—Area planted in cotton, 4,292 acres; in corn, 9,301 acres; in oats, 305 acres; in wheat, 2,425 acres.

Cotton production: 885 bales; average cotton product per acre, 0.21 bale, 315 pounds seed-cotton, or 105 pounds cotton lint.

The surface of Palo Pinto county is rolling and broken, and is divided by the Brazos river, which flows through it from northwest to southeast in a very irregular course. On the west and north are many high hills and ridges, with broad valleys of open mesquite prairie and timbered lands, and while often precipitous on the east, they have a gradual slope to the west, and are usually capped with crinoidal limestones and cherty rocks, or by their overlying red sandstone. In the eastern part of the county (east of the county-seat) the hills seem to terminate at the river (where heavy beds of pebble conglomerate occur), and from thence to the Parker county-line the country is rather level, and is timbered with a post and black-jack oak growth. The soil is sandy, with fragments of sandstone, has a tall growth of sedge-grass, and abounds in gopher holes. Underlying it, as seen in the east bank of the river, are strata of whitish sandstone with an exposed thickness of 50 feet.

The valley lands between the hills are the chief farming lands of the county. Their soils are red sandy loams, interspersed with areas of black waxy clay lands, and timbered with a growth of live and post oaks, mesquite, pecan, etc.

The lands under cultivation average 25.5 acres per square mile, or 34 per cent. of the county area. The corn crop has the largest acreage, that of cotton comprising 17.5 per cent. of the tilled lands, or an average of 4.5 acres per square mile.

ABSTRACT FROM THE REPORT OF J. A. M'LAREN, OF COKELAN.

The uplands of this county consist of rolling table-lands and prairies, and the soils are black waxy, gray mesquite, and sandy loams.

The *sandy loam lands* comprise one-half of the tillable lands of the county. The growth is live, post, and burr oaks, elm, pecan, and mesquite. The soil is about 18 inches in depth. The subsoil is a tenacious clay; and sand, gravel, and rock are found at 10 feet. The land is early, warm, and well drained, and easily tilled under all circumstances. Corn and wheat form the chief crops, wheat being best adapted to the soil. Cotton, forming about one-fifth of the entire crops, grows to a height of from 3½ to 5 feet, and runs to weed only during very wet seasons. Topping is the remedy applied to restrain it. The yield per acre of seed-cotton is from 800 to 1,000 pounds, of which 1,425 pounds are requisite for a 475-pound bale of lint, rating as good middling. The effect of cultivation cannot as yet be estimated, as this (1879) is only the third season in which cotton has been grown. The most troublesome weeds are careless, lamb's-quarter, sunflower, cocklebur, horse-nettles, and many others.

Cotton is hauled as soon as ginned to Fort Worth, the rate of freight being 30 cents per 100 pounds.

ERATH.

(See "Central black prairie region".)

EASTLAND.

Population: 4,855.—White, 4,837; colored, 18.

Area: 900 square miles.—Woodland, some; all northwestern red-loam prairie.

Tilled lands: 19,752 acres.—Area planted in cotton, 3,264 acres; in corn, 5,867 acres; in oats, 89 acres; in wheat, 1,941 acres.

Cotton production: 742 bales; average cotton product per acre, 0.23 bale, 345 pounds seed-cotton, or 115 pounds cotton lint.

The surface of Eastland county is rolling, with high ridges on the north and south, and is watered by the Leon river and tributaries. It is largely covered with a growth of post and black-jack oaks, with large mesquite prairies, on which there is a scattering growth of live oak.

The dividing ridge between the waters of Leon river and Hubbard's creek consists of a succession of bold, rocky hills, east of which the county is covered with a dense growth of post, black-jack, and other oaks, and is a fine country for hogs. On the west there are some fertile valleys, covered with mesquite grass, with good post oak timber convenient.—*Thrall.*

The county is sparsely populated, and a comparatively large proportion (3.4 per cent.) of its area is under cultivation, with an average of 21.9 acres per square mile. It is chiefly a stock-raising county, far from railroad facilities. The lands are well described in the following abstract:

ABSTRACT FROM THE REPORT OF A. J. STUART, OF EASTLAND.

The soil of the uplands is generally sandy, with occasional small prairies of black, sticky land. There are some large prairies of black waxy land on which live oak and mesquite once grew. The lands devoted to the cultivation of cotton comprise the dark sandy and black waxy of the first and second bottoms and valleys, sandy post oak land, and the black prairie and mesquite lands of the uplands.

The *dark or black valley land* is the most important, and constitutes about one-eighth of the county and one-half of the cultivated lands. Its growth is pecan, spotted oak, walnut, cottonwood, elm, and hackberry. The depth of the soil, which is a dark and waxy loam, is 2½ feet, its subsoil being a light yellowish clay, and in places gravelly. It is underlaid by rock at 20 feet. The soil is easily cultivated in wet seasons; but in dry seasons, when not well broken up, it is cultivated with difficulty. It is early, warm, well drained, and produces corn, wheat, barley, and cotton, cotton and wheat being best adapted to it. About one-third of the tillable area is devoted to cotton, which attains a height of from 4 to 5 feet, being most productive at the latter. The yield per acre of seed-cotton is 800 pounds, but were it not for the droughts 1,600 pounds would be the product; 1,545 pounds of seed-cotton make 475 pounds of lint, rating as middling. Twelve years' cultivation of the land does not decrease the above yield or lower the rating of the staple. Only a small portion of the land has been under cultivation ten years. The troublesome weeds are horse-nettle, broom-weed, sunflower, and cocklebur. The valleys are very level, and do not wash to any appreciable extent.

The *post-oak uplands* comprise about one-half of the county and one-fourth of the cultivated land, and have a growth of post and black-jack oaks. The soil is a dark, grayish, fine sandy loam 12 inches deep. The subsoil is usually a clay, red and hard when dry, and sticky when wet. It overlies sand, gravel, and rock at 25 feet. The soil is easily cultivated at all times, is early, warm, and well drained, and is best adapted to corn, cotton, potatoes, and wheat. About one-third of the crops is in cotton, whose growth is 3½ feet, 4 feet being the most productive height; it produces from 600 to 1,000 pounds of seed-cotton per acre, 1,545 pounds of which are required for a 475-pound bale, which rates as middling. The yield is not diminished in any way after the land has been under cultivation for five years.

The *black prairie and mesquite lands* have a growth of mesquite and a few scattering live and post oaks. This land comprises about one-quarter of the lands under cultivation, and about the same proportion of the county. The soil is a black prairie loam 1 foot in depth, having a lighter subsoil of yellowish clay, in some places a red clay, and in others gravelly; it contains white gravel and flinty pebbles. Sand, gravel, and rock are found at 15 feet. The land is easily cultivated in wet seasons, but not so in dry ones. It is early, warm, and well drained. The soil is best adapted to wheat and cotton, the latter, forming two-fifths of the entire crops, growing to a height of 3½ feet, 5 feet being the most productive. It yields from 600 to 1,000 pounds of seed-cotton per acre, which after four years is increased from 800 to 1,400 pounds, 1,545 pounds being necessary for 475 pounds of lint, which rates as middling. There are no very troublesome weeds on this land, but hog-weed and cocklebur cause some slight trouble. No land lies turned out; neither is there any running to weed of the cotton-plant on any of the lands of the county.

In this county dry weather has damaged cotton more than any other evil. The land generally being fresh and never properly brought into cultivation, has suffered more from drought than it would have done otherwise.

Shipments are made in November and December, by wagon, to Fort Worth at \$3 per bale.

COLEMAN.

Population: 3,603.—White, 3,568; colored, 35.

Area: 1,240 square miles.—Woodland, some; all northwestern red-loam prairie.

Tilled lands: 17,017 acres.—Area planted in cotton, 796 acres; in corn, 4,333 acres; in oats, 90 acres; in wheat, 1,568 acres.

Cotton production: 243 bales; average cotton product per acre, 0.31 bale, 465 pounds seed-cotton, or 155 pounds cotton lint.

Coleman, one of the western border counties of the cotton region, lies on the north side of the Colorado river, into which flow the many streams that water the country. The surface is undulating, with several high and prominent peaks in the central and northern portions; the southern portion is mostly open prairies.

The soils are black and sandy loams, and very productive, the crops being corn, wheat, rye, oats, cotton, and all of the vegetables. There is plenty of timber for fencing and building purposes. The grasses are excellent, and the county is finely adapted to stock raising.—*Thrall.*

The country is sparsely populated, and but a small proportion (2.1 per cent.) of the area is under cultivation, with an average of 13.7 acres per square mile. Of the latter but six-tenths of an acre is devoted to cotton.

The live-stock comprises 60,334 head of cattle, 28,419 sheep, and 4,336 hogs.

BROWN.

Population: 8,414.—White, 8,291; colored, 123.

Area: 1,200 square miles.—Woodland, much; central black prairie, 60 square miles; northwestern red loam, 1,140 square miles.

Tilled lands: 45,655 acres.—Area planted in cotton, 4,254 acres; in corn, 12,408 acres; in oats, 516 acres; in wheat, 7,814 acres.

Cotton production: 998 bales; average cotton product per acre, 0.23 bale, 345 pounds seed-cotton, or 115 pounds cotton lint.

The surface of Brown county is rolling and broken, with high and prominent ridges and hills; on the south and west there are said to be broad prairies. It is watered by numerous creeks flowing southward into the Colorado river, which forms a part of the southern boundary. The hills or mountains, some of which have broad summits, are usually timbered with post oak, or sometimes with only a low scrub or brush growth, as on the south. The soils are sandy, often red in color, and in places are filled with masses of white and pinkish quartz fragments. The hilly portion of the county is but little inhabited. The valleys between the hills and along Pecan creek are usually rather open or covered mostly with a mesquite growth, interspersed with sandy post-oak lands. The soil is a stiff red loam, more or less clayey, and very productive, and similar to the lands of San Saba county. Limestones outcrop in many of these valleys, while the hills are often capped with sandstones and quartzites.

The lands under cultivation comprise 5.9 per cent. of the county area, with an average of 38 acres per square mile. The chief crops are corn, wheat, cotton, oats, potatoes, etc., the acreage of cotton being 3.5 acres per square mile.

Brown is an excellent stock-raising county. White labor is almost exclusively used, the wages being from \$10 to \$15 per month.

Shipments are made to Fort Worth by wagon.

COMANCHE.

Population: 8,608.—White, 8,529; colored, 79.

Area: 930 square miles.—Woodland, greater part; central black prairie, 170 square miles; northwestern red loam, 180 square miles; upper cross timbers, 580 square miles.

Tilled lands: 44,191 acres.—Area planted in cotton, 9,301 acres; in corn, 14,267 acres; in oats, 460 acres; in wheat, 5,074 acres.

Cotton production: 2,098 bales; average cotton product per acre, 0.23 bale, 345 pounds seed-cotton, or 115 pounds cotton lint.

The surface of Comanche county is rolling, but in places it is hilly. The eastern part is mostly an open prairie; the western and middle is generally covered with a timber growth of post and black-jack oaks, and belongs to the upper cross timbers belt, but is interspersed with prairies. The county is watered by the Leon river and its tributaries, flowing southeastward. The lands of the prairies are of the black waxy and calcareous character common to the central prairie region, of which they are a part, and are underlaid by stiff clays and the limestones of the Cretaceous formation. They are covered with grasses, and are generally used for stock grazing. The timbered uplands are sandy to a depth of from 12 to 18 inches, and are somewhat pebbly and underlaid by reddish clay subsoils. That portion of the region between the Comanche and Leon rivers on the east is very level. The soils are easily tilled, and produce an average of about 500 pounds of seed-cotton per acre. The valley lands of the streams are narrow, and have a dark loam soil, with a timber growth of pecan, walnut, elm, burr oak, etc. Mustang grape-vines are abundant. It is largely a stock-raising county. The lands under cultivation comprise 7.4 per cent. of its area, with an average of 47.5 acres per square mile. Of these about 10 acres for each mile is devoted to the culture of cotton, corn being the chief crop.

ABSTRACT FROM THE REPORT OF W. L. SARTWELL, OF COMANCHE.

The uplands are rolling, with some high hills or table-lands, interspersed with prairies of black and sandy soils and sandy post-oak lands.

The most important soil for cotton cultivation is the *black upland prairie*. Its growth is mesquite and scattering post oaks. About one-sixth of the lands of the county belong to this variety. The soil, which varies in character and color, is 2 feet deep. The subsoil is a tough yellow clay, baking hard when exposed, impervious when undisturbed, but is much improved by cultivation; it is underlaid by limestone at from 5 to 10 feet. The soil is easily cultivated in wet seasons, but quite difficult in dry ones. It is early and well drained, and produces wheat, corn, and other grains, being best adapted to cotton as a sure crop. There is an occasional trouble from droughts, which dwarf the plant. Cotton grows to a height of from 3 to 4 feet, yielding 1,000 pounds of seed-cotton per acre, the amount necessary for a 475-pound bale being 1,545 pounds. The staple rates as fair. The effect of cultivation of the land cannot, as yet, be estimated, as this (1879) is only the third or fourth year in which cotton has been planted in the county. Careless, cocklebur, and sunflower are the most troublesome weeds on all the soils.

The *sandy post-oak land* covers about two-thirds of the surface of the county, and has a natural timber growth of post and black-jack oak. The soil is a grayish sandy loam, about 2 feet deep, overlying a yellow clay subsoil, which is underlaid by sand-rock at 20 feet. It is easily cultivated, and is early, warm, and well drained. The chief productions are cotton and corn, both of which do well, the former constituting about one-fourth of the whole crops. The plant grows to a height of from 3 to 5 feet, and yields 1,000 pounds of seed-cotton per acre, 1,485 pounds of which are necessary for 475 pounds of lint, rating as fair.

The *dark loam alluvial lands*, with a natural timber growth of mesquite and oak, comprise one-sixth of the lands of the county. The soil is 10 feet deep, is cultivated with difficulty in wet seasons, and is early, warm, and well drained, and best adapted to grains. The subsoil is clay, overlying rock at 20 feet. Cotton, forming about one-tenth of the entire crops, grows to a height of from 5 to 6 feet, and yields 1,500 pounds of seed-cotton per acre, 1,665 pounds being requisite for a 475-pound bale, rating as ordinary.

Shipments are made from September to December inclusive, by wagon, to Fort Worth and Waco, and thence to Galveston, the rate of freight being \$2.50 to Fort Worth and \$7 to Galveston.

SAN SABA.

Population: 5,324.—White, 5,183; colored, 141.

Area: 1,130 square miles.—Woodland, much; all northwestern red-loam region.

Tilled lands: 21,075 acres.—Area planted in cotton, 2,819 acres; in corn, 8,281 acres; in oats, 675 acres; in wheat, 3,148 acres.

Cotton production: 400 bales; average cotton product per acre, 0.14 bale, 210 pounds seed-cotton, or 70 pounds cotton lint.

San Saba county is bounded on the north and east by the Colorado river, into which all of the streams flow. The surface of the county is hilly and broken, the valley lands along the streams and between the hills comprising almost the only tillable lands. The rocks vary from the cherts, conglomerates, and sandstones of the mountains usually to the underlying limestones of the valleys, all belonging, so far as known, to the Palæozoic series. The lands of the county vary from the sandy soils of the post-oak uplands to the brown and red loams and black waxy prairies and timbered lands of the valleys and bottoms of the San Saba river. (See analysis, page 47.) The prairies have usually a growth of mesquite and scattering live and post oaks, while that of the bottoms comprises pecan, elm, sycamore, cottonwood, etc. Cedar, black-jack, and other oaks, etc., are found on the hills.

The lands under cultivation comprise 2.9 per cent. of the county area, an average of 18.7 acres per square mile. They are better adapted to grain than to any other crop, and but a comparatively small acreage is given to cotton. The seasons are so droughty that irrigation is often resorted to.

The average yield per acre of the crops is said to be: corn, 5 bushels; wheat, 0.4 bushels; oats, 13 bushels.

- ABSTRACT FROM THE REPORT OF J. FRAZER BROWN, OF SAN SABA.

The timbered lands along the creeks (tributary to the Colorado river) have an alluvial soil, and black prairie lands extend from this to the rocky hills on the north and gray to the orange red sandy land on the south. The timber consists of elm, pecan, hackberry, willow, and live oak. The creek bottoms are from 100 yards to 1 mile wide.

The *black mesquite prairies* have a black sandy loam soil about 2 feet thick. A whitish, calcareous loam and a yellow clay constitute the subsoil of most of the black lands, while the gray and red lands have a red-clay subsoil. The clays are impervious, and contain flinty, rounded pebbles. The subsoils are underlaid by rock at 10 feet. The soil is easily tilled when dry, but with difficulty when too wet; it is cold but well drained, and is best adapted to small grains. The chief crops of this region are wheat and corn. One-fifth of the cultivated area of these lands is planted in cotton. The plant grows from 4 to 7 feet high, and is most productive at about 5 feet. It inclines to run to weed in wet weather, and as a remedy some have tried topping about July 1, also in the dark of the moon of August, with good results. The seed-cotton product per acre of fresh land is 1,700 pounds in good seasons, 1,615 pounds then making a 475-pound bale of low middling to good ordinary lint; but in dry seasons it takes 1,900 pounds to make such a bale. This land is still fresh, and has been cultivated only a few years. The cocklebur, carelessness-weed, and another that has lately appeared, are the most troublesome weeds. The drainage from higher lands is conducted upon cultivated fields, fertilizing and irrigating the same, and almost insuring a crop. The only hinderance to the cotton crop is a deficiency of rain about every fourth year. The gray and red sandy soils of this section produce on the average as much as the black loams, because it withstands the droughts the best. This is the case where there is a red-clay subsoil.

Cotton is shipped in November and December, by wagon, to Round Rock and to Austin at 50 cents per 100 pounds, and thence by rail to Galveston.

LLANO.

Population: 4,962.—White, 4,896; colored, 66.

Area: 900 square miles.—Woodland, much; all northwestern red-loam prairie.

Tilled lands: 17,553 acres.—Area planted in cotton, 2,247 acres; in corn, 7,700 acres; in oats, 209 acres; in wheat, 1,145 acres.

Cotton production: 469 bales; average cotton product per acre, 0.21 bale, 315 pounds seed-cotton, or 105 pounds cotton lint.

The surface of Llano county is broken and somewhat mountainous. It is generally timbered with mesquite, post and live oaks, pecan, and mountain cedar, and is watered by the Llano river, which flows east through the middle of the county and unites with the Colorado at the boundary. A number of the mountains are composed of granites and other metamorphic rocks, and copper, gold, and other minerals are reported by the state geologist as accompanying them. The Enchanted Rock and Packsaddle mountains are two of the most prominent. Between the hills and mountains there are broad valleys with red clayey lands, very deep, which comprise the chief agricultural lands of the county, and are described in the abstract below.

Llano is chiefly a stock-raising county, there being but 3 per cent. of its area under cultivation, or an average of 19.5 acres per square mile. A fair percentage (12.8) of cotton is planted, although the county is so far from railroad facilities and markets.

- ABSTRACT FROM THE REPORT OF C. M. COGGIN, M. D., OF BLUFFTON.

The surface of the county is rolling and broken, having mostly a red-clay and sandy soil in the valleys and black lands in the bottoms on the rivers. There is some black hog-wallow soil on the mountains.

The chief soil is the *red clay on the uplands*, covering about one-fourth of the surface of the county, and running with each ledge of the mountains with a width of from one-fourth to one-half mile, the natural timber growth of which is mesquite, pecan, and post and live oaks. The soil is several feet deep, and is underlaid by sand and gravel at from 8 to 10 feet. It is easily tilled, and is early, warm, and well drained. Corn, cotton, wheat, oats, barley, and Hungarian grass form the chief crops. About one-fourth of the cultivated land is in cotton, but the soil seems best adapted to cotton, wheat, and barley. The height usually attained by the plant is 4 feet, yielding 850 pounds of seed-cotton per acre, 2,020 pounds being necessary for a 475-pound bale of lint, rating very good. Cultivation of the land for ten years does not affect the above product or the rating of the staple. There is a tendency of the plant to run to weed in July or August if there is too much rain, but no remedy has as yet been tried. The uplands are preferred, because on them the plant runs less to weed than on the river bottoms. No land lies "turned out". On our soils there are no troublesome weeds, this being a frontier county. Cotton is hauled by wagon to Austin, Red Rock, and Galveston at 50 cents per bale, the time being from October to March.

BURNET.

Population: 6,855.—White, 6,607; colored, 248.

Area: 1,000 square miles.—Woodland, much; central black prairie, 350 square miles; northwestern red loam, 650 square miles.

Tilled lands: 37,168 acres.—Area planted in cotton, 7,024 acres; in corn, 14,187 acres; in oats, 1,997 acres; in wheat, 5,173 acres.

Cotton production: 1,399 bales; average cotton product per acre, 0.20 bale, 300 pounds seed-cotton, or 100 pounds cotton lint.

Burnet county is bounded on the west partly by the Colorado river, which flows southward until near the lower part of the county, when it turns almost at right angles to the east. The surface of the country is rough and broken, with high timbered hills and rather narrow valleys of mesquite prairies. A large part of the county is said to be covered with dense cedar brakes, and it is generally rocky. There is also much post and live oak.

The lands of the Colorado river and tributaries have a red or chocolate-colored loam, timbered with a growth of cottonwood, elm, hackberry, pecan, etc. The lands of San Gabriel and its tributaries are black alluvial loams. The southern and western part of the county is included in the northwestern red-loam region, and its rocks are reported to be principally sandstones, with large granite outcrops. On the northeast and other parts of the county the Cretaceous limestones are found, giving to the low prairie valleys a black calcareous soil.

Burnet county is sparsely settled, and the lands under cultivation comprise 5.8 per cent. of its area, averaging 37.2 acres per square mile, and are chiefly confined to the valley and bottom lands of the streams. Corn is the chief crop, the average of cotton being but 7 acres per square mile.

ABSTRACT FROM THE REPORT OF A. SCHROETER, OF DOUBLE HORN.

The lowlands are the first bottoms of the Colorado river and numerous small flats along different creeks; then the elm flats, or second bottoms, lie just above these, with their growth of elm and mesquite.

The uplands are mostly prairies, with a variety of soils. The cotton lands are river valley lands, comprising about 30 per cent. of those under cultivation. The black mesquite lands (about 20 per cent.), and the elm flats, lands sheltered from the dry, bleaching west winds, are generally preferred for cotton, as these winds prevail during the spring, when the plants are young and tender.

The *river lands* extend along the Colorado river for 25 or 30 miles through the county, and have usually a red sandy loam soil 2 feet or more in depth, underlaid by a heavier red-clay loam, sometimes containing rounded pebbles, and is itself underlaid by a limestone at from 30 to 40 feet. The growth on this land is post oak, hackberry, black-jack, and pecan. The soil is easily cultivated, and produces corn, cotton, oats, and wheat. It is best adapted to corn, though about 40 per cent. of cotton is planted. The height of cotton on this soil is 3½ feet; it yields 1,500 pounds of seed-cotton per acre, 1,485 pounds being required for 475 pounds of lint. It rates as good middling in the market. After ten years' cultivation no change is observed in either the productiveness of the soil or the quality of the staple. Grass is most troublesome. The soil washes or gullies very slightly.

Black mesquite flats are found in almost every part of the county, and have a scattering growth of mesquite and post oak. The soil is a black prairie clay, 18 inches in depth, underlaid by lighter subsoil, which contains soft, white fragments of gravel. Limestone underlies this at from 6 to 8 feet. It is an early and warm soil if well drained, and is best adapted to wheat. Cotton reaches a height of 3 feet on this soil, is not troubled with weeds to any extent, and produces as well as on the river lands.

The *elm flats* are scattered over the county, and have a heavy clay soil, mixed with sand at a depth of 18 inches, underlaid by limestone at 6 feet. Their growth is elm and mesquite. The soil is well drained, not difficult to till in wet seasons, and is best adapted to corn and oats. Cotton grows to a height of 3 feet, seldom runs to weed, and produces 1,500 pounds of seed-cotton per acre, the lint rating as middling. Purslane is the most troublesome weed.

Shipments of cotton are made before Christmas, by wagon, to Austin, freight per bale being \$2 50.

WILLIAMSON.

(See "Central black prairie region".)

TRAVIS.

(See "Central black prairie region".)

BLANCO.

(See "Central black prairie region".)

GILLESPIE.

(See "Central black prairie region".)

BORDER COUNTIES OF THE COTTON REGION.

Wichita county, producing 43 bales of cotton; Baylor, 83; Archer, 43; Throckmorton, 10; Jones, 19; Shackelford, 5; Callahan, 86; McCulloch, 54; Mason, 64; with Gillespie, Kerr, Bandera, and Uvalde, of the central prairie region, form a western border for the Texas cotton region of 1879, reaching from the Red river to the Nueces, or, in other words, to a tier of counties on the Rio Grande which do not produce cotton. Wilbarger, Hardeman, Knox, Haskell, Taylor, Runnels, Concho, and Kimble form a nearly unbroken north and south line still west of the border cotton counties, with lands adapted to cotton but reporting none for market. These counties are not even all organized.

Cotton is planted as farming begins. Stock raising is the predominant interest in all this sparsely settled region. There is some mesquite growth in part of the region, and a little other timber; cedars on the most broken parts, and some live, post, and black-jack oaks, pecan, cottonwood, elm, and walnut, especially near streams.

The following brief descriptions are given of the counties in which any cotton is produced; but for statistical information the reader is referred to Tables I and II, at the beginning of the report:

WICHITA.—The surface is mostly a rolling and hilly prairie, with tillable lands along the streams, timbered with cottonwood and mesquite trees. The amount of tilled lands is very small (4.2 acres per square mile), and they are chiefly devoted to corn. Cotton is little else than an experiment at present, though a successful one, with a product per acre larger than in very many counties whose production is very great. The soil of the prairie is the red sandy loam common to this region.

BAYLOR.—The surface is generally an open rolling and broken prairie, with a brushy mesquite growth along the streams. The Brazos and Big Wichita rivers and their tributaries flow through the county, but their waters are mostly unfit for use because of their salty and brackish character. The soil of the prairies is a red sandy loam, associated with veins of gypsum, and as yet but little under cultivation.

ARCHER.—The surface is an open and rolling prairie, very rough in places, and having but little growth even on the streams. There is some post oak in places. The county is watered by numerous small streams, all flowing northeastward into the Red river. The lands of the county have a reddish sandy loam soil, and there are said to be some fine valley lands on several of the creeks.

THROCKMORTON.—The surface is broken and hilly, and is well timbered with live and post oaks and mesquite on the uplands, and pecan, cottonwood, and hackberry on the creek bottoms. The soil is generally a red loam, with areas of black clayey lands on the south. The tillable lands lie along the streams. The acreage of tilled lands is small, and is nearly entirely devoted to corn and wheat crops. The county is one of the extreme western of those producing any cotton at all, and would have been left out of the list entirely had not an enterprising farmer determined in 1879 to plant it as an experiment. The following description is given by Charles McCormick, of Throckmorton:

The face of the country is rolling, sometimes broken into hilly ranges. The soil is on the whole above the average of the region, and a good portion of it is very choice land, finely adapted to the growth of cotton, corn, wheat, rye, oats, millet, etc. Much of the soil is of a reddish or mulatto nature, similar to the Brazos river lands; a portion of it is of a black sandy character, some sticky. Gypsum beds occur in Haskell, the adjoining county on the west. The first cotton ever raised in this county was planted in 1879 by J. T. Roff, and notwithstanding the fact that it was an unprecedentedly dry year he produced three-fourths of a bale per acre.

JONES.—The surface is broken, with high ranges of hills and abrupt bluffs of sandstone and limestone (Cretaceous). "A range of sand hills several miles wide runs north of and parallel with the Elm fork." The growth of the uplands is mostly mesquite—on the hills some live oak and cedar, and on the streams elm, pecan, and hackberry, with some post oak, cottonwood, etc. "The soil is a red loam, more or less sandy, becoming darker in the southeastern corner of the county."

SHACKELFORD.—The surface is broken, with a high range of hills forming the "divide" between the waters of the Clear fork of the Brazos river and Hubbard's creek. These hills are formed of sandstone and limestone, and are densely timbered, while the valleys have generally a growth of mesquite trees. The lands are of the red sandy loam peculiar to the region, but are not much under cultivation.

CALLAHAN.—This county has a rolling and broken surface, with high ridges and prominent hills, two of the most prominent being East and West Caddo peaks, on the southeast. The northern part of the county is drained by tributaries of the Brazos, the southern by those of the Colorado river. The county is about equally divided between prairie and timber. It is a fine grazing county, with a fair proportion of good arable land. There is an abundance of good timber and pure water, and the soil is rich, particularly in the valleys. The lands comprise the red and dark sandy soils already described in the adjoining counties.

William H. Parvin, of Belle Plain, reports that cotton was first raised in this county in 1877.

TAYLOR.—No cotton was reported by the census enumerators as having been produced in this county in 1879. The following abstract, however, from the reports of Messrs. N. N. Browne and J. S. Porter, of Buffalo Gap, affirms that cotton has been successfully raised in small quantities:

One-fifth of the county is mountainous; the rest is level or rolling prairie and mesquite, elm, and pecan valleys. There are, strictly speaking, no lowlands. The soils comprise many varieties: dark, light, and red loams; dark, or a red and stiff hog-wallow; and some heavy beds of sand. These are the timbered lands of the county, covered with post-oak; live oak is abundant in places. The mountains have considerable cedar, and frequently along streams there is a growth of elm, pecan, hackberry, plum, cherry, walnut, and willow.

The chief soil is the *dark loam*, comprising about one-third of the county, which occurs in areas of from 4 to 5 miles in width, and has a natural growth of mesquite trees and mesquite grass. The soil is a heavy loam, frequently putty-like in texture, varying in color from buff and brown to black, and its depth is about 3 feet. The subsoil is generally a reddish clay; sometimes it is of a light color and intermixed with pebbles, and is underlaid by sand and gravel, and then by red clay at about 20 feet. The soil is nearly always easily tilled, is changeable in regard to warmth and cold, is well drained, and best adapted to wheat, oats, millet, corn, potatoes, sorghum, and squashes, and probably not quite a fiftieth of its area is devoted to cotton culture. The average height of the cotton-plant is 4 feet, which is probably the most desirable height, as the plant is not inclined to run to weed too much. The seed-cotton product per acre of fresh land is about 1,200 pounds, 1,545 pounds of which make a 475-pound bale of lint. In counties east of here there is but little difference in yield, etc., after the first thirty or forty years' cultivation. The troublesome weeds are sunflower, horse-nettle, milkweed, and cockleburrs. None of this land lies "turned out". The soil washes some in places, but is generally too level to be injured or to damage the valleys by the washings.

The *red-loam soil* comprises probably about one-fourth of the county, and is chiefly confined to the numerous creeks running north to the Brazos river. The natural growth is mesquite trees and mesquite grass. The soil is a heavy clay loam, often stiff, mahogany to orange-red in color, and from 5 to 6 feet deep. The subsoil varies; sometimes it is red clay, and sometimes sand and gravel, is leachy, contains some pebbles, and is underlaid by sand and gravel, and in places by rock at from 15 to 20 feet. The soil is easily tilled, rarely too wet, is early, warm (changeable), well drained, and but very little of it is devoted to cotton. The plant varies from 2½ to 5 feet in height, 3½ to 4 feet being the most desirable. With too much rain and cultivation the plant inclines to run to weed; this rarely occurs, and is remedied by topping when in bloom. The seed-cotton product, etc., is the same as on the dark loam soil.

The red stiff "hog-wallow" land occurs in bodies, the largest being about 2 miles across; it bears (naturally) mesquite trees and mesquite grass. The soil is from 2 to 6 feet deep. The subsoil is generally pure clay, but has gravel in some places, and is underlaid by sandstone at various depths. This is probably our richest soil, but the heaviest to cultivate; it is late, cold, and well drained. A very small part of it is planted in cotton. The height of the plant has not been well noted; it would probably grow quite tall. In favorable seasons the seed-cotton product per acre of fresh land is from 1,200 to 1,500 pounds, 1,545 pounds making a 475-pound bale of lint. It is not likely that forty years' cultivation (unmanured) would make any difference in the quantity or quality of the cotton product of this land. The troublesome weeds are the sunflower and cocklebur. Few slopes are in cultivation; at any rate, the country is too level to admit of serious damage to slopes by washing and gullying.

The county being only recently settled, not much cotton has yet been planted, but, so far, results are satisfactory. The greatest success in cotton production, judging from three years' trial, cannot here be expected, on account of the springs being usually too dry to insure a good stand every year, and because a portion of the crop is liable to destruction by the high winds that usually prevail during the fall; and during the spring, and until the middle of June, comes the occasional "norther", reducing the temperature in an hour's time to the freezing point of water. This norther season is generally succeeded by long hot droughts.

Cotton is sent as baled, by wagons, to Fort Worth and Waco at from \$2 to \$3 per bale, and then shipped by rail to Galveston at \$4 per bale.

MCCULLOCH.—This county lies on the south side of the Colorado river into which the northern part is drained by small streams. Through the central part flows Brady's creek in an easterly course into the San Saba river, which comes from the southwest. The surface of the county is hilly and broken with prairie valley lands having brown and red loam and black waxy soils covered with a growth of mesquite, and very similar in character to the lands of San Saba county.

MASON.—The surface of Mason county is rolling and broken, and is largely timbered with post and black-jack oaks on the northwest. It is watered chiefly by the Llano river and tributaries, the San Saba river crossing the northwest corner of the county. It is said to be the best timbered county in western Texas. Pecans grow in great quantities on the rivers. The central and southwest portions are said to abound in mesquite flats, with much outcropping granite rock. The lands embrace the red sandy and black loam soils common to this western prairie region.

The following description is given by H. M. Holmes, of Mason:

The surface of the county is very uneven. The rivers have but little bottom land; the uplands have red sandy loam and black loam soils and a growth of post, live, and black-jack oaks. The most important with reference to cotton culture is the red sandy, which covers about one-half the surface of the county. Its depth is from 4 to 10 feet, overlying decomposed granite. Limestone and shales underlie the black loam. The chief crops are corn, oats, rye, cotton, and wheat. About one-tenth of the cultivated lands is devoted to cotton, which yields from 750 to 1,000 pounds of seed-cotton per acre, 1,425 pounds being required for a 475-pound bale. The year 1879 was the first year in which cotton was planted in the county, and, unfortunately for the experiment, the season was one of long drought. The soil washes readily on slopes, and no efforts have been made to check the damage, which is sometimes of a serious nature. Creek beds have sometimes been filled up by these washings. Jamestown and bur weed are most troublesome weeds on this soil.

Cotton is shipped in November, by wagon, to Austin, the rate of freight being three-fourths of a cent per pound.