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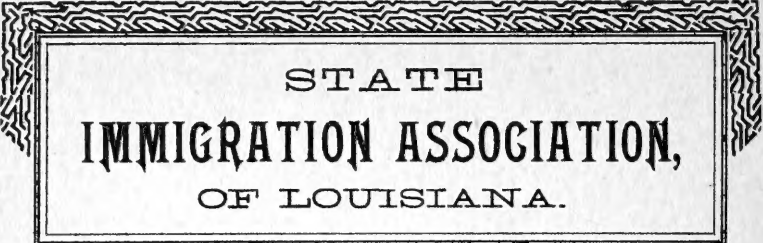


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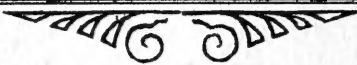
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# Louisiana

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1895.

STATE  
IMMIGRATION ASSOCIATION,  
OF LOUISIANA.



No. 620 Common St.,

NEW ORLEANS, LA.

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A HAND-BOOK

... OF ...

# LOUISIANA,

... GIVING ...

GEOGRAPHICAL AND AGRICULTURAL FEATURES.

... TOGETHER WITH ...

## Crops that Can be Grown,

Description of each Parish, Climate, Health,

Education, Fish and Oysters, Rail-

roads, and Watercourses.

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COMPILED AND WRITTEN BY REQUEST

... FOR ...

## The State Immigration Association,

... BY ...

WM. C. STUBBS, Ph. D.,

... DIRECTOR ...

STATE EXPERIMENTAL STATIONS.

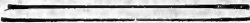
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NEW ORLEANS:

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1895.

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**I**F you know of a farmer who desires to better his condition, you will do him an act of kindness by handing him this pamphlet.

Louisiana can furnish homes for thousands of farmers who will be welcomed.

Those desiring information about location and lands should address,

HARRY ALLEN, President,  
STATE IMMIGRATION ASSOCIATION,  
620 Common Street,  
New Orleans, La.



7 OCT 1905  
D. of D.

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SUGAR EXPERIMENTAL STATION,  
AUDUBON PARK,  
NEW ORLEANS, LA., Jan. 1st, 1895.

HIS EXCELLENCY MURPHY J. FOSTER,  
*Governor of Louisiana:*

SIR—I hand you herewith the M. S. of the hand-book of Louisiana, which your Excellency requested me to write for publication through the State Immigration Association. It has scarcely been a month since this request was communicated to me and the very short time allowed has proven inadequate for an exhaustive treatise upon so fertile a subject as Louisiana. Besides, my official duties have been particularly heavy during the grinding season, and hence only a small portion of the time given me was available for the work assigned. However, I have collected hastily, the salient facts relative to Louisiana and trust they may subserve the purpose of attracting to our State many worthy immigrants. I have freely used all *reliable data* obtainable without giving credit to any one, since such a pamphlet must be largely a “compilation.”

Respectfully submitted,

WM. C. STUBBS,  
Director.

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“Of the typical population of Louisiana, also, a special mystery seems to be made, but Louisianians have much reason to be proud of their historical descent. They have a history as authentic and as valuable as the annals of the Puritans of Massachusetts, or that of Catholic Maryland. The rearing of the States’ colonial structure by one nation and its blending into colonial dependance upon another, contains no special mystery. They are hospitable, brave and generous people, whether tracing their history back to French Bienville or Lausatt; to Spanish O’Reily or Saleedo, or to American Claiborne.

That is the native State autonomy, which, blended with English, Irish, and Scotch emigration and the descendants of the Cavalier and Huguenot settlers from Virginia, Kentucky, Georgia, Alabama and the Carolinas, make up the population of Louisiana. A people exhibiting all those finer traits which betoken the cultivation of noble traditions and refined associations, evidenced in the generous hospitality, the chivalric spirit, the punctilious courtesy, the knightly hand, the Christian knee, the clean firesides and the holy altars cherished in the hearts and homes of as proud and pure an aristocracy as the world has ever known.”

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# LOUISIANA

Governor Murphy J. Foster, in his last message to the legislature of this state, used the following forcible language relative to the agricultural interests of Louisiana:

Louisiana has nearly 45,000 square miles of territory, containing some 28,000,000 acres. Of this amount about 13,000,000 is of alluvial origin and the rest good upland. The alluvial region is now only cultivated along the banks of rivers; and the rivers protected mostly by public and private levees. The uplands are almost all susceptible of cultivation.

The geological position of Louisiana forbids the existence of mineral products, save salt and sulphur, and the general low topography furnishes no water power for the wheels of manufactories. Louisiana must therefore remain for a long time as an agricultural state. Of her 28,000,000 acres, not quite 3,000,000 are in cultivation. Upon these acres there were grown last year products valued at some \$75,000,000, distributed as follows:

Sugar	\$35,000,000
Cotton	21,000,000
Rice	3,000,000
Fruits and vegetables	2,000,000
Corn, oats and hay	10,000,000
Oranges	1,000,000
Live stock and other products	3,000,000

From these figures very interesting and instructive deductions might be drawn of the per-capita distribution of money resulting from the value of agricultural products alone.

All of her uplands can be cultivated under scientific methods, and be made to yield profitable returns. This has been demonstrated by the settlements made on the Illinois Central Railroad, in the pine woods of east Louisiana, and on the Southern Pacific, in the prairies of southwestern Louisiana. A thrifty, industrious and intelligent yeomanry from the northwest has converted these lands into prosperous village farms, profitable to the owners, to the parishes in which they are located, and to the state.

After our present levee system has been perfected, much of our alluvial lands, by proper drainage, can be reclaimed, adding to our present arable area thousands of acres of the most fertile land on the globe. To improve the land now occupied, by introducing the best systems, rotation of crops, preparation, cultivation and fertilization of the soil, is the present duty of our state. Simultaneous with this development must come at an early day a large demand for unimproved lands by the inhabitants of the colder regions of the north.

To the thoughtful students of Louisiana's resources, as well as to the true patriotic citizen striving for the future welfare of his state, it is apparent that every effort must be made by the state to develop our rural interests along the lines of the most advanced agricultural teaching.

Louisiana is situated between the parallels of 28 degrees 56 minutes and 33 degrees north latitude, and the meridians of 89 degrees and 94 degrees west longitude. The Mississippi river splits it in twain, with far the larger portion, about 37,000 square miles, upon its western banks. Exclusive of lakes and bays, it has 45,440 square miles of territory, of which about 20,000 are of alluvial origin and the rest are uplands of varying character. In north Louisiana the hills attain to the height of 500 feet, and from this height may be found every altitude, until we reach the sky-skirting prairies of the southwest, where the general topography is only 30 to 50 feet above the sea level.

## CLIMATE.

Its proximity to the gulf of Mexico secures a prevalence of southern winds, cool and moisture laden, which mitigate the extremes of weather, experienced by states to the north. Though our summers are prolonged, the heat is never oppressive, the thermometer rarely reaching 95 degrees. In carefully kept records of the three experiment stations for the past eight years, 98 degrees has been the highest recorded temperature at New Orleans, 99 degrees at Baton Rouge and 100 degrees at Calhoun, in the extreme northern portion of the state. These maximums have been rarely reached, not oftener than one or two days in a summer. The winters are usually mild, with an average temperature of about 53 degrees in the southern, and about 45 degrees in the northern part of the state. Occasionally the tail-end of a northwest blizzard, which has spent its greatest violence in more northern regions, reaches this state and remains for a few days to destroy tender vegetation and chill its inhabitants. These visits are not frequent, rarely occurring more than once or twice in a season. They are, however, so destructive as to force the culture of tropical fruit (oranges, etc.) to the immediate section bordering on the gulf. In 1886, during the prevalence of one of these blizzards, the temperature at New Orleans fell to 17 degrees Fahrenheit, the lowest ever known. Since that time 20 degrees has been the minimum attained. But for these occasional blizzards tropical fruits could be grown over most of the state and ordinary summer vegetables raised the year round.

## RAINFALL.

The average yearly rainfall at New Orleans is about 70 inches, decreasing in quantity as one goes northward, with 45 inches as an average in the extreme northern portion. The heaviest showers fall in summer during the growing season. Winter comes next in its quantity of rainfall, while our springs and autumns are our dry seasons, with only occasional showers. Such seasons are conducive to the welfare of our staple crops, cotton, sugar cane and rice; dry springs, permitting a successful planting and cultivation of these crops and dry autumns,

so essential to the rapid and economical harvesting of them. Our regular rains are from the southwest; yet in summer they sometimes come from the northwest, and when they do, they are usually accompanied by thunder and lightning.

The climate of the entire state, from October till May, is an ideal one, attractive alike to the invalid and tourist, and thousands of visitors from the north are yearly seeking this state in quest of health or enjoyment. The hotels of New Orleans furnish attractive homes for the opulent and fashionable, while men of moderate means can find cheap, and excellent homes in the smaller hostels and private boarding-houses of this city, in the towns and villages scattered over this state and along the gulf coast of Mississippi.

#### GEOLOGICAL FEATURES.

An erroneous impression generally prevails that Louisiana is wholly alluvial—a low-lying swamp which has to be reclaimed, drained and leveled to make inhabitable. An examination of the figures given above refutes in unmistakable terms this error. Not only the larger area of the state is upland and above any possible flood, but a slight majority of the population of the state, outside of the city of New Orleans, reside on these uplands. To this portion of the state belongs nearly seven-tenths of her rural white population.

#### GEOLOGICALLY

speaking, Louisiana is a very young state. It had no existence at the end of the paleozoic age. Only a few closing chapters of the world's history are here recorded, and these have been written by water, which is now, as ever, the great factor in landmaking in this state.

#### CRETACEOUS.

A small portion of cretaceous strata, consisting of hard limestones, gypsum, salt, sulphur and marls, have been laid down at the close of the mesozoic age of our earth at the bottom of a deep but gradually shallowing sea, extending from Arkansas into northwestern Louisiana, and on in a southeasterly direction through the state to Avery's Island (salt works), which rises out of the salt marshes of the gulf of Mexico. This geological period is found now only in isolated spots, ancient peaks of this ridge, former cretaceous islands in a tertiary sea. Outcrops of this period are found in Bienville, Winn, Rapides, St. Landry and other parishes, but no prominent topographical features are given to the country by its presence. It forms the backbone of this state, and upon it and against it are deposited the debris of subsequent ages. In many instances it is revealed only by the well-diggers' spade, bringing up fragments of crystalline limestone and gypsum. These strata are nearly always accompanied by salt, and the old salt works of Webster, Bienville, Winn and Rapides parishes are along this ancient ridge. In Winn and St. Landry parishes occur marble quarries, large bluffs of hard horizontally banded crystalline, cretaceous limestone, nearly 60 feet in height. Such cretaceous outcrops are the oldest lands in Louisiana, and have perhaps remained ever since as dry land, unaltered by subsequent geological changes. Frequently the overlying tertiary and quaternary deposits have been removed by the force of water,

exposing areas of 40 to 60 acres in extent, usually along the courses of the smaller streams. These exposures are bare of vegetation and covered with an efflorescence of salt, forming the licks of this country. In these exposures shallow wells were sunk, and from their saturated brine, standing nearly or quite up to the surface, large quantities of salt were manufactured during the late war. Drake's, Rayborn's, King's, Price's, and other salt works extensively operated during the war were located on these outcrops. Since the war, on Petit Anse (Avery's) island, in the extreme southern portion of the state, situated on this same ridge, has been found enormous deposits of nearly pure salt. These mines have been for years extensively worked, and the present output gives no sign of exhaustion.

It is inferred from borings and exposures that this cretaceous ridge is a narrow one, with occasional high promontories. Its sides are steep, and in many instances, almost perpendicular. Wells of considerable depth have been dug in close proximity to this ridge without striking this foundation. An artesian well at Shreveport, 1100 feet deep, has furnished a water, strongly impregnated with salt, and it is thought that this water is furnished by the upper cretaceous sands. Again, at Sulphur City, twelve miles west of Lake Charles, in Calcasieu parish, the sulphur mines occur, at (circa), 500 feet below the surface, another revelation of this formation. These borings prove a west, or southwest, dip of this foundation.

In the history of our earth the cretaceous deposits represent the close of the middle, or mesozoic, age. The limestones, marls and sands of this period contain the first record of modern life on our globe, mingled side by side with the forms of past ages, now fast disappearing. These cretaceous deposits are found all along the Atlantic coast from New Jersey, through Delaware, Maryland, Virginia, North and South Carolina and Georgia. In these states their course is nearly parallel with the Atlantic coast, but on reaching Alabama they change direction to the west, and spread out into a wide belt, forming the famous prairies and cane brakes of this state. Entering Mississippi, they assume a northerly direction, and give to that state her famous lime processes. From Mississippi they invade Tennessee, as far north as the mouth of the Ohio river. Beginning again in the trans-Mississippi region, in Louisiana, they pass through Arkansas and Texas, and tending northward, occupy almost the entire plains and prairies along the Pacific.

This formation serves in Louisiana as the axis, against which subsequent geological deposits were made, and, agriculturally, is of no value, owing to small areas exposed. But on this formation have been found the extensive salt and sulphur deposits of the state, and on account of the future relation of these articles to the wealth of this country. It is of great economical importance.

Prof. Hilyard, on reporting to the New Orleans Academy of Science the results of his reconnaissance, has this to say relative to the salt mines of Avery's Island, and the sulphur beds of Calcasieu:

"In view of the grand scale upon which the conversion of ocean into land occurred towards the close of the cretaceous period, as exemplified by the magnitude

of the gypsum bed, it is probable that the original extent of the rock salt bed was correspondingly great, and that, however it may have been encroached upon by solution and erosion during the tertiary and quaternary periods, it will still be found of sufficient thickness and accessibility for exploitation at numerous points outside of Petite Anse."

The same probabilities hold good, though in a much more restricted sense, of the Calcasieu sulphur bed. The obvious fact that the drift currents have encroached heavily upon both deposits, renders the determination of their occurrence in particular localities a matter of considerable difficulty and delicacy.

It is, therefore, highly probable that similar deposits of salt, gypsum and sulphur to those now known may be discovered in the near future.

### THE TERTIARY FORMATIONS.

At the close of the mesozoic age powerful forces produced an upheaval of this cretaceous ridge, causing many fractures and folds, and gave to Louisiana an outline of its future drainage channels. This ridge, trending diagonally across the state, formed two immense shallow basins, the Red on the west and the Mississippi on the east. Into these shallow waters were deposited the sand and shales of lignites of the early

#### EOCENE.

In Louisiana this is known as the "lower lignitic," since lignite and lignitic clays abound. In DeSoto and Sabine parishes beds of lignite occur in many places. The country underlain by this formation covers nearly the entire northwestern portion of the state, but while this geological formation underlies this entire section, it rarely reaches the surface, and, therefore, takes little or no part in soil formation. The soils here, as in other parts of the state, are being formed from the yellow, sandy clays and drift sands of the quaternary age, deposited after the state had definite form and shape. But this section is to be emphasized by virtue of a large amount of lignite which it contains. On the Sabine river an outcrop of 14 feet in thickness is reported in the banks. Nine miles southwest of Mansfield a lignite seam 31-2 feet thick forms the bed and bank of the stream. The coal preserves its woody structure, is glossy and very firm. Mixed with charcoal, it is used by local blacksmiths with success. This coal contains, by analysis, 5.94 per cent ash, 38.93 per cent fixed carbon, 38.52 per cent volatile matter, and 16.61 per cent moisture. It has also 1.94 per cent sulphur.

#### MARINE CLAIBORNE.

The deposits of this group are resting directly and conformably upon the lower lignitic. North of the Vicksburg, Shreveport and Pacific Railroad these deposits along their western boundary trend northwest. South of this railroad their course is nearly due south. The eastern boundary of this group passes through Gibbsland, in Bienville parish. This formation runs as far south as Alexandria, where it is crossed by the sands of the grand gulf group. This formation nowhere reaches the surface, and therefore, takes no part in the formation of the soils, but it is characterized by the presence of marls and glauconite, which can, under proper conditions, be

utilized as valuable amendments to soil fertility.

#### UPPER LIGNITIC.

The eastern portion of the hills of north Louisiana are underlain by this formation, which rests conformably upon the Claiborne sands and clays. In lithological material and physical structure this group is strangely similar to the lower lignitic, from which it is separated by the marine Claiborne. Beds of lignite occur also in this formation, but they are rarer and not so thick as in the lower lignitic.

While the above groups were being deposited, the dry land was slowly emerging from the gulf and the rivers and creeks were sculpturing a landscape similar in topographical features to that presented to-day. But here the scene changes and a slow submergence takes place. Muddy shallow seas prevail and a heavy deposit of gray clay is placed over all the hills of north Louisiana. These clays are called by Dr. Lerch

#### ARCADIA CLAYS.

"They cross the state from east to west, resting upon the deeply eroded surface of the lower lignitic, marine Claiborne and upper lignitic formations, reaching northward into Arkansas, westward into Texas and eastward to the flood-planes of the Mississippi and southward to the calcareous marls and limestones of the overlying Jackson and Vicksburg groups." They are of the highest economic importance, since they form the water-carrying beds for the springs and wells of north Louisiana, and enter largely into the composition of the soils of the creek bottoms. The water coming from them is remarkably pure, while the soils made from them are cold, tenacious and hard to drain. When mixed with the sands and sandy clays of the surrounding hills, they give soils of fair fertility and susceptible of great improvement. In Bossier and Webster parishes they constitute the soils of the large flats which characterize this section of the state. These clays can be used for pottery and, when properly mixed with sand, make good brick and fire clay.

#### THE JACKSON AND VICKSBURG GROUPS.

have not been clearly separated in this state. They occur, resting conformably upon the Arcadia clays, in the southern portion of the hills of north Louisiana, and constitute the "black prairies" of this section. They run in a band about thirty miles wide across the state. From the preliminary report upon the hills of Louisiana, made by Dr. Lerch, under the auspices of the experimental station, and published as Part II, Geology and Agriculture, the following is extracted:

#### JACKSON GROUP.

They are of high economic importance, not alone on account of the lithological material they consist of, but especially on account of their position. They enter and frequently make up the soils of a vast extent of country solely, cause an entirely different vegetation, of which hawthorns, persimmons, black haw and crab apples are especially characteristic, and are the cause of the black bald prairies frequently mentioned. The soils derived from this formation are generally

very fertile, though not easily worked. In the territory they occupy they frequently protrude through the thick cover of red, sandy clay and drift, island-like, conspicuous through the break in the vegetation, as well as through their lithological material, mostly indurated yellow marls gradating downward into calcareous gray clays, especially exposed along their northern boundary line. Frequently white and yellow limestone bowlders are scattered promiscuously over the outcrops, more rarely limestone ledges a few feet in thickness are found capping the hills. Zeuglodon bones have been found on the edge of the parishes, the most characteristic fossil of the Jackson of Mississippi. The outcrops of the lower series are found frequently on a level with the Jackson beds, on account of the deep erosion they have sustained before these strata were deposited upon them.

#### THE VICKSBURG GROUP.

If it were not for the paleontological evidence found in these strata, marking a different geological horizon, they hardly could be distinguished from the underlying Jackson beds. Perfectly conformable, they rest upon them, and no change in the topography of the territory they occupy, nor in the vegetation growing upon their line of outcrops, marks a new geological subdivision. With the underlying beds they have the bald prairies and the lithological material in common. They mostly consist of "yellow calcareous fossiliferous marls," are similar, if not identical, in composition, with that of the Jackson group. The waters found in the region are like those carried by the underlying formation, of bad quality, and the soils possess the same qualities, like those of the former group. In a narrow band, their northern boundary very irregular, though subparallel to the northern boundary of the Jackson beds, they cross the state from west to east, with a south boundary coinciding with the boundary of the grand gulf rocks, beneath which formation they disappear. Their outcrops are frequently marked by the drift, appearing only in isolated spots in the sandy sheet. They are of the same economic importance as the Jackson strata.

#### THE GRAND GULF ROCKS.

This formation, though the poorest of all described, is of the highest economic importance to Louisiana on account of the immense territory it occupies and the influence it has on other regions of the state. Along the south boundary line of the Vicksburg marls the sandstones and claystones and massive clays of the grand gulf group overlap them, and in a line of hills and bluffs cross the state from west to east, dipping southward, but under a far steeper angle than the underlying formations. Examining its northern boundary line and advancing in a southerly direction, we notice a rapid thickening of the strata and soon lose all sight of the contact of the underlying formation, notwithstanding the hills and bluffs are steep, not infrequently rising along this boundary line over 150 feet above the country drainage. More than any of the previous regions described, it has the plain structure preserved, though erosion has chiseled out different forms. Instead of the well rounded hills and more gentle slopes of the ridges occupying the region north of its boundary, it slopes from its deeply dentated and

broken north line southward under a steep angle, rapidly towards the gulf, presenting a plateau in which the rivers have cut wide valleys with steep walls, and their tributaries, narrow gulleys with broken and dentated embankments, several over 100 feet in height. Frequently the country roads wind along a narrow ridge, falling steep to either side for many miles through this section. The features of erosion resemble somewhat the country north of it, where the drift-sands have accumulated, forming sections almost equally steep. They lessen in height in a southerly direction. The landscape these rocks offer is very monotonous. The open woods of the long-leaf pine, as far as the eye can reach, and the green turf, interrupted by bare spots of the gray sands, derived from the underlying sandstones, sometimes cropping out in high knolls along the road, or from the sands and gravels of the drift which generally cover the rocks of this formation in a thin sheet. The waters of streams and creeks are swift, rich in fish, especially trout and perch, and almost of crystalline clearness, unless they wind along a swampy bottom, and springs are even more numerous than in the northern part of the state.

#### THE RED SANDY CLAYS.

The strata of this formation, deposited at the close of the tertiary in Louisiana, cover all the territory north of the Vicksburg, Shreveport and Pacific Railroad, and can be traced, though frequently interrupted by drift material and outcrops of the underlying formation, almost to the north boundary of the grand gulf rocks. They cover the eroded surfaces of the gray clays, the Jackson and Vicksburg rocks, and sometimes even mantle the outcrops of the laminated clays and sands of the lower series of tertiary rocks. To a large extent, the soils of the region they occupy are directly derived from them, sometimes they enter into their composition, with the drift and, mixed with the clay of older formations, they form the bottom soils and the covering loam-sheet of the diluvial flats. There can be but little doubt as to the circumstances under which they have been deposited. Throughout their deposits they show the fluviated structure. To judge from their geographical distribution in this state, it seems that the sandstones of the grand gulf rocks formed their southern shore and that the shallow basin deepened towards the north, having a connection with the gulf through the wide Mississippi valley. Everywhere the formation is largely denuded and their outcrops can be seen in great abundance in the territory they occupy. They consist generally of highly ferruginous sandy clays, mottled and streaked and sometimes studded with pebbles derived from the underlying gray clays forming lines of stratification. The irregularity of these lines which show so clearly their process of deposition have been mentioned before. Ferruginous sandstones and claystones, which frequently cap the hills north of the Vicksburg, Shreveport and Pacific Railroad, are seldom found south of that line, and with the exception of a few localities in the Dolet hills none were seen. The fossil wood, however, remains to be a characteristic feature of this formation, and like in the northern lo-



calities, it is found south of the railroad in great abundance, generally on the contact of the red sandy clays and underlying formations. Ferruginous fossils are frequently found, often associated with phosphatic nodules in ferruginous claystones. Occupying more than one-half of north Louisiana, they impart to the country largely its characteristic topography and vegetation. The hills of the territory they underlie are caused by erosion in this formation, though foreshadowed in the older tertiary strata and the short-leaf pine, oak varieties and

gums and hickory grow most luxuriantly on soils derived from it. In the central part they almost solely make up the surface material, in the western, eastern and southern parts they are more or less marked by the sands and gravels of the drift and by diluvial loam deposits along the larger river courses. The country in which their deposits predominate is easily tilled, and by far richer than any of the other regions of north Louisiana, with the exception of the alluvial bottoms of rivers and creeks, and the black prairies.

## The Sands and Gravels of the Drift.

Not alone one of the most interesting formations from a scientific point of view, but also of the highest economic interest, especially on account of its stratigraphical position, forming the covering mantle over all that is beneath. Its sands spread in a thin sheet over the northern portion of Louisiana, forming immense deposits centrally from west to east, and thinning out and spreading again, sheet-like, over the grand gulf rocks. Two gravel streams, many miles in extent, accompany the diluvial valleys of the Red river and Ouachita (Mississippi) river to join about fifty miles south of the Vicksburg, Shreveport and Pacific Railroad, and to spread from there over the whole territory. Its sands are a component part of all the soils of the region. The alluvium along the present river courses, the loam sheets of ancient river bottoms and recent swamps, the soils of the hilly uplands, all with the exception of the red lands, centrally located from north to south, from which recent erosion has removed them, are partly derived from these deposits. The well waters are cleared and filtered by them, especially in sections where these sands have reached sufficient thickness, all certainly features which make them worthy of our consideration. Wherever they are exposed they show stratification lines like in the underlying formation of irregularity, however not nearly as irregular as found in those deposits. In their lower portions they graduate into the underlying red sandy clays which are some times found re-stratified in the drift, though generally the contact line of both these formations is well and sharply defined. Their direction is from north to south, and their stratification and material (well-rounded gray and ferruginous quartz sands and gravels) leave no doubt that they were deposited in waters flowing in a generally

southerly direction. Silicified corals, favosites and cyathophillum have been found among the gravels north of Alexandria. Mostly they consist of quartz varieties and hard silicious sandstone pebbles, and on reaching the grand gulf rocks they are mixed with boulders derived from this formation. A few granite boulders have been found, and also worn. They consist of a gray granite, with black mica and hornblende; and also several smaller pieces of gray and flesh-colored granite. The sands consist generally of almost pure quartz grains, well rounded, and then again of deep, loose red-colored quartz sands, the grain being coated with peroxide of iron. In the northern portion of the formation conglomerates have been found in extensive layers, consisting of the pebbles of the drift imbedded in an iron matrix, due to a process of lixiviation of overlying sands.

There can be no doubt that these sands and gravels represent the southern drift. Probably the glaciers reached to their northern boundary and the waters arising beneath them carried the sands and gravels, spreading them over the southern territory. The uniformity and thickness of the gravel deposits show that currents of greater force, likely derived from the main glaciers, rolled them southward to the drainage channels of the country, preceding the glacial period, were filled with the sands washed out from the northern moaines till they seem to have covered north Louisiana completely, with the two larger currents, the Red river and Mississippi river, west and east. When finally the streams derived from the subsiding ice sheets ceased to furnish new material, a large amount of the gravels and sands were removed to the sea, and the narrowing rivers, still of enormous size and lake-like appearance, deposited at their bottoms gradually the fine mud, forming now the loam sheets of our upland flats, skirted with the pebbles of former more violent floods.

COAST FORMATION.

In the extreme southeastern and in the extreme southwestern portions of this state, including a part of the parishes of St. Tammany, Tangipahoa and Livingston in the east and Calcasieu in the west, occur low "pine flats," or "meadows," the exact geological position of which is not yet fully determined. Field examinations are now being made, with a view of throwing some light on this subject. This formation may be anterior to the "blue clay" (Champlain) period, or coincident with it. The entire country is covered with small, scattered long-leaf piles. Most of it is covered with "orange sand," which overlies a partly marine and partly fresh water formation, consisting mainly of gray, mossy clays, which gives the impervious stratum to which these "pine flats" owe their peculiar features. To the eastward they extend beneath the littoral alluvium of lakes Maurepas, Pontchartrain and Borgne, and perhaps form the clay bottoms of these lakes beyond the sand and clay deposited by the tides and streams running into them. This formation is found along the entire Mississippi coast, and is reached at moderate depths in many of the wells, rendering the water therefrom undrinkable. In the west, in Calcasieu parish, it is covered on the south by the silty prairie, a subsequent formation, as explained above.

THE BLUE CLAY, LOESS AND BLUFF.

may together be classified as the Champlain formation. Strictly speaking, all of the soils of the large bottoms of this state are not alluvial. The rivers have cut their way through a thick deposit made long be

fore the existence of our present channels. From Memphis and Shreveport to the gulf the entire bottoms are underlain by a stiff clay of variable depths, through which the present rivers have carved their channels. This deposit was made at a time when the entire valleys were depressed below their present levels and were stagnant, continuous swamps. By subsequent elevation sufficient fall was given to produce currents strong enough to establish channels, through which the rivers have been ever since emptying their floods. Upon this clay (blue in the Mississippi bottoms) these rivers have ever since been depositing their alluvium. Frequently, however, large areas are found still uncovered, and when cultivated give us their famous "buckshot" soils. These buckshot clays are the lowest strata of the Champlain formation, whose higher ones give us the "loess" and "bluff" of the cane hills on both sides of the Mississippi and of the southwestern prairies.

The bluff region in this state is underlain by a calcareous silt belonging to the loess formation, and this in turn is overlaid by a rich brown loam, the lime bluff formation varying in thickness from a few inches to 8 or 10 feet. At Port Hudson these formations are together well exposed, superimposed the one above the other. At the foot of the bluff occurs dark-colored clays, with calcareous and ferruginous concretions, fossil wood, stumps, cypress knees, etc. From these clays the buckshot soils already mentioned are derived. Above these clays occur the calcareous silts of the loess, while nearer the surface are 7 feet or more of brown loam, the thin surface soil of the bluff formation.

The following condensed table will give the geological ages and groups found in Louisiana and the material and fossils of each:

GEOLOGY OF LOUISIANA.

AGE	NAME OF GROUP	CHIEF MATERIALS.	KIND OF FOSSILS FOUND.
QUATERNARY.	Alluvium.	Soils.	Living plants and animals.
	Second bottoms.	Soils.	Living plants and animals.
	Bluff lands.	Brown loams.	
	Loess.	Calcareous silts.	
	Blue Clay.	Clays.	
	Drift.	Sands, pebbles, etc.	Living shells and trees.
TERTIARY.	Yellow sandy clays.	Sands, loams and clay.	Living shells and trees.
	Coast formation.	Sands and clay.	Living shells and trees.
	Grand Gulf group.	Light clays and white sandstones.	Plants partly extinct.
	Vicksburg group.	Marls and limestone.	Marine animals.
	Jackson's group.	Marls and limestone.	Marine animals.
	Arcadia clays.	Gray clays.	No fossils.
CRETACEOUS.	Upper Lignitic.	Dark-colored clays.	Plants—Lignite.
	Claiborne	Marls.	Marine animals.
	Lower Lignitic.	Dark-colored clays.	Plants—Lignite.
	Ripley.	Marls and limestone.	Marine animals.

Only three of the principal geological periods are here represented, and one of these by its uppermost group, with only an occasional outcrop.

While all of these groups are represented in Louisiana very few of them occupy excessive surface development, and therefore take but little part in the formation of soils.

## Extent of These Formations.

Beginning in the southern part of the state one finds the coast marshes, consisting of the blue clay of the Champlain period, upon which the mud and clay, brought in by modern floods and tides, have been deposited. They are now in the process of formation and are overflowed daily by the tides. Near the bayous and rivers the alluvium brought down by the floods has been piled upon this clay, elevating the adjacent surfaces above the level of the marshes and making arable land. By leveeing against high waters these lands have become the permanent abode of a prosperous population engaged in cultivating the soil. Throughout this territory (sea marshes) live oak ridges are found, which were reserved until recently from sale or pre-emption. The timber from these ridges was formerly used by the government in building its ships. In modern times iron ships have supplanted wooden ones, and accordingly these ridges are now subject to the same laws as apply to other public lands. Much of these coast marshes that are now covered with reeds and grasses are susceptible of reclamation. Dikes similar to those constructed in Holland for the reclamation of the land from the Zuyder Zee could be built here and thousands of acres of extremely fertile lands could be placed under cultivation. This, to a limited extent, has already been accomplished in southwest Louisiana. (See Mr. Watkins' letter further on.) Recent contracts, involving the modest sum of \$35,000,000, have been made for further land reclamation in Holland. Similar sums spent here would reclaim much larger and more fertile areas.

### BLUFF LANDS.

Above this blue clay occur the calcareous silts and brown loams, brought down by streams which antedate those which exist at the present time. After the deposition of this clay in a sluggish, shallow sea, running well up to Cairo, Ill., a gradual elevation took place, and this bottom became the outlet for the great volume of water falling between the Appalachian and Rocky mountains. This ancient, enormous river extended from the present bayou Macon on the west to Vicksburg on the east. It had, like our present Mississippi, its high waters and overflows. The current was, however, not so great, and hence its deposits were of a silty or loaming character. These deposits continued until both sides of this great stream were walled in by high bluffs ten to fifteen miles

wide. From Vicksburg, Miss., to Baton Rouge, La., on the eastern banks, these bluffs are continuous. At the latter place they swerve to the left and are soon lost against the older formations. On the western side these bluffs have been partially destroyed, but enough remains to trace the exact position in former times. Upon the western banks of bayou Macon may now be plainly discerned the bluff formation constituting what are known as bayou Macon hills. These bluffs follow this stream through West Carroll, Richland and Franklin. They constitute a large part of Sicily island. At the southern extremity of this island their continuity has been broken by the waters of the Ouachita and Boeuf rivers. From Harrisonburg, in Catahoula parish, they may be traced by occasional outcrops through Rapides, Avoyelles, St. Landry, Lafayette, Iberia and St. Mary parishes. The five islands jutting out of the sea marshes are of this formation and give unmistakable evidence that the western mouth of this great inland stream was near Belle island. The hills of Opelousas, Grande Coteau, Carencro and Cote Gele are remains of these bluffs. The western banks of this ancient stream have been almost destroyed by water. Between the Ouachita and bayou Macon they have been spread out over nearly the entire country, forming some of the best lands of the state. Jefferson and Mer Rouge prairies of Morehouse, Holloway of Rapides and Marksville of Avoyelles have all originated from disintegrated materials of this ancient ridge. But the largest results from this disintegration is to be found in the parishes of west Louisiana. They extend from Franklin, St. Mary parish, on the east to the Texas line on the west, and from the coast marshes of the south to near the extreme northern limit of St. Landry parish. This entire prairie has been reclaimed from the salt marshes by the deposition of the material derived from the western bluffs of this ancient stream. The area of this bluff formation is therefore quite large in this state.

### STRATIFIED DRIFT.

North of the pine flats and participating in the general southward dip of the formations of the state, occur, at or near the surface, beds of sand or gravel of the stratified drift. This formation is found on the tops of the hills of the State as well as below the blue clay of the Mississippi river. It is the presence of these sands or gravels which cause so much trouble with caving banks along this stream. The channel of the river has cut its

way through the blue clay into these sands or gravels. At high water the velocity of this stream is considerably augmented and, therefore, the increased erosive force of its waters wear away these underlying sands and gravels and leave the superimposed clay stratum undisturbed, which, when the flood recedes, unsupported by the buoyancy of water, yields to the force of gravity and falls into the river, giving, in many instances, disastrous caves. The gravel of this formation is found overlying the salt beds of Avery Island and underlying the bluff strata. This is its most southern exposure. Rising as one proceeds northward, it becomes more or less abundant throughout all of the uplands of the State.

#### GRAND GULF GROUP.

North of the sands or gravels which border the pine flats and prairies of this State occur the grand gulf formation. Rising in height northward, the clays and sandstones of this formation form a prominent hilly belt, running across the State through the parishes of Vernon, Sabine, Natchitoches, Grant and Catahoula, terminating in the last parish at Sicily island. Long-leaf pine mark the boundaries of this section, as well as a similar section in eastern Louisiana.

#### VICKSBURG AND JACKSON GROUPS.

North, and parallel with the transverse ridge just described in the parishes of Vernon, Sabine, Natchitoches, Grant, Winn, Catahoula and Caldwell, occurs a narrow belt, within which the calcareous marls and limestones of these groups approach the surface, giving occasional calcareous prairies. It terminates in the high bluffs on the Ouachita River, at Columbia, Caldwell parish. This belt is about thirty miles wide.

So far these strata appear to have a general southward dip, but north of this

prairie the stratification conforms to the calcareous ridge, or backbone, already described and which originally determined the divide between the Red and Ouachita rivers. In northwestern Louisiana, covering the parishes of Caddo, De Soto, and parts of Bienville, Bossier and Sabine, occur

#### THE LOWER LIGNITIC

rocks, rising conformably against this cretaceous ridge. In this section are the most prominent lignite beds of the State. Against this is superimposed the Marine Claiborne, which occupy portions of Bossier, Claiborne, Webster, Bienville and Natchitoches. Here the calcareous and green sand marls abound, which, under proper conditions, may be advantageously used as fertilizers.

#### THE UPPER LIGNITIC

is found underlying the parishes of Claiborne, Union, Bienville, Jackson, Lincoln and parts of Morehouse, Ouachita and Caldwell.

Superimposed over these last three formations, stretching over the entire hill portion of North Louisiana, is the formation known locally as

#### THE ARCADIA CLAYS.

In Webster and Bossier it has the largest surface exposure, forming the soils of the flats of these parishes. It is also fully developed in every creek bottom in this section.

But while these formations underlie the sections given, the surface exposures are of limited areas, taking but little part in the formation of soils. Nearly the entire upland of the state has for its surface covering the stratified drift already mentioned or the red, sandy clays. The latter constitutes the chief material of the soils of the hills of north Louisiana, and as such obscures, except in ravines and cuts, the geological formations given.

## RIVERS AND WATER COURSES.

No state in the union has so much alluvial lands or so many miles of navigable waters. The widest part of the flood plain, as well as the delta of the Mississippi river, lies within its border. The alluvial and marsh lands derivable from this river are over 13,000 square miles. The bottoms of the Red, and its tributaries before it enters this valley, about 1700, the marsh lands west of the delta about 4000, other alluvial and swamp lands about 600 square miles, making in the aggregate a little over 19,000 square miles of alluvial land, or nearly one-half of the state.

The Mississippi and the Red are the chief drainage channels of the state, and almost all of the larger streams of these basins diverge from them, and hence, are

called bayous. Before the days of levees they formed so many channels, or outlets for the escape of water in floods. Such a network of connections has thus been formed that it is now difficult sometimes to trace the course of an individual stream. As a rule, some large bayou flows along the edge of the bottom plain. Bayou Macon is on the west of the Mississippi flood plain, Ouachita river on the extreme west of the central plain, bayous Boeuf, Cocodrie and Teche on the west of the flood plain of the Red river. In north Louisiana the rivers follow the trend of the subterranean rocks. In the east they flow southeasterly in the Ouachita and southward into the Red. In the extreme south these west of Mississippi flow southward into the gulf; those east, southeast, into the lakes.



## Agricultural Divisions of the State.



The state may be divided agriculturally into five parts: First, alluvial region; second, bluff soils; third, good uplands; fourth, long-leaf pine region; fifth, central prairie region.

### FIRST ALLUVIAL REGION.

This region may be conveniently subdivided into three parts:

First—Alluvial of Mississippi river and its outlying bayous.

Second—Alluvial of Red river and its outlying bayous.

Third—The marshes of the coast and lakes.

As before remarked, this region occupies about 19,000 square miles, and its vast possibilities in the near future for supporting millions of beings are simply inconceivable. The lands of this section are now leveed against the annual encroaching floods of the rivers which traverse them. Several millions of dollars are annually spent in enlarging and strengthening these protecting earth walls. When these streams, as they will be in a few years, shall be safely controlled in their annual rises and the confidence of the people established in the ability of levees to thoroughly protect, then will a full appreciation of the intrinsic merits of these lands be realized and high values be established.

Dr. Hilgard speaks of this region as "the most fertile agricultural lands of the state, equaled by few and surpassed by none in the world in productive capacity."

### ALLUVIAL REGION OF THE MISSISSIPPI RIVER AND ITS OUTLYING BAYOUS.

The parishes of this region north of the mouth of Red river are East Carroll, Madison, Tensas and Concordia entirely and parts of Morehouse, Ouachita, Union, West Carroll, Richland, Franklin, Caldwell and Catahoula. South of the mouth of Red river the whole of the following parishes are included in this region: Pointe Coupee, West Baton Rouge, Iberville, Ascension, Assumption, St. James, St. John, St. Charles, Jefferson, Orleans, St. Bernard, Plaquemines, Lafourche and Terrebonne. Parts of Avoyelles, West Feliciana and East Baton Rouge are also alluvial. In treating of the soils of this region it would be best, perhaps, to adopt the local custom and call all of that portion north of the mouth of Red river north Louisiana and all south of it south Louisiana. This should be done also

from an agricultural standpoint, since the soils of the northern section are of a lighter, sandier character than those of the southern section. Cotton is the chief crop in the former, while sugar cane dominates among crops in the latter.

### ALLUVIAL LANDS OF MISSISSIPPI RIVER IN NORTH LOUISIANA.

Crossing the state from the Mississippi river westward along the Arkansas line, one encounters alluvial bottoms separated by spurs of hill land running down from Arkansas, until the hills west of the Ouachita are encountered. Bayous Macon and Tiger are encountered after a journey over alluvial bottoms of eight miles from the river. Westward of these bayous begin the bayou Macon hills (bluff formation), which are here about eight miles wide. They extend in a widening belt to the southward eighty-five miles, terminating in Sicily Island. Their widest extent occurs just north of Winnsboro, in Franklin parish, and is here nearly twenty-five miles.

Descending from these hills, going westward along the Arkansas line, the valley of the Boeuf river is entered. This extremely fertile valley is here also about eight miles wide and extends southward, with about the same width until it merges into the valley of the Ouachita river, eighty miles distant.

Westward of the Boeuf river "alluvials" we encounter a true ridge of the tertiary formation stretching out from Arkansas well down into Louisiana, and cut off at some remote day from the main hills by the Ouachita river and its tributaries.

This ridge has been intersected by bayou Bartholomew (which empties into the Ouachita), leaving a narrow tongue between it and its confluent. This ridge varies in width from four to thirty-five miles, and is known locally as Bastrop hills, the town of Bastrop, the county seat of Morehouse parish, being situated thereon.

The Ouachita river forms the western boundary of the flood plain of the Mississippi valley and borders the hill country (good uplands) of Union, Ouachita, Caldwell and Catahoula parishes. Along this river and its tributaries, bayous d'Arbonne, De Siard and Bartholomew, some of the finest cotton plantations of the state are situated. These alluvial lands are in many respects most desirable, since their easy culture, profuse fertility and absence of levees (the upper Ouachita being above the highest overflow) all conspire to give profitable returns under good culture and management. The tertiary ridges mentioned above are similar to the good uplands

described elsewhere. There are some "prairies" scattered through these ridges, with soils varying from pure sand to whitish clays. In Ashley county, Ark., similar prairies, with the latter soils, have, by drainage and tillage, been made highly profitable.

Seymour's and Dubull's in northern Morehouse, and Prairie au Bois, in southern Ouachita, are of sufficient size to merit a distinct coloring on the agricultural map of the state. Prairies Mer Rouge and Jefferson lie at the eastern foot of the ridge in Morehouse parish. They are extremely fertile tracts of a few thousand acres each, and properly belong to the "buff formation." The name of the former, Mer Rouge (Red sea), is derived from the prevalence of a sumac (*Rhus copallina*), whose berries in autumn are brilliantly red. This shrub and a few hawthorn are the only tree growth on these prairies.

Descending the western banks of the Mississippi river from the Arkansas line to the gulf, no uplands are found, and the entire country adjacent is wholly alluvial. Levees constructed and maintained at public expense extend this entire distance, and protect the lands from overflow in high water. Examination will show that the highest lands of this alluvial region are immediately on the banks of the river. This is true of every stream that overflows its banks in high water. It is accompanied throughout its course by a ridge, the resultant of the debris deposited by it in each successive overflow. From this ridge the lands slope gently to a low-lying cypress swamp, which is usually the drainage basin between the two streams.

The bank of the Mississippi river in Louisiana, opposite Vicksburg, Miss., is 8 feet above the banks of the Tensas, 20 above the Lafourche and 10 above Monroe on the banks of the Ouachita. Before the days of levees, every overflow carried the waters to these lower levels and frequently filled the entire alluvial district, even up to the banks on both streams. These floods restricted settlement on these lands in the past, but now, with our system of levees perfected, it is expected that they will be rapidly occupied.

The soil next to the river is not only the highest in elevation, but is, as a rule, the lightest, or sandiest—the amount of sand depending largely upon the size and velocity of the stream depositing it. Hence, on the Mississippi river, soils too sandy for profitable cultivation are sometimes found. These sandy or loamy front lands can easily be distinguished from the stiff back lands by the tree growth. In north Louisiana the tree growth of the front land is cottonwood, which is supplanted by the willow on similar lands in south Louisiana. As explained elsewhere, the front lands are formed of the deposits from the present river, while the back lands are the deposits from an ancient stream which antedated our present river, and one which possessed little or no current. They closely resemble the clay soils now being formed in our swamps. They are universally known in north Louisiana as "buckshot" lands, on account of the excellent quality which they possess of crumbling into small roundish fragments on drying—a property which gives them the highest agricultural value, since they combine the high fertility of clay soils

with the easy tilth of light, loamy ones. The dark, buckshot soils are esteemed for permanent, productiveness the finest soils in the world.

Analyses made of similar soils from Mississippi by Dr. Hilgard show them to contain the largest amount of plant food, and "justify the reputation of being the most productive and durable soil of the Mississippi bottoms. Unlike most other clay soils, they may be tilled at almost any time when the plow can be propelled through them, because, on drying, they crumble spontaneously into a loose mass of better tilth than many an elaborately tilled upland soil. It is of such a depth that the deepest tillage, even by the steam plow, would not reach beyond the true soil material; and its high absorptive power secures crops against injury from drought. At the same time (owing doubtless to its being traversed by innumerable fine cracks and underlaid by gravel or sand) it drains quite readily. The front lands are also highly esteemed, and but for the proximity of the "buckshot lands," with which they are compared, they would be held of the highest value. Drainage and proper tillage will always evoke from these soils the highest yields.

#### SOUTH OF RED RIVER

the scene changes. Both the crops and the landscape vary from those described. Sugar cane now becomes the chief crop, while the cultivatable soil adjacent to the banks decreases in width as we descend the river. Above the Red River all of the so-called bayous became ultimately tributaries of the Mississippi. Below Red river there is a perfect network of bayous leaving the river, outlets to the gulf for the enormous volumes of water pouring through the Mississippi in times of flood. Along these bayous lie extensive areas of arable land, cultivated in sugar cane, corn, rice, etc. Here, as well as on the banks of the Mississippi, extensive and highly improved sugar plantations, with palatial homes, large and splendidly equipped sugar-houses and well arranged laborers' quarters, are everywhere to be found. Between the bayous and back from the main river occur extensive swamps of cypress and swamp cane, the latter less abundant near the coast. The land cultivated on the river varies in breadth from one to three miles, while on the bayous it is from a few hundred yards to one or two miles. Back of the cultivated lands are the wooded swamps, into which the drainage of the plantation is sent.

Sometimes detached portions of high land, having no present reference to any of the existing streams, are found four to ten miles from the present water courses. They are usually covered with timber and in clearing, the latter is burnt, hence such clearings are usually known as "Brulees." Again small islands jut up out of the marsh and abound in swamp cane, which furnishes excellent grazing for stock in the winter. To these islands cattle were formerly sent in large numbers, and hence were called "Vacheries."

As we descend the Mississippi, the soils are less varied in character. As a rule they are less sandy and true buckshot soils are rare. The latter are probably too deep to take part in soil formation. Usually the soils of this region are di-

vided into three classes—"sandy," "mixed" and "stiff." They vary only in the proportion of clay, they contain—those with the least are called sandy, and those with the largest amount stiff. The mixed soils are intermediate in character. As a rule the sandy soils are the most esteemed, being easier tilled and drained. Their relation to heat is such that they are the last to start vegetation in the spring and the last in the fall to be affected by frosts. The converse of this is true in regard to the stiff soils. Being dark in color, they absorb heat rapidly in the spring, and thus force an early vegetation. In the fall, on account of rapid radiation of heat, they are the first to be hurt by the frost. They are difficult to drain and cultivate, and hence are not in high request. On the other hand, they usually give a sweeter cane, but a lower tonnage per acre than other soils. Mixed soils possess properties intermediate between those described, and are very valuable. It is probable that for all purposes they are the most valuable of the three. It frequently happens that all three of these soils may occur in a small field. In fact, so frequent in the immediate past have been crevasses and overflows that the entire alluvial soil of south Louisiana may be ascribed to them. The original deposits made by the river when its banks were being formed, and before the days of the levees, are rarely within the reach of the plow. Hence the diversification of soils within a small area.

Numerous analyses of soils taken throughout south Louisiana have been made, covering every variety from the sandiest to the stiffest clay, and they all show them to be rich in the essential elements of plant food, and, as a rule, require only physical amelioration (chiefly drainage and good culture) to produce excellent crops. Since all these lands slope away from the river to the swamps, they can, as a rule, be easily drained by open ditches. Tiles have also been used successfully and extensively. Their great cost have prevented their general use.

#### ALLUVIAL PARISHES NORTH OF RED RIVER—EAST CARROLL, MADISON, TENSAS AND CONCORDIA

are so nearly alike in all their characteristics as to require no separate description. They are all wholly alluvial and are bounded on the east by the Mississippi river and on the west by bayous Macon and Tensas. Tensas bayou leaves the Mississippi river in the north-eastern portion of East Carroll parish, and flows in a southwesterly direction, through Madison and Tensas, and forms a part of the western boundary of Concordia. A characteristic feature of these parishes is the presence of so many lakes, cut-offs from the Mississippi river. The banks of these lakes furnish desirable sites for homes and many a handsome building is to be found dotting the banks of lakes Providence, Palmyra, St. Joseph, Bruin and Concordia. In Madison parish fine plantations are located on the Mississippi and Tensas rivers, bayous Walnut and Roundaway. In fact, some of the best soils of the state are to be found on the smaller bayous of this section.

Tensas parish has comparatively little cypress swamps, and while most of the

plantations occupy the banks of the bayous and rivers, on account of ease of culture and transportation, there is yet a vast amount of back land occupied by a dense forest that but awaits the woodman's ax to be transformed into excellent fertile plantations. In this parish along the Tensas bayou may be found the largest development of the rich buckshot soil. Tensas claims to be the richest parish in the state and to produce the largest yield of cotton. While the latter claim may hold good in other years, yet the census of 1880 shows that East Carroll led the state in the average acre yields, averaging 95 of a bale per acre, or 451 pounds of lint. Tensas and Madison follow with '83 of a bale, or 394 pounds of lint.

Issaquena county, Miss., Chicot county, Ark., and East Carroll, La., each averaged about the same yield per acre, and at the intersection of these three states may be located the point of maximum production of cotton on the globe.

Concordia parish is almost surrounded by large streams, and, therefore, has an unusually large quantity of excellent lands. The black buckshot lands cover the interior of the parish, sandy lands being found only on the banks of the Mississippi river.

The other parishes, Ouachita, Caldwell, Morehouse, Richland, Franklin and Catahoula, are only partially alluvial and will be described under the hill and bluff parishes.

#### ALLUVIAL PARISHES SOUTH OF RED RIVER.

Immediately south of the mouth of Red river the uppermost parish in this district is situated.

Pointe Coupee is regarded by many as the most desirable parish in the state. Being on the confines of the sugar and cotton belt, with an equal capacity to grow both, one will here find what is rare in other sections—immense sugar and cotton estates contiguous.

The elegant homes and well improved plantations lying along "False river," an old cut-off of the Mississippi river, furnish pictures which for attractiveness and beauty are unexcelled in this or any other state. Besides the large amounts of cultivatable lands adjacent to the Mississippi and Atchafalaya rivers, this parish contains also considerable belts along the bayous of Moreau, Telsworth, Couteau, Cowhead, Latouche, Fisher's and Fardoche. In fact the lands along the Fardoche are not only extensive, but famous for their profuse fertility. This parish has the largest levees in the state, and they protect from overflow thirteen of the most fertile parishes of the state. Morganza and Grand levees, now solid and substantial, have been in the past the center of attraction during the flood season of at least one thousand large planters. Recently cane culture has been considerably extended in this parish.

Immediately south of Pointe Coupee are the parishes of West Baton Rouge and Iberville. Both are wholly alluvial. The former is included between the Mississippi river on the east and bayou Poydras and Grosse Tete on the west. The farming lands, cultivated chiefly in cane, are mainly along the Mississippi river, though bayous Poydras and Clause and lake Clause furnish some handsome homes and excellent plantations along their borders.

Iberville, between the Mississippi river

and bayou Grosse Tete on the east and the Grand river and the chain of lakes and bayous which separate it from St. Martin parish on the west, is one of the noted sugar parishes of the state. Nearly every bayou has habitable homes and arable lands on its banks.

Bayous Grosse Tete, Maringouin and Des Glaise furnish belts of highly productive lands, from one-half to two miles in width.

Between the above mentioned bayous extensive swamps prevail, rich in timber.

Bayou Alabama and Grand river both furnish plantations on their banks, while on the tributaries of the latter, bayous Pigeon and Sorrel, lands have been partially settled and will, when the levees prove protective, be extensively occupied by farms and plantations.

Bayou Plaquemine, the connecting link between the Mississippi and Grand rivers, now closed at the former, is a large and navigable stream, thickly dotted on its banks with well improved farms and homes. The thriving town of Plaquemine, situated at the intersection of this bayou with the Mississippi river, owes much of its prosperity to the transportation of products (now chiefly cypress lumber) on this bayou. In the southern part of this parish bayous Goula and Manufactory furnish arable lands back almost to lake Natchez, by which they are thoroughly drained. A small portion of Iberville parish is on the east bank of the Mississippi river.

Descending the Mississippi river the next parish encountered is Ascension, covering both sides of the river with its larger area on the eastern side. This is one of the leading sugar parishes of the state and contains some of the finest estates in this or any other country. Bayou Lafourche, one of the few original bayous of the Mississippi river still left unclosed, debouches from the river at this point and flows on to the gulf through the parishes of Assumption and Lafourche, furnishing along its banks some of the most fertile lands on the globe. The town of Donaldsonville, once the rival of New Orleans and Batoa Rouge, is situated at the intersection of these streams and is the county seat.

The large plantations of this parish are along the river and bayou Lafourche, but small and prosperous farms are found on the smaller bayous in the eastern portion of the parish. It is highly probable that some of the lands in the northern portion of the parish are not alluvial, but belong to the bluff formation, which here finds its southernmost extension on the eastern side of the Mississippi river.

A further descent of the river brings us to the parish of St. James, occupying also both sides of the river, with much the larger portion on the eastern, or rather here, the northern side, for at Jefferson College, in this parish, the river turns almost due east, and pursues this general direction until it has passed the city of New Orleans. The high land on the river is mainly occupied with extensive sugar plantations, and is extremely fertile. North of this land are to be found the vacheries upon which the famous Perique tobacco is grown. Here the drainage is into lake Maurepas, mainly through Des Acadians.

South of the river the cultivated border belt on the bayous is suddenly contracted by the appearance of the marsh prairies which fringe lake Des Allemands, and

extend westward in a belt of about six miles in width a little beyond the principal meridian of the public survey of this state.

### ST. JOHN THE BAPTIST

parish comes next in order, occupying both sides of the river, with the larger portion also on the northern or eastern bank of the river. It includes the whole of lake Maurepas (the upper edge of which is the northern boundary of the parish) and pass Manchac on the north, and lake Des Allemands on the south. Between these lakes and the river are to be found extensive tracts of highly productive lands, all in excellent state of cultivation. In this parish the raising of vegetables for market is quite extensively practiced, and the fields of cane and market gardens frequently alternate.

The parish or

### ST. CHARLES.

on both sides of the river, with the larger portion on the southern or western bank, though small in actual area (only 284 square miles), has comparatively a large area of fine arable lands, on both banks of the river, nearly three miles deep, which are highly improved and thickly populated.

Bayou des Allemands, which unites lakes Des Allemands and Washa, and forms the southern boundary of this parish, is also sparsely settled. Beyond this bayou is the grassy prairie Des Allemands, situated in Lafourche parish and across which the Southern Pacific has constructed its roadbed.

Jefferson parish stretches from lake Pontchartrain, on the north, to Barataria bay and the gulf, on the south. Only a small portion is north of the Mississippi river, but this small portion, together with the belt on the south side, constitutes the chief tillable land of the parish. On the higher ridges accompanying bayous Barataria, Dauphine and Des Familles may be found sugar and rice plantations, and truck gardens. The southern portion is covered with swamp, marsh prairies and sea marsh, intersected by a network of bayous and lakes—resorts of fishermen and duck hunters. Numerous shell heaps are found rising above the general levee, the remains of the clam or gnaethodon, which furnished food to a race which occupied this state long before its settlement by the French.

Bayou Barataria is navigable for small steamers and sailing vessels, and several canals (Harvey's, Company and Verret's) permit of their passage from the Mississippi river through this bayou to the gulf.

Grand Isle, a favorite pleasure resort, situated at the lower extremity of Barataria bay, is reached by a line of steamers, whose return trip is always made by this route.

Metairie ridge, running though this parish, between the river lands and lake Pontchartrain, is densely settled with market gardeners, who raise fruit and vegetables for the market of New Orleans.

### ORLEANS PARISH.

The city of New Orleans occupies nearly all of the high land in Orleans parish, and its constantly increasing population are encroaching upon the swamp lands in the rear of the city, in the rear of the city are many market gardens. This parish extends in a northeasterly direc-



tion as far as the Rigolets and includes all the lands lying between lakes Borgne and Pontchartrain. This section is traversed by the Louisville and Nashville Railroad and is almost entirely a swamp or marsh prairie, small tracts of which have been reclaimed for market gardens. Below the city in this parish are a few plantations devoted to sugar, rice and trucks. Below New Orleans on the river occur the parishes of St. Bernard and Plaquemines, the former lying wholly on the north side of the river and the latter on both sides, following it to its mouth. St. Bernard has extensive sugar plantations and market gardens on the Mississippi river and bayou Terre-aux-Boeufs. Beyond these streams the tracts of cultivatable land are few and inconspicuous. Most of the parish is marsh and is occupied by fishermen or hunters in pursuit of their game. On the gulf coast there are a number of low lying islands, which are for the most part uninhabited, save temporarily by sportsmen seeking fish or game.

#### THE PARISH OF PLAQUEMINES

has its cultivatable land lying entirely on the banks of the river. At and a little below New Orleans the belt of high cultivatable land varies from one to three miles in width, but in descending the river this belt gradually narrows, until at Forts Jackson and St. Philip the marshes encroach upon the banks of the river. Below the forts the great river pursues its way to the gulf through a narrow neck, walled in by clay banks formed from the mud lumps peculiar to the mouth of this great river. This neck is so narrow that the visiting stranger wonders that the river does not cut through it and thus shorten its route to the sea. These mud lumps have impeded navigation, checked the free flow of the waters of this river and divided its current into the several passes. Only a few settlers are found on these narrow banks below the forts, save at Port Eads, at the mouth of South pass, where the jetties have been so successfully established by Captain Eads. Port Eads is quite a village, inhabited by employes of the jetty company, which maintain the guaranteed depth of the stream; the custom-house inspector and the quarantine officer. In the upper portion of the parish some excellent sugar estates, with well-appointed sugar-houses and paternal residences, are found on the banks of the river. Lower down, orange orchards line the river, particularly on its right bank. Truck growing is also largely pursued and in no country is the product of an acre of land well cultivated of higher value. As we descend the river, the levees gradually fall in height and diminish in size until beyond the forts no artificial protection is needed.

Leaving the Mississippi river at Donaldsonville, and following the bayou Lafourche through Ascension, we reach

#### ASSUMPTION PARISH.

situated on both sides of this bayou, long famed for its sugar estates, truck farms and thrifty inhabitants. The belt of high land on both sides of bayou Lafourche is from one to one and one-half miles wide, and is very densely populated. In fact, it has the appearance of a continuous, straggling town, with many beautiful homes and fine plantations.

Beyond the lands cultivated on the bayou are detached bodies, called brulees,

situated from four to ten miles from the bayou, which have been cleared and cultivated. The soils of these brulees are extremely productive, and could the big levees on the Mississippi river be made permanent walls of protection these brulees would be extremely valuable and desirable. Sacramento, Pierpart, Grand Bayou, St. Vincent, Big and Little Texas and l'Abadie are the most noted of these brulees. The Attakapas canal, constructed long ago, to connect the Lafourche with lake Verret, has a large quantity of cultivated lands along its banks, and is very thickly settled. This canal has been closed at the bayou, and is now used only for drainage.

A further descent of bayou Lafourche brings one to the parish of Lafourche, which lies on both sides of the bayou and follows it to the gulf. This is an extremely long and narrow parish, the upper portion of which is similar to Assumption, while the southern portion contains only narrow strips of cultivatable lands, surrounded by sea marsh. The lands along the bayou are in a high state of cultivation within twenty-five miles of the gulf. Large sugar estates, well kept and improved, follow the bayou as far down as Lockport. Truck gardening and poultry raising are much practiced by the small farmers of this parish. Below Thibodaux the ridge of high land gradually diminishes in width, and in the lower part of the parish it scarcely obtains a width of a few hundred yards.

Narrow ridges of tillable land are found on bayous Chechy and Chalalauhau in the northern, and bayou Boeuf in the southern part of the parish. Some arable soils lie adjacent to lakes Des Allemands and Boeuf. Extensive and excellent tracts of land exist, bordering on bayous de la Vacherie, Coquille and Middle. Scattered tracts, capable of habitation, are found on bayou Des Allemands. Live oak ridges are found on bayou Bleu and in the open grassy prairies, which constitute a peculiar feature in the landscape of this parish. "Trembling prairies" also abound. They consist of matted roots and decayed vegetation, partially floating upon a subterranean stream, upon which cattle graze, vibrating with each tread. Beyond these prairies the tidal marshes extend into the gulf, forming islands and peninsulas, and penetrated by numerous tide water bayous.

Almost due south of Lafourche is the immense

#### PARISH OF TERREBONNE.

Though the area is large, the extent of arable soils is limited to the numerous bayous which traverse it, all else being salt marshes, trembling prairies and open prairies. Bayous Terrebonne, Bien, Little and Big Caillon, DuChien, Au Large and Cade, run nearly north and south through the parish, while bayous Black, Chackahoula, Tigre, L'Ours, Chene and Penchant have a westerly direction. These bayous are small streams, save when serving as outlets to the Mississippi in times of high water. In the upper portions they are narrow and shallow, frequently running dry in summer and fall, while lower down they widen out, and with constant attention can be kept navigable the entire year.

In the vicinity of Houma, as elsewhere in the parish, contiguous bayous meet and increase the extent of arable land. In such places large plantations occur.

Elsewhere small farms prevail. Here, too, as on the bayou Lafourche, the cultivatable land extends within ten or twenty miles of the gulf and is succeeded by live oak ridges, which in time give way to the salt marsh nearly at the gulf. This parish has a chain of islands off its coast, the most important being Timbalier and Last island. They are sometimes swept by tidal waves, and notwithstanding the awful catastrophe which visited Last island years ago, they are still visited by pleasure-hunters.

Avoyelles parish is almost wholly alluvial, lying squarely in the great flood plain, with the Red river on its northern and Atchafalaya on its eastern boundary.

The upland is prairie and bluff, both of similar origin, jutting down between the flood plains of the Red and Mississippi rivers. These are the remains of the great western bluffs, the rest having been removed by the floods and spread over southwest Louisiana. Holloway's prairie, beginning in Rapides, runs down into this parish, at the southern extremity of which the Red river terminates its own plain and afterwards enters the great flood plains of the Mississippi river. Cut off from the mainland are the prairies of Avoyelles (on which the parish town of Marksville is situated) and Clausee des Grus.

Southwest of these prairies are isolated patches of bluff lands, extending from near Egg bend of Red river to bayou Rouge. The general surface of these bluffs and prairies is well above high water, and their soils resemble those of the bluff lands of West Feliciana and East Baton Rouge. Some of it is grayish silt, while others are of the brown loam character. The alluvial lands of western Avoyelles are like those of Rapides, of which they are a continuation. In the Atchafalaya district will be found strata of both the Red and Mississippi rivers deposits, with the latter predominating.

#### ALLUVIAL OF RED RIVER AND ITS OUTLYING BAYOUS.

The general topographical features of the Red river are similar to those described under the Mississippi. Two special features mark this river. First—The great raft in the extreme northwest portion of the state, and, second, the falls below Alexandria, due to the river crossing the sandstone ledges of the grand gulf group.

Elsewhere Red river is a fine, swiftly-flowing stream, with solid banks, which has cut its channel deep down into strata of clay, which was deposited before the birth of the present river. This clay is of similar origin and date with the buckshot clays of the Mississippi bottoms. The soils deposited by the river are light and loamy, and can be cultivated up to the levees. In Bossier and Caddo parishes have been created special levee districts, and most of the river bottoms of these parishes are now well protected from overflow. Dr. Hillgard classifies the soils of this region into four classes, viz:

First—Front land soils, lying near the river and main bayous, and of a reddish or yellowish red loam, light and easily tilled; deep and very productive. Back from the banks they become heavier and more difficult to till and farm.

Second—Back bottom soils, very pro-

ductive, and doubtless more lasting than No. 1.

Third—Bottom prairie soil. A black calcareous soil fully 12 inches deep, with large ash, water oak, cottonwood, huckleberry and horn locust occurring about it in patches. This soil is very productive. A capital soil.

Fourth—Waxy soil, occurring in patches, an exceedingly heavy, close intractable clay, mostly in low ground. It bears a stunted growth of hackberry, ash and elm, with fine growth of overcup oaks. It seems practically worthless at present.

The last two soils are doubtless derived from the older clay strata seen in the river banks; No. 4 from the stiff red and brown non-calcareous clays, while No. 3, similar to the buckshot soils of Texas, is derived from the lighter calcareous clays of the ancient swamp formation.

A large number of analyses of these soils have been made. The front land soils contain from 90 to 95 per cent of insoluble matter, which is fine sand, and about 2 per cent each of potash, lime and phosphoric acid—goodly quantities when the large amount of inert matter is considered. It rarely has over 2 to 3 per cent of iron in it, and therefore the color is due simply to the fine diffusion of this substance through the soil. This is the most prevalent, and therefore the most important, of the soils of this valley. It yields good crops, even in adverse seasons.

One characteristic feature of all Red river soils is the relatively large amount of magnesia present, frequently reaching as high as 2 per cent.

Soil No. 2 varies from No. 1 in a relatively larger amount of clay and lime.

Soil No. 3 is the finest of the valley and permeates it as far south as Avoyelles parish. It contains large percentages of potash and lime and magnesia and a fair quantity of phosphoric acid. Besides, it is very rich in nitrogen, and therefore produces good "weed," as well as fruit.

Soil No. 4 is rarely cultivated, being too stiff and intractable for profitable use.

It is often asserted that the fertility of the Red river lands is due mainly to the large amount of sulphate of lime (gypsum or plaster), brought down from the Llano Estacado (or staked plains) of Texas.

Analysis shows that whatever influence this substance may have originally produced upon the transported material which now forms the valley, it has been so altered in the effect produced as to leave only the lime remaining, since only a small percentage of sulphuric acid has been found in any of these soils. On the other hand, carbonate of lime exists in them all, and in some to a large extent. In the region under consideration there have been included the Atchafalaya basin, with the bayous Boeuf, Cocardie, Courtableau and Teche. The peculiar red tint of the Red river soils is visible throughout the banks of these streams and reveal a common origin. Even in the banks of the Atchafalaya and the banks of the Mississippi river below the mouth of Red river the thin, narrow red seams, alternating with grayish deposits, tell of floods from Red river, as well as from the Mississippi. Even the red tints of the soils of some of the western rivers tell, in unmistakable terms, of a common origin in a remote period. Bayou Vermillion owes its name to the character of the soil on its banks, which is in striking contrast to the brown loam

prairies through which it has cut its channel.

Al along the banks of the Teche can be seen this red soil, and its junction with the black prairie is everywhere noticeable. Since these soils occupy only portions of the parishes in which they occur, a detailed description of them will be given under other heads. It may be said here, however, that these soils occupy a part of Bossier, Caddo, Red River, Natchitoches, Grant, Rapides, Avoyelles, St. Tammany, Iberia, St. Martin, Vermillion and St. Mary parishes. Large portions of some and very small portions of others.

#### THE MARSHES OF THE COAST AND LAKES.

These have been described fully in our description of the parishes St. James, St. John the Baptist, St. Charles, Jefferson, Orleans, St. Bernard, Plaquemines, Lafourche and Terrebonne. To these add St. Mary, Iberia, Vermillion and Cameron, described further, and we have the marsh parishes of the state.

These lands can, in many instances, be reclaimed at moderate cost and be changed into excellent, fertile soils, capable of producing heavy crops of sugar cane, rice, oranges, etc.

The Louisiana Reclamation Company reclaimed 13,000 acres in 1883 and 1884, and was restrained from further work by the breaking of the levees during the great flood of 1884. Since that time Mr. J. B. Watkins has reclaimed a large area in southwest Louisiana, and is now having it successfully cultivated in rice and other crops. In special report No. 7, Tide Marshes of the United States, Mr. Watkins makes a report of his methods, from which the following is taken:

"Our plan of reclamation is to build dikes along the gulf, rivers, lakes and bayous of sufficient height and strength to prevent overflow of each in the event of floods from rain and storm tides, and in this we will be materially assisted by the natural levees found in many places along these waters. We cut, parallel to each other, and half a mile apart, canals 18 feet wide and 6 feet deep. At right angles with these, at intervals of two and a half miles, we cut larger canals, thus forming the land into oblong blocks half a mile by two and a half miles, each containing 800 acres. Across these blocks, at proper intervals, we cut lateral ditches 30 inches deep by 8 inches wide at the bottom, flared to 30 inches wide at the top.

"The canals are cut, the levees formed, and the dikes are, to a considerable extent, built by the use of powerful floating steam dredges. The smaller ditches are cut by ditchers propelled by steam power, passing through but once, at the rate of one and a half miles per hour. At proper localities, we erect automatic flood gates, by means of which we control the stage of water in the canals, and the necessary volume of water is regulated to some extent by the ebb and flow of the tide. This is supplemented by the use of powerful wind pumps, and when the natural elements will not accomplish the work we readily move upon the canals to the spot our ditching, plowing and cultivating engines and attach them to pumps. Thus arranged, with control of the water, these blocks of land are in condition for the most successful rice culture. Rice may be planted any time from February to June, very much the same as wheat and

upon ground similarly prepared. When it has reached a growth two inches high water is let in upon it and the ground gradually flooded; care being taken not to cover any of the plants with the water. The land is kept flooded sufficiently to kill all the grass and weeds, until the rice is about 18 inches high. It then has sufficient start to choke down any foreign growth, and the water may be drawn off and the ground allowed to become dry and firm for harvest time, which may extend over several months, according to the times the seed was sown. Rice is harvested and threshed in the same manner and with about the same kind of machinery as used for wheat.

"Our operations were begun in December, 1882, and we have since then built and have in use machinery as follows: Three steam dredges, with a capacity of a mile of 6 by 18 feet canal per month each, two ditchers, four traction engines, which propel the ditchers, plows, cultivators, sowers, reapers, etc.; thirty-two plows in gangs, having a capacity of 70 acres per day; two steamboats, and nine auxiliary boats, barges, quarter boats, etc."

#### BLUFF LANDS.

On the eastern side of the river is a belt of bluff lands running from the Mississippi line through West and East Feliciana, East Baton Rouge, Livingston, and perhaps small portions of Ascension and St. Helena. In length this belt is about fifty miles. Its width in the northern portion is not over 15 to 18 miles, but further south it widens to nearly double this distance. Just below the city of Baton Rouge these bluffs turn to the southeast and east, and parallel bayou Manchac, nearly to lake Maurepas. These bluffs on the Mississippi line rise to a height of 100 feet or more, are hilly and broken. Further south they flatten out, being only about 75 feet at Port Hudson, and 45 feet at Baton Rouge. Further eastward they continue to fall, until they reach the level of the pine flats and alluvial bottoms.

Although the soils of this section have been in cultivation for a long time (it is one of the oldest portions of the state), and treated in a most irrational and unscientific manner, yet they can be made, with proper attention, to produce even now the largest yields. Nowhere in the state can be found more prosperous and intelligent farmers, and nowhere on earth can a general diversified farming, be more advantageously conducted. These are probably the finest hill lands in the world. Far above overflow, here the farmer enjoys the enviable privilege of cultivating alluvial lands elevated above the floods, and susceptible of the best of drainage.

On the western side of the Mississippi river only scattered remains of these bluffs are found. They run through West Carroll, Richland, Franklin, and then in scattered patches on to the gulf. Though no lofty hills are left in this section, yet the materials which once formed them have been used to adulterate, commingle with and overspread all of the latest formations of the western portion of the alluvial plain of Louisiana.

All of the prairies of southwest Louisiana owe their origin to the deposition of materials from the disintegrated bluffs spread out over the coast marshes or pine flats. The area in this state occupied by bluff materials is therefore

large. In places these bluffs consist of an upper stratum of brown loam, underlain by the calcareous silts of the loess formation, which in turn overlies the blue clays of the Mississippi bottoms. In the general degradation of these western bluffs and their subsequent transportation, assortment and deposition by running water, soils of all grades from a rich, stiff black prairie to a poor, gray, silty pine woods, have been formed. Accordingly we find, to the east and south, in southwest Louisiana, extensive developments of the black prairie, changing gradually westward and northward into the brown loam prairie, and this in turn giving away to the gray, silty pines of the extreme western portion.

These prairies lie in Calcasieu, Acadia, St. Landry, Lafayette, Vermilion, Iberia, St. Martin, St. Mary and a small portion of Cameron. This section includes what was originally known as the Attakapas and Opelousas prairies, and has been rendered famous by Longfellow, who has styled it the "Eden of Louisiana." Until recently it was occupied only by countless herds of cattle and ponies, but now it is entirely under fence, and most of it under cultivation, and happy homes and thrifty towns are everywhere to be seen. Over 7000 families from the prairies of Iowa, Nebraska, Kansas and Illinois have enthroned their "Lares and Penates" in this balmy land and more prosperous agriculturists cannot be found anywhere on earth than these recent settlers upon southern soil.

#### BLUFF PARISHES OF THE STATE.

West Feliciana, adjoining the state of Mississippi, has alluvial, bluff and good oak and hickory uplands. The bluff lands largely predominate. They lie between the alluvial lands on the river and the hill lands of the extreme east, and are quite hilly and broken, with ridges rising several hundred feet, with ravines or narrow valleys between. In some places there are tracts of level or slightly rolling plateaus, with the brown loam on the top, and on their sides a mixture of the loam with the calcareous silts, which gives an excellent soil. In the southern portion of the parish the ridges are not so elevated—the level areas more extensive and large tracts are cultivated. The oak uplands are similar to those in the adjoining parish of East Feliciana.

East Feliciana has its southeastern extremity composed of bluff lands—the dividing line between them and the oak uplands crossing from West Feliciana to East Baton Rouge parish, a few miles south of Jackson. This belt is here about twelve miles wide, and has the same characteristics as similar soils in East Baton Rouge. Beyond the line described alternations and intermixtures of bluff and pine soils prevail for a short distance, when the latter continues on through the parish. East of the Comite the lands are more broken, the short-leaf pine predominating in the woods. The appearance of the long-leaf pine is first encountered near the Amite, which, after passing this stream, is the prevailing timber. A small section of this parish in the northeast corner may be classified with the long-leaf pine region.

This is one of the best hill parishes in the state.

East Baton Rouge is emphatically the

bluff parish of the state. A small portion of the extreme northwest corner is of the oak and pine uplands. It has two tracts of alluvial lands, one bordering the Mississippi and the other along bayou Manchac. The bluff soils of this parish are light loams, with the dark orange colored subsoil near the surface. These soils were originally covered with a forest of magnolia, beech, swamp chestnut, oaks, sweet gum and sassafras, with an undergrowth of swamp cane everywhere.

The original soil was a black, deep, easily tilled loam of such profuse fertility that few settlers could be persuaded to leave it for the bottoms. But the removal of the timber and cane and general improvident cultivation has caused much of the original soil to be washed away. Bermuda and carpet grasses have taken possession of these lands and checked the denudation by rains, at same time furnishing excellent pasturage for stock of all kinds. These soils require only deep and thorough tillage and rational rotation of crops to more than restore the original fertility.

As the river lands were reclaimed from the floods they were occupied by the large planters from the hills, and hence this parish became more and more the abode of small farmers and under their thrifty management it is fast becoming one of the most productive parishes of the state. One would not wonder at this, when the many advantages of rich soil, easy tillage, high elevation and enlightened yeomanry all conspire to make it one of the finest farming countries in the world.

Livingston Parish—Undoubtedly a part of this parish is bluff formation. How much a detailed survey will have to decide. Lockett, in his topographical map, makes over one-half of this parish of this formation, the rest being long-leaf pine flats and alluvial bottoms along the Amite river. Hilgard in his report on the cotton production of Louisiana, makes the larger part long-leaf pine flats and the rest long-leaf pine hills and alluvial bottoms.

The alluvium along the Amite are second bottoms, elevated from 25 to 30 feet above the river bottom, and covered, where not cleared, with oaks, beech, gums, dogwood, short-leaf pine, and a few magnollas. The surface soil is grayish brown, or brown overlying a red sandy clay subsoil, and is good. The grass on these bottoms when abandoned furnishes excellent pasturage for stock. The rest of the parish is divided between the bluff formation, long-leaf pine hills and flats.

Along the tributaries of the Amite and Tickfaw are small bottoms densely covered with swamp cane, which furnishes food for cattle during the winter. This parish is noted for its fine timber, turpentine and cattle.

West Carroll parish lies between bayous Macon and Boeuf, and consists of bluff and alluvial soils. On the east a narrow belt of the Tensas bottoms fringes the parish, while on the west a larger belt of the Boeuf bottoms runs the entire length of the parish. On the banks of the Macon the bluffs often reach the height of 20 feet, sloping gradually to the westward, the lands gradually improve as we descend, the loam of the bluff often penetrating the Boeuf bottoms, forming frequently the subsoils of the

latter. These soils are highly productive. The alluvial lands of this parish are more extensively cultivated than the hills.

South of this parish, and adjoining it, is Richland parish, similar in every respect to West Carroll. Through this parish the floods of the Mississippi river pour whenever the levees of the Mississippi river in lower Arkansas break. By the continual abrasion in the past the bluff lands of this parish have been disintegrated and spread over the entire flood plain. Occasional islands of bluff formation, elevated several feet above the general level of the country, are encountered. This parish has greatly suffered in the past by these periodical floods through Arkansas, and if the levees now constructed at the joint expense of Arkansas and Louisiana can be made permanent, it will become one of the most attractive parishes in the state.

Franklin parish, south and east of Richland, is almost entirely of bluff formation, with a narrow belt of alluvium lying between bayou Macon and the hills, and a similar belt on the west with bayou Boeuf. The lands of this parish improve as we go south and yield fine crops of corn and cotton.

Patches of bluff lands occur in Catahoula, Rapides and Ayoelles, but no extensive tracts are encountered until we reach St. Landry, the beginning of the prairies of southwestern Louisiana.

St. Landry parish is partly alluvial, partly prairie and partly bluff, with a small portion in the northern part of long-leaf pine. The hills of the parish are the remains of the western bluffs of the Mississippi river, while the prairies are the spread-out materials from these bluffs. The eastern part of St. Landry is wholly alluvial, forming a part of the great Atchafalaya basin. Bayou Courtableau, a tributary of the Atchafalaya, is navigable as far as Washington, in this parish. From Washington and Opelousas the prairies extend to its western boundary. These prairies are, in the extreme northwest, of the silty character. South and east of this, running nearly to Opelousas and Washington, are the brown loam; while in the extreme southern part of the parish occurs the black prairie. Belts of timber extend only along the streams of this parish.

Bayous Cocodrie and Boeuf (which together form the Coutableau) and Teche flow along the foot of the uplands of this parish, and have derived their waters mainly from Red river, and the alluvium along their banks are predominantly Red river alluvium.

Acadia parish, recently formed from St. Landry, is entirely prairie, the latter consisting mainly of the brown loam and black characters. This is one of the most prosperous parishes in the state, and when properly drained, as it will be in the near future, will be one of the most fertile. Nearly the whole of this prairie is underlaid at a few inches with a stratum of impervious clay, strongly calcareous, which retains the water falling on the surface, and on account of the general level character of the prairies, preventing drainage, this water has to be evaporated. The result is seen in the numerous water grasses found everywhere. Running, however, through this parish are numerous bayous and rivers, which have cut channels 20 to 40 feet

deep, which would, if utilized, furnish drainage canals for the country.

If a system of drainage ditches were established connecting every farm with these water courses and ridge culture with deep plowing practiced, quarter drains leading to ditches dug so that the rains could be rapidly removed and the subsols thoroughly aerated, these soils could be made profusely productive. The rapid influx of intelligent immigrants to this parish will soon realize the necessity for such action and secure proper laws, either through state, legislative or provincial police jury. In the underlying clays are frequently found white concretions of nearly pure carbonate of lime.

Lafayette parish consists largely of bluff lands and rolling prairies of the brown loam type. In the southern portion the black calcareous prairie occurs. A belt of alluvium follows the Vermillion river through the parish and another runs along the entire length of the north-eastern boundary of the parish. The bluff lands are well developed in the Carencro and Cote Gelee hills. This is one of the smallest but most fertile parishes of the state.

Vermillion parish, in the northern part, is mainly black prairie, where the alluvial lands lie along bayous Vermillion, Queue de Tortue and Mermentau. These lands have long been cultivated, and are highly esteemed. Along the banks of the Vermillion river, which is navigable as far as Lafayette, in Lafayette parish, were once fine sugar plantations. A few of the latter still survive, and more will be resurrected now, since Abbeville, the county seat, has recently been connected by rail with New Iberia. The southern portion is mainly coast marshes, and, with the exception of two islands with cultivatable ridges, near the gulf, are uninhabited and uncultivable. This parish is mainly occupied by the Acadians, of French-Canadian origin, but large numbers of western men have recently settled therein, and, from present prospects, will soon fill up this fertile parish.

Calcasieu parish has increased in taxable values and population in the last ten years more than any other parish in the state. In area it is the largest parish in the state. Its extreme southeastern portion is black prairie, the northeast and southwest portions are silty prairies, while the northwest is pine flats. A small portion of the extreme south is coast marsh and a similar portion of the extreme northwest is long-leaf pine hills.

The lumber trade of this parish is enormous and finds an outlet through the Calcasieu river to the markets along the gulf coast and by rail to the states north and west. This parish has recently been extensively settled by intelligent farmers from the northwest, who have established farms all over the prairies and are growing rice and sugar cane, fruits, garden trucks, etc. The thriving towns of Jennings, Lake Charles, Welch, Iowa City, etc., attest their thrift and prosperity. The prairie soils, like those of Acadia, need drainage before they will show their true productive power, and some general system must be established for the benefit of all concerned. In the western part of the parish the soils are of the silty order and less productive. All over the parish mounds of 2 to 4 feet in height and 25 or more feet in diameter occur. These are immense ant hills, made by animals now extinct. These greatly interfere with

cultivation until levelled. In this parish occurs also the famous sulphur mine and petroleum wells, all the product of the land, being taken by the Southern Pacific Railroad.

Iberia parish presents a variety of features. It is largely alluvial, belonging to the great Atchafalaya plain. Directly along the banks of the Teche lies a belt of red lands; about 50 yards wide, on each side, evidently the deposits of Red river, made long ago. This is above overflow and yet below the general level of the country. From this belt there is a rise of 2 to 6 feet to the black prairies, which extend southward to the sea marshes. Grand Marais, a fresh water marsh, one mile wide and ten long, running northwest and southeast, three or four miles from the Teche, is a notable feature of this parish. The sugar plantations lie mainly along the Teche, though the prairies are now being ditched and brought into cultivation. These prairie lands are highly esteemed for their sweet canes. In the coast marshes of this parish occur three island rising to the height of 160 to 180 feet—the last remains of the former bluffs of the western mouth of the great river—viz: Petite Anse, now called Avery's island (2240 acres); Grande Cote, or Week's island (2300 acres), and Orange island, on the shore of lake Peigneur (2250 acres), now the property of Mr. Joseph Jefferson, the great comedian. These islands were originally covered with timber and the soil is of the brown loam character, peculiar to the undisturbed bluff formation. Avery's island is noted for its great beds of pure rock salt, which are now extensively mined. Orange island is chiefly used in the production of oranges.

St. Martin's parish should more properly be classified as an alluvial parish, since much of the larger portion lies in the great alluvial basin of the Atchafalaya.

Between the bayous Teche and Tortue the land is mainly of the brown loam rolling prairie. The band of red alluvium borders the Teche here as in Iberia. On the east it shades off into the alluvial prairie, which extend three to five miles, and then in turn are bordered by arable wooded ridges of brown loam character. East of these the land is low and wet to the Atchafalaya. Immediately on the Atchafalaya is a tract of high land called Butte la Rose. On the west side of the Teche the brown loam prairies are about three miles wide and extend to the alluvial lands of bayous Vermillion and Tortue. The Teche is navigable to St. Martinville. All along this stream sugar plantations occur. Mixed farming is also practiced by the frugal Acadians, which mostly populate this parish.

St. Mary parish is almost wholly alluvial, yet the northwestern portion, south of the Teche, including the Cypress prairie and the islands of Cote Blanche and Belle Isle, are undoubted bluff formation. This is the largest sugar-producing parish in the state, and the magnificent sugar estates lying on bayou Teche, with their palatial residences surrounded by regal liveoaks, their neatly kept quarters, and the immense sugar-houses, present a scene that would justify much time and trouble to witness. By many this is regarded as the lovellest portion of Louisiana, and certainly as fertile as the best. The arable land on the Teche varies from

one to five miles. The lands on the east bank are lower, and in the lower portion of the stream liable to overflows when crevasses occur in the Mississippi near the head of the Atchafalaya. Sugar estates also exist on Berwick's bay, bayous Boeuf and Atchafalaya.

Bayou Sale furnishes the finest sugar lands in the state. The characteristic red tint of the Teche lands can be seen as far down as Franklin. Cote Blanche island, with an area of about 2000 acres, lies on Cote Blanche bay, and resembles in all its features those islands described under Iberia parish. So, too, with Belle Isle (area 350 acres), which lies on the western headland of Atchafalaya bay, the most southernmost point of the ancient bluff formation.

Cameron parish is mainly sea marsh; with only a small portion of the northern part of plains. Along the Calcasieu, Sabine and Mermentau rivers occur tracts of excellent arable lands, which are thickly settled and well cultivated.

Grand Chenere on the Mermentau pass, Cameron on the Calcasieu pass, Hookbury Island, and Grand Lake on the Calcasieu lake and Shell Bank on the Sabine are prosperous settlements. Along the coast ridge running from the Mermentau across the parish to the Sabine, are to be found many prosperous farmers. Orange culture, with fishing and oystering is the chief employment of these coast dwellers. The soils are excellent and the climate delightful, rendering a home here pleasant, save for inaccessibility. Along Johnson and Black bayous are also a few settlements.

#### GOOD UPLANDS

constitute the main portion of northwestern Louisiana, and include wholly or in part the following parishes: Caddo, Bossier, Webster, Claiborne, Union, Ouachita, Morehouse, Caldwell, Catahoula, Lincoln, Jackson, Bienville, Red River, De Soto, Natchitoches and Sabine. East Feliciana, West Feliciana and East Baton Rouge, in the eastern part of the state, are partly of this formation. These lands have a forest growth of short-leaf pine, intermixed with oaks and hickory, the latter predominating on the best soils, and their presence may be used as a guide in the purchase of lands. The surface soils of this region are supplied mainly by the sands and clays of the "red sandy clay" formation, while the creeks' bottoms are lying in the Arcadia clays, and their soils are derived from them alone, or mixed more or less intimately with the sandy clays washed down from the hills. This country is settled mainly by small farmers, who, as a rule, are prosperous, happy and contented. They practice "mixed" farming and grow cotton or tobacco as money crops only, raising their supplies for stock and families. No portion of the state, by its own unaided efforts, is more rapidly improving. Little or no immigration has yet been secured, yet the evidences of thrift and improvement are visible in most every neighborhood. No part of Louisiana is more inviting to the man of moderate means, accustomed to do his own work, than the good uplands of this state. The soil is easily cultivated and susceptible of the highest improvement, responding well and readily to proper fertilizers. The drainage is excellent, the

rainfall abundant and the climate most congenial to health and outdoor exercise the year round. The greatest variety of crops can be grown here. Churches are abundant and schools numerous and well attended. Lumber abundant and cheap.

The best of springs and wells are to be found almost everywhere.

The following description of the soils of this section is taken from a recent report of the geological survey made by Dr. Leich, under the auspices of the state experiment stations.

## SOILS OF THE HILL LANDS

### OF NORTHERN LOUISIANA

**Red Sandy Clay Region**—These soils, occupying the hills of north Louisiana, may be classified into—

- a. Black sandy.
- b. Gray sandy.
- c. Yellowish red sandy.
- d. Deep red sandy loam.

These varieties graduate the one into the other almost imperceptibly. Yet in the central portion, from north to south and in the Dolet hills, the red sandy loam predominates. These varieties are derived from the immediately underlying geological formations, the red sandy clays and the drift, or a mixture of the material of both. Occupying, as they do, hillsides of more or less declivity, they drain well. Of sufficient porosity to permit of a thorough percolation through them of water, they may be classified as dry soils. With a clayey subsoil underlying them at shallow depths, they obtain and appropriate fertilizers with great facility. The "black sandy soils" of this division, occurring particularly in the eastern and western portions of this district, owe their peculiarity of color to the presence of humus. They are derived mainly from the "drift" and underlain by the red sandy clays, and vary in thickness from a few inches to many feet. They consist mainly of rounded quartz grains, with small proportions of humus and mineral matters. They are poor, droughty and easily washed away by heavy rains under improvident culture. They are cold soils, and hence bring better crops of corn than cotton. The plowing in frequently of crops of clay peas, the application of mineral manures, together with a proper system of terracing, will add materially to the productive capacity of these soils.

The gray sandy soils possess in intensified form the properties described under the "black sandy soils." Being more deficient in humus, the remedies there prescribed, will apply with greater force here. Composts of cotton seed,

stable manure, pine straw and acid phosphate, are especially valuable on these soils. In the neighborhood, marls may be used with great success, in quantities of fifty to one hundred bushels per acre. Both physical and chemical benefits will thus be obtained.

The yellowish red sandy soils occur in patches over the entire district, graduating on the one hand to gray sandy and on the other to sandy loams. They are superior in quality to either of the above and may be made very productive. They are mixtures of the "red sandy clays" and the "drift" and their physical properties are good, therefore they retain moisture fairly well and are not so subject to wash as those already described.

The red sandy loams, occupying chiefly the central portions of the district, but occurring elsewhere in patches of varying size, are the characteristic "red lands" of north Louisiana. They are derived from the underlying "red sandy clays" wherever the overlying sands have been washed away. Magnificent fields of this class of soils are found in many portions of this part of Louisiana, and, although long in cultivation, are still yielding profitable crops. Its color is due to iron oxide, and with this latter is usually associated goodly percentage of phosphoric acid. This is an ideal soil, susceptible of the highest improvement and capable of producing enormous crops. With a similar subsoil, deep plowing, if gradually performed, will greatly enhance fertility and crop producing power.

The crying want of all these soils as demonstrated by the experiments at the north Louisiana experiment station at Calhoun, La., is nitrogen. To supply this ingredient, in its cheapest and best form, recourse may be had to some of our running varieties of cow peas. A rotation of oats, cow peas, cotton, corn (the latter also with cow peas), as practiced and recommended by the north Louisiana experiment station, will improve all of these soils and most rapidly, if each crop be fertilized with a suitable manure. The soluble phosphates used in conjunction with nitrogenous manures

have been found highly beneficial. Alone, they have proven of little value.

The bottom soils of this district have been derived wholly or in part from the underlying "Arcadia clays" (gray clays), described in the geological report as everywhere underlying the "red sandy clays." These soils are found in all the creek bottoms and wide flat valleys of north Louisiana and may be classified under two heads: (a) Gray loams. (b) Gray clays.

When the soils of the hills have been washed down and mixed with the gray clays of the valleys, gray loams are to be found. Where no such washing has occurred the pure "gray clays" exist.

In small creek bottoms the former usually exist and are very productive. They are, however, subject to overflow, and, therefore, are usually not highly esteemed except for grasses and permanent pastures. Could they be properly drained and protected from floods, they would be very valuable. This could be accomplished by levees, and by deepening and widening the channels of the creeks which flow through them. In this way large areas of extremely fertile soils could be recovered and the general health of the country greatly improved by the removal of the stagnant water in the swamps, the present breeding places of malaria and fevers. These soils hug the hillsides, giving way in the middle of extended tracts of bottom lands to the true "gray clays" derived "in situ" from the underlying Arcadia clays. These clays form the chief soils of extensive tracts of bottom lands in many parishes of north Louisiana. They possess the characteristics of all clay soils, tenacious, heavy and old, drying and cracking in dry weather, and running together in seasons of heavy rainfall. They are very fertile if properly handled, which means that they must be well drained, thoroughly broken and have incorporated with them a goodly amount of vegetable matter.

These two classes of soils shade imperceptibly into each other, and in one bottom may be found every shade of soil, from pure sand (washed down from the hills) to pure clay.

## DESCRIPTION OF THE PARISHES.

### CADDO PARISH

occupies the extreme northwest portion of the state, and is greatly cut up by numerous lakes and bayous, with a large portion of the northern part of the parish covered with overflows from the great raft of Red river.

The uplands are everywhere esteemed as good farming lands, while the bottoms of the Red river are simply superb. Shreveport, the parish seat, and second city in size in the state, is situated on the eastern terminus of a ridge dividing Cross lake from Boggy bayou. It is immediately on the Red river and has an extensive trade. The establishment of a levee district in this parish has given promise of the permanency of the levees which protect the alluvial lands from the overflows of the Red river. During the greater part of the year this city can be reached by steamers from New Orleans.

### BOSSIER PARISH

is composed of good uplands and splendid alluvial bottoms. The former lie mainly in the northern and eastern, and latter

in the southwestern part of the parish, and is protected from overflow by levees built and guarded by the Bossier levee district. The peninsula running down between Red river and lake Bistineau, including portions of Bossier and Webster parishes, and locally known as the "Point," has soils somewhat peculiar, consisting of three kinds: First, constituting about three-fourths of the area, a fine sandy, blackish loam, with a yellow sandy loam subsoil, with oak and hickory lumber and a few scattered short-leaf pines; second, a heavy brown clay loam with similar subsoil, with few short-leaf pines; third, blackjack ridges but little cultivated and very unferile.

Between Red river and Cypress bayou a fair rolling upland country prevails. East of Cypress bayou there is a belt of red ridge land, with occasional high hills covered with red ferruginous earth. East of this ridge occurs a belt of level post oak land, in the southern part of which are treeless prairies, with white unproductive soil.

### WEBSTER PARISH.

In the center lies the broad, alluvial bottoms of bayou Dorchite, which, alternately, in the southern portion, is covered by lake Bistineau. In the northwest is the flood plain of bayou Bodecau. A level country extends from the Arkansas line to lake Bistineau, between bayous Dorchite and Bodecau. This country is of variable fertility. Some of it is covered with short-leaf pines and is of only fair quality. Some covered with dogwood and post oak, with white, crawfishy soil, is but slightly better, while another portion, well drained, gives excellent crops of corn and cotton. East of the Dorchite, the lands are rolling, with alternations of red and gray soils. On lake Bistineau and Black lake bayou is whitish, clayey soils, with water oak and black gum prevailing. This parish is connected by rail to Minden with the outside world.

### CLAIBORNE PARISH

This parish is truly one of uplands, without any alluvial lands save small creek bottoms. It is also one of the best upland parishes, having a considerable area of red lands. It contains the highest elevations in the state. The dividing ridge between the waters of d'Arbonne and Black lake is said to be the highest elevation in the state. North of the d'Arbonne the country is slightly broken, the soils mainly gray sandy with red subsoil. This parish consists almost entirely of small but well-tilled farms, with numerous villages, scattered throughout the parish. A railroad running from Homer to Bienville, in Bienville parish, and crossing the Vicksburg, Shreveport and Pacific at Gibbsland, gives easy access to the outside world.

### UNION PARISH.

This parish is similar in every respect to Claiborne, with probably a little more inferior soil. The ridges between the forks of the d'Arbonne are high and level, and upon them occur some of the best lands of the parish. The ridges between the bayous Corney and l'Ouire are high and broken, but are of the red land character. Farmerville, located on a ridge of the former, is the county seat, and is surrounded by numerous small, but well tilled, farms.



The northeastern section is hilly, with red sandy soil, but more sparsely settled. Southeast, towards Ouachita parish, there is considerable hill land, too broken for cultivation, but south of this the country is less rolling and nice farming lands exist. A considerable area of alluvial lands lie along the bayou d'Arbonne and the Ouachita river. This parish is without railroad connection with the outside world. In high water small steamers ascend bayou d'Arbonne as high as Farmerville. A railroad is, however, projected to Farmerville, and when it is built will give new life to the parish and higher values to land, now greatly depressed by exclusion from the world.

#### OUACHITA PARISH

Consists of hills and alluvial lands in almost equal areas, the former mainly on the west and the latter on the east of Ouachita river. The hills are mainly of oak and hickory uplands, though in the southwestern part of the parish is a considerable area of long-leaf pine. In the timber of the northwestern hills occur the large-leaved magnolia (*magnolia macrophylla*), a rare tree elsewhere in the state. In the swamps of the bottoms the tupelo (*Nyssa uniflora*) is the chief timber. Between the oak uplands and long-leaf pine region occur the famous swamps covering several square miles, known as the Cheniere au Toufre. The beautiful red land plateau running at the foot of an oak ridge, upon which Indian Village is situated, is both alluvial and fertile. East of the river is a narrow ridge dividing the waters of the Ouachita from the Lafourche. All the rest of the land is alluvial or deposited bluff. The island, formed by bayou de Slard and the river, is noted for its fertility and is above overflow. In the south part of the parish is a prairie known as Du Bois, which is similar to those in Morehouse and Caldwell parishes. The north Louisiana experiment station is located at Calhoun, in the oak uplands of this parish.

#### MOREHOUSE PARISH.

Like Ouachita, it is composed of alluvial plains, oak upland hills and bluff or prairie. The first, however, constitutes nearly two-thirds of the parish. Two upland peninsulas reach down from Arkansas in this parish, separated by bayou Bartholomew. On the eastern and larger one Bastrop, the parish seat, is situated. These ridges gradually sink beneath the prairies and alluvial flats. It is inferred from the red subsoil of these flats and prairies that they have been formed from the disintegrated bluff lands and spread out over a sandy plain. These lands are excellent, drain well and bring annually large crops.

The Boeuf bottoms are esteemed rather higher than those on the Ouachita, especially the "gum lands," which rank as the equal of any in the state. These are followed in order of fertility by the prairie, the stiff cane lands and the hummock lands. The uplands of this parish furnish excellent lumber, but are not extensively cultivated.

#### CALDWELL PARISH

consists of a variety of lands, long-leaf pine hills, alluvial plains of Boeuf and Ouachita rivers, central prairie region and oak uplands. The last constituting

only a small portion of the parish, with the other three about equally divided.

The eastern and southeastern portion of the parish is long-leaf pine hills, interspersed with the hunc prairies. Between it and the alluvial flats of the Ouachita occurs a bed of good uplands; also interspersed with prairie outcrops. The land between the Ouachita and the Boeuf is in this parish almost wholly alluvial, only a very narrow ridge running down to their forks, remaining out of the water in high water. Strong levees on the Mississippi river in Arkansas would protect these bottoms from overflow and make them extremely valuable. It is hoped that those recently constructed will prove permanent and effective. In the southern part of this parish occurs prairie du Cote, with yellow loamy soil, another remnant of the bluff formation.

#### CATAHOULA PARISH,

known in early history as Ocatahoula, is, perhaps, the most diversified parish, so far as soils are concerned, in the state. It consists of alluvial land, long-leaf pine hills, central prairies, bluff lands and oak uplands.

A large part of the parish is alluvial and includes all of the southern and part of the eastern portions. The long-leaf pine hills come next in size and occupy the southwestern portion. A lowland belt of the central prairie region covers the northwestern portion of the parish, while the bluff formation insinuates itself between this alluvial and the long-leaf pine hills, starting at Sicily island and ending at Catahoula lake. These bluffs are several times severed by water courses, but their general direction is maintained.

The narrow slip of oak uplands occurring in Caldwell continues until it reaches Harrisonburg, the parish seat. The pine hills of this parish are not so abruptly steep as elsewhere and near the Ouachita are pebbly and of a better character than elsewhere. The prairie region is also quite hilly and in the eastern portion black prairie soil may be found high up on the ridges. On the slopes of these ridges are found such lime loving lilies as the walnut tulip, etc.

In the western portion "hog wallow" and post oak flats prevail, with occasional patches of true black prairie. The largest tract of black prairie (*Pendurvis*) is in the fork of bayous Castor and Dugdemona in Winn parish. Sicily island, cut off from the bluff lands of Franklin by the Ouachita river and from the great alluvial plain by bayou Louis, is mainly of bluff formation and marks the course of the western boundary of the ancient river which preceded the present Father of Waters. Catahoula prairie and one just south of it, in this parish, as well as Holloway's and Avozelles prairies, further south, are further remnants of this same formation.

Catahoula Lake—Sixty square miles of surface is wholly in this parish.

#### LINCOLN PARISH

is perhaps the best upland parish in the state. It is wholly oak uplands, and has a larger exposure of red soils than any other parish, estimated at one-half of the parish. These lands, though hilly and broken, are quite productive. The remainder of the parish is gently rolling, with the prevailing yellow sandy soil. Here, as elsewhere in this district, the character of the soil can be best deter-

mined by its rice growth. A preponderance of hickory over oak, and oak over short-leaf pine, are fair indices for guidance in the purchase of land. This parish is filled with small but intelligent, progressive farmers, and is rapidly improving, both in material wealth and in social and intellectual development. Ruston, its county seat, is a thriving town, with excellent churches and schools.

#### JACKSON PARISH

Lying south of Lincoln, it is composed of oak uplands and long-leaf pine flats. The soil is chiefly of the yellow sandy clays, but north of Vernon, the county seat, occurs prominent red land ridges, which are very productive. Similar lands occur southeast of Vernon on bayou Castor, where a number of good farms occur.

In the southern part of the parish the long-leaf pine prevails generally on the tops of the ridges, while their slopes are timbered with oaks, mixed with the short-leaf pine, and are fairly productive. A small exposure of cretaceous black prairie, underlaid by limestones, is reported near Rochester in this parish, which is similar to those outcrops in Winn and Bienville.

#### BIENVILLE PARISH

is mainly oak uplands, with the yellow sandy clay predominating. The lands are gently rolling, sometimes nearly level, especially in the western portion. The Arcadia clays are well developed in the level portion of the parish, and on them the water and black oaks predominate. The bottom lands of the streams and the flats bordering lake Bristineau are of this character. Where the country is rolling the red subsol appears, often with concretions of limonite (iron ore). In the extreme southeastern part of the parish, as in Jackson parish, are ridges with long-leaf pine on their tops, but oaks with short-leaf pine on their slopes. In Brushy valley and northward red lands occur and excellent crops are grown both on the hills and in the valleys, which are here not subject to overflow. In this parish occur several salt licks, where much salt was made during the war. These are underlaid by gypsum and cretaceous limestone, and from the latter good lime could be burnt. It might be found profitable to use such lime on these soils. There occur also in this parish outcrops of calcareous and green sand marls, which also might find utilization by application to near-by lands.

#### RED RIVER PARISH

is partly oak uplands and partly alluvial, with a slight preponderance of the former. The uplands form the divide between the waters of Grand bayou, of Black lake and the Red river. They vary in character from light sandy to reddish sandy clays, the latter readily told by the prevalence of Spanish oaks in the timber.

The front lands of the alluvial plain are comparatively free from overflow, while the back lands are less protected on account of numerous bayous which traverse them. Large plantations occupy the banks of this river throughout this parish.

#### DE SOTO PARISH

is one of the best upland parishes. The dividing ridge that lies between the

waters of the Sabine and Red river crosses this parish diagonally. Mansfield, the parish seat, is situated on it. Near the Red river the country is hilly and broken, constituting what is known as the Dolet hills. The ridges have a reddish subsoil, and are not very thrifty, though the valleys are fairly productive. Lakes and bayous interlacing each other lie at the foot of these hills, against the western edge of Red river. On many of the bayous of this parish occur many large, flat tracts of the Arcadia clays, which, when well drained, make fairly remunerative crops. On the Sabine slope of the divide occur generally rolling plateaus, with wide and fairly fertile valleys between. Grand Cane bayou furnishes the richest part of the parish.

#### NATCHITOCHE PARISH

is made up of a variety of formations, with the long-leaf pine hills constituting nearly one-half of the parish. The river bottoms are next in area, followed by oak uplands. Small outcrops of central prairie region also prevail. The long-leaf pine hills prevail in the northern part of the parish, north of Black lake. Here also occur the salt rocks, underlaid with cretaceous gypsum and limestone. Between Black lake and the alluvial plain of Red river occurs the ridge of oak uplands, running down from Red River parish. South and west of the alluvial plain is another ridge of oak uplands, coming down from De Soto, which terminates a few miles below Robeline. South of this line, the long-leaf pine continues to the lower end of the parish. Natchitoches is one of the oldest, largest and most productive parishes in the state. The large areas of cultivatable lands lying on the Red river, Cane river and other old beds of the river are all occupied by large plantations and fine old homes. These lands are as fertile as any in the state, and by their large annual yields make Natchitoches one of the largest cotton-producing parishes of the state. Natchitoches, on Cane river, is the oldest settlement in the state, and is now connected with the outside world by a branch road to Cypress, on the Texas and Pacific Railroad.

#### SABINE PARISH.

The lands of this parish are divided between the good uplands, central prairies and long-leaf pine hills, with the first largely predominating. The last has only a small development in the southern part of the parish. West of bayou Toreaun is a sudden transition from long-leaf pine sands to the better lands of the central prairie.

On the hills, oaks, with short-leaf pine, growing in a deeper colored soil, take the place of long-leaf pines, while the valleys exhibit true black lime prairies, which indicate the presence of the marine tertiary formation. A belt of this character, six to seven miles wide, runs in a northerly direction across the parish. Ridges, crested by long-leaf pine, but sloped with oaks and short-leaf pine, run out into the uplands north of Many and continue to the edge of De Soto parish.

Bayous Negreet and San Patricio furnish the best lands of the parish.

Sabine is noted for numerous small but thrifty farmers. It is said that there is not a mortgage upon the record

books of the parish, showing the independent and self-reliant character of its people.

#### THE LONG-LEAF PINE REGION

Covers a part of Calcasieu, all of Vernon, except Anacoco prairies, all of Rapides outside of alluvial bottoms, parts of Natchitoches and Sabine, nearly all of Grant and Winn, parts of Bienville and Jackson, a small part of Ouachita and large portions of Caldwell and Catahoula. East of the Mississippi river it embraces nearly all of the parishes of St. Tammany, Washington, Tangipahoa and St. Helena and a part of East Feliciana.

All of this section abounds, except in the bottoms, with the long-leaf pine (*Pinus Australis*). Occasionally, on the improvement of the soil, a few straggling oaks (chiefly black jack and post) and short-leaf pines will be found intermingling with them. The prevalence of these trees will generally measure the capacity of the soil. The long-leaf pine follows a certain class of soils and mainly confines itself to such, but it is frequently found on sandy ridges, running into other formations. Isolated tracts are also found considerably beyond the formations here described. There are two divisions of this region. One, the "long-leaf pine hills," and known geographically in Louisiana as the "grand gulf group"; the

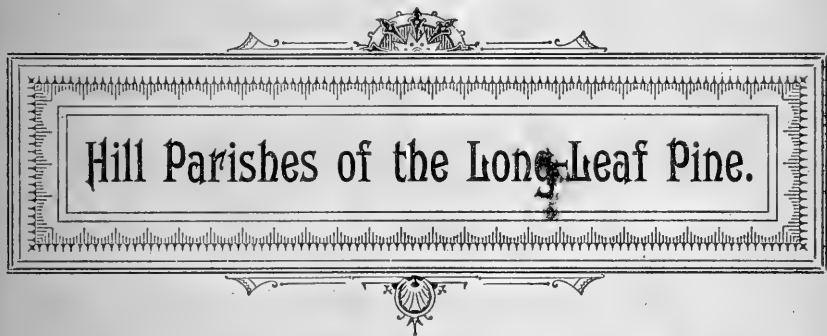
other as the pine flats, which is either coast pliocene or post pliocene, and occur either adjoining the gulf or the coast marshes of the gulf.

#### THE PINE HILLS

present a great uniformity of soil, surface features, growth and undergrowth, from Georgia to Texas. A poor, sandy soil, resting upon a pale yellow sub-soil of great porosity and depth, prevents these lands from washing into gullies. The waters that fall on them permeate them with facility, and the ridges which divide the water courses are usually broad, gently rolling plateaus, without any definite water channels between.

Wells are sometimes dug nearly 100 feet before water is obtained. These forests are so open that vehicles can be freely driven through them, and grass and other plants grow luxuriantly throughout them. Hence these lands are valuable for timber and grazing, and thousands of sheep and cattle are supported in the pine woods of Georgia, Alabama, Florida, and Mississippi, as well as in this state and Texas.

The soils on the ridges are poor and unretentive. In fact, the old settler will not make a clearing unless a notable amount of oak and hickory mingle with the pine. The bottoms are always better and these constitute the chief arable lands of the country.



Those not already described are Grant, Winn, Rapides and Vernon, in western Louisiana, and St. Helena and Washington in east Louisiana.

#### GRANT PARISH

embraces, besides the long-leaf pine hills, a small portion of the Red river bottoms, some tracts of the "central prairie" region with some level lowlands, timbered with oak and short-leaf pines. The last occupy the northeastern portion of the parish, with a heavy gray clay (Arcadia clays) mixed with small detached tracts or belts of black prairie, treeless or with scattered clumps of hawthorn, crab-apple and honey locust. These soils are badly drained and potable water is hard to obtain in the vicinity and, therefore, they are not occupied and cultivated as largely as their intrinsic merits would warrant. Some day artesian

wells and thorough drainage may cause them to be thickly settled and highly appreciated.

The second bottoms on Little river are above overflow and are highly esteemed, while the first bottoms, covered with heavy timber, are often overflowed to a goodly depth. This river is navigable the year round, as far as the junction of bayou Castor.

#### WINN PARISH

is rolling, but, rarely hilly, and consisting mainly of long-leaf pine hills, furnishes an immense area of excellent timber. In the southern portion of the parish, the slopes of the ridges are frequently covered with oaks and short-leaf pines, with the underlying subsoil of a deeper tint than usually prevail below the soil of the long-leaf pine region. On the Dugdemona and its tributaries are found tracts of good upland farming lands.

The bottoms, however, are narrow and subject to overflow and are therefore not much cultivated.

Pendarvis prairie in the fork of the Dudgeon and Castor, is of true cretaceous black prairie formation. The salt licks with salt springs or wells, underlaid by cretaceous limestone, occur in various parts of the parish. Price's lick, Drake's salt works, Cedar lick and others are notable instances of these outcrops. The cretaceous limestone hill, near Winnfield, is of the same origin and from it can be made most excellent lime, which could be used to advantage on most of the soils of the parish. At Louisville, in the northeastern part of the parish, this character of limestone comes to the surface and furnishes a small track of black prairie circular to Pendarvis prairie.

#### RAPIDES PARISH.

This parish, while classified under the long-leaf pine hills, on account of the latter constituting about two-thirds of its area, has yet a large and magnificent development of alluvial lands, which are well cultivated and thickly settled, and give immense wealth to the parish. The Red river plain runs diagonally through the parish from northwest to southeast, with an average width of about twelve miles. East and west of this plain are the gently rolling hills, with the usual sandy soil of this formation, supporting a long-leaf pine forest, with narrow but fertile hollows skirting the streams. In the southern portion of the parish bayou Cocodrie forms a great swamp. In the extreme northwestern part of the parish Holloway's prairie begins and runs southward into Avoyelles. This prairie is of bluff origin, and supports a growth of timber entirely different from that to be found on the adjoining hills. At the foot of this prairie the Red river valley proper terminates, and thereafter is mingled with the great flood plain of the Mississippi. The alluvial lands of Rapides are claimed by many as the finest lands of the state. Near the river and bayous the light, sandy, red lands prevail, superseded further off by the back lands, which are brown mahogany loams. Both of these are very fertile. Further back occurs a heavy red buckshot, hard to drain and difficult to cultivate. This is known locally as the "saltpeter" soil, and is not held in high esteem, although it is rich in the ingredients required for plant growth.

#### VERNON PARISH,

with the exception of Anacoco prairie region, is entirely of the long-leaf pine hills. The bulk of the cotton grown in the parish is in the former. This parish is at present inaccessible, and, therefore, its settlement has been only along the prairie region and fertile bottoms of its streams, the hills being as yet but sparsely inhabited, though clothed with the finest kind of timber. The headwaters of the Calcasieu, Castor and Bunkick streams furnish some wide bottoms, which are thickly settled, as also the best character of unlands surrounding them. The bottoms of the Sabine are not very extensively cultivated.

#### ST. HELENA PARISH

is cultivated chiefly along the bottoms of the smaller streams and the second

bottoms of the Amite and Tickfaw rivers. The uplands are mainly rolling, undulating pine-hill country, with the characteristic sandy loam soil, underlaid at a few inches depth by a pale yellow subsoil, changing in local spots to gray, with bog or concretions intermixed. These soils are poor but susceptible of great improvement and with excellent water and good health, the country must be thickly settled as soon as railroad facilities are offered, just as has been done in the adjoining parish of Tangipahoa, along the line of the Illinois Central Railroad. When transportation is furnished, all of these soils will, by fertilizers, be converted into truck gardens, for which, on account of their physical qualities, they are so specially adapted.

#### WASHINGTON PARISH

is almost entirely undulating pinewoods, like those of northern Tangipahoa and St. Helena, the bottoms and hammocks of the streams forming the only exception. The latter, however, furnish mainly the arable lands, the settlements being almost entirely along the water courses. Bogue Chitto, running through the center of the parish, furnishes a considerable area of cultivatable soils. Pearl river bottoms are subject to overflow, but when reclaimed, the soils are very fertile. Like similar soils elsewhere, the hill lands can be easily improved and made very fertile with proper manures and rotation of crops. Lumber, turpentine and charcoal are the products of the forest. Stock-raising is also extensively carried on in the open woods.

#### THE LONG-LEAF PINE FLATS

exist in the extreme eastern and western portions of the state. In the west, north of the pine prairies of Calcasieu parish, directly north of the west fork of the Calcasieu river, occurs a strip of pine flats nearly twenty miles wide. It is included between the pine hills and the pine prairies. The soil here is a gray, unretentive silt, underlaid by brown ferruginous concretions, resting at 18 to 30 inches upon a compact blue subsoil, full of bog, or gravels or sand, cemented into an impervious mass by clay. The roots of the pine remain above this last stratum, and hence are easily uprooted by the storms. Further north this crayfishy stratum is gradually displaced by a yellow sandy or silty loam, and the lands become more rolling, forming a gradual transition to the pine hills. In the east the pine flats of St. Tammany, Tangipahoa and parts of Livingston and St. Helena are somewhat different. A heavy gray clay underlies most of the region, which at times approaches the surface, forming cold, undrained soils, or is covered to a few inches by a silty soil of poor quality. Lake Pontchartrain is partly belted with a fair but ill-drained soil, bearing a growth of sweet gum and lowland oaks. Along the courses of the streams, notably Amite and Tangipahoa rivers, occur belts of oaks, beach, dogwood and short-leaf pine, with a brown soil, easily tilled and fairly productive, which rests upon a foundation of sandy red clay. Most of the settlements in this country are, therefore, along these bottoms. However, as pasture and for lumbering and the manufacture of turpentine and charcoal, these forests excel.



## Parishes of the Long-Leaf Pine Flats

Under this head are included the parishes of Tangipahoa and St. Tammany. The other parishes, Calcasieu, Livingston and St. Helena, in which areas of this formation occur, have been already described.

### TANGIPAHOA PARISH

is, like St. Helena in its northern part, with gently rolling pine woods, full of healthfulness and with easy accessibility to the outside world by the Illinois Central Railroad, which runs through its entire length. In the southern part of the parish the pine flats prevail. The entire parish is susceptible of wonderful improvement, as has been shown by the efforts of the large number of northern men who have settled all along the line of the above mentioned railroad and converted these lands into excellent gardens and fine orchards. The lands bordering on the Tangipahoa river are naturally fair and are capable of being improved to any desired extent. The climate and soils of this parish permit the growth of most every crop. Sugar cane, rice, cotton, corn, oats, grasses, trucks and fruits—in fact, a more varied product of the soil is now obtainable in this parish than in any other in the state. It is the great strawberry and Japanese plum parish of the state, and many hundred carloads of the former are annually shipped to Chicago and other western markets.

At Ponchatoula, Hammond, Tickfaw, Roseland, Amite, Kentwood and Tangipahoa, have been established large and prosperous farming villages, cultivating fruits and vegetables for western markets.

Many thousand western people have here established successfully "village farms" and are enjoying comfortable homes in a delightful climate, with moderate toil.

### ST. TAMMANY PARISH

is almost entirely a pine flat parish, only the margins of lake Pontchartrain and the lower lands on the Pearl river excepted.

The pine lands are like those described as occurring in the lower part of Tangipahoa parish, and are used largely for the same purposes, viz: pasture, lumber, turpentine and charcoal. The bottoms are mainly cultivated. The lowland belt fringing lake Pontchartrain is occupied by summer residences of many of the citizens of New Orleans. Mandeville and

Lewisburg are small towns, situated on the lake, and are mainly composed of houses which belong to citizens of New Orleans, who occupy them as summer homes. Covington, the county seat, situated on Tchefuncta river, ten miles from the lake, is also largely filled with summer residents from the Crescent city. A railroad connects this city with New Orleans.

### CENTRAL PRAIRIE REGION

constitutes a narrow belt, twenty to thirty miles wide, running across the state from the Ouachita to the Sabine. On the Ouachita it extends from Columbia to Harrisonburg, and on the Sabine from Sabinetown to Toledo, with a large outcrop on the Anacoco bayous, in Vernon parish, below this line. While this peculiar geological formation occupies this extended area, it covers a comparatively small portion of the surface. It occurs in isolated patches of ranging areas all through this belt, giving us distinctly two classes of prairies, viz., black calcareous prairies, covered with luxuriant grasses, with occasional clumps of wild plum and crabapple and hawthorn. These are exceedingly fertile, and give large returns when properly cultivated. The second class are known locally as the "hog wallow" prairies, which are composed of stiff, non-calcareous, intractable clays, with a rough surface, an effect produced by alternations of wet and dry weather upon this character of clay. These soils are, as a rule, poor and unthrifty, and are cultivated only in very limited areas, and with no positively profitable results. Neither of these classes have tracts more than a few miles in extent, being interrupted by ridges of long-leaf pine or oak uplands. Frequently these ridges may be underlain with prairie material, and the bottom soils resulting from the washings from these ridges may contain an admixture of clay and sand in such excellent proportions as to form very fertile and desirable soils. Surface wells, though deep and expansive, furnish a very impure drinking water, and hence have proven a drawback to the more extensive occupancy of these prairies. Artesian wells, however, will remove this obstruction. Since all the parishes included in this belt are treated of in detail elsewhere, it is only necessary to repeat here that parts of the following parishes are occupied by this formation, viz.: Caldwell, Catahoula, Winn, Grant, Natchitoches, Sabine and Vernon (Anacoco prairies).

# The Parishes of Louisiana.

## EXTENT, CULTIVATION, POPULATION.

	Area in square miles.	Acres in cultivation.	Population.	Bales of cotton.	Hhds. of 1000 lbs. of Sugar.
Acadia .....	616	61,316	13,231	1,200	...
Ascension .....	373	37,908	19,545	1,000	43,172
Assumption .....	327	36,511	19,629	200	39,569
Ayoelles .....	843	84,787	25,112	30,121	3,534
Baton Rouge, East .....	395	40,026	25,922	12,640	3,133
Baton Rouge, West .....	210	26,753	8,363	3,460	9,916
Bienville .....	856	45,048	14,108	10,256	...
Bossier .....	773	69,420	20,330	28,960	...
Caddo .....	852	95,409	31,550	25,360	...
Calcasieu .....	3,400	14,003	20,176	2,300	3,033
Caldwell .....	535	18,267	5,814	8,060	...
Cameron .....	1,545	5,743	2,825	965	...
Carroll, East .....	400	56,793	12,362	45,620	...
Carroll, West .....	380	10,071	3,748	6,124	...
Catahoula .....	1,350	29,823	12,062	13,624	...
Claiborne .....	765	126,000	23,312	25,568	...
Concordia .....	620	45,816	14,871	38,570	...
DeSoto .....	856	82,239	19,860	14,298	...
Feliciana, East .....	450	53,118	17,903	12,350	...
Feliciana, West .....	302	21,115	15,062	14,365	...
Franklin .....	550	22,104	6,900	10,230	...
Grant .....	578	24,414	8,270	7,230	...
Iberia .....	536	49,604	20,997	4,560	34,290
Iberville .....	646	42,112	21,848	1,560	48,894
Jackson .....	576	26,604	7,453	4,750	...
Jefferson .....	395	19,767	13,221	...	7,926
Lafayette .....	262	62,704	15,966	6,762	995
Lafourche .....	1,024	44,802	22,095	...	50,508
Livingston .....	575	10,467	5,700	1,505	...
Lincoln .....	485	108,084	14,753	12,362	...
Madison .....	670	48,395	14,135	25,362	...
Morehouse .....	769	57,370	16,786	26,485	...
Natchitoches .....	1,290	58,969	25,836	20,165	...
Orleans .....	187	4,436	242,630	...	2,627
Ouachita .....	640	48,847	17,985	21,720	...
Plaquemines .....	930	36,908	12,541	...	19,717
Pointe Coupee .....	575	56,594	19,613	19,367	9,156
Rapides .....	1,498	76,149	27,642	18,275	8,753
Red River .....	386	33,930	11,318	13,786	...
Richland .....	578	31,409	10,230	12,167	...
Sabine .....	1,008	18,524	9,390	3,567	...
St. Bernard .....	680	11,850	4,326	...	2,690
St. Charles .....	284	21,177	7,737	...	21,655
St. Helena .....	413	28,285	8,062	6,759	...
St. James .....	308	54,675	15,715	...	40,890
St. John .....	190	29,213	11,359	...	23,965
St. Landry .....	1,683	112,680	40,250	23,975	8,218
St. Martin .....	618	39,876	14,884	3,467	14,113
St. Mary .....	648	66,326	22,416	...	119,865
St. Tammany .....	923	3,895	10,160	400	...
Tangipahoa .....	790	21,021	12,655	3,671	80
Tensas .....	612	78,679	16,647	46,584	...
Terrebonne .....	1,806	40,403	20,167	...	48,512
Union .....	880	62,661	17,304	12,960	...
Vermillion .....	1,226	25,330	14,234	1,350	5,337
Vernon .....	1,540	16,803	5,903	2,198	...
Washington .....	668	18,224	6,700	3,672	...
Webster .....	594	42,402	12,466	8,970	...
Winn .....	954	22,548	7,082	4,230	...
<b>Total</b> .....	<b>44,426</b>	<b>2,507,935</b>	<b>1,118,587</b>	<b>622,511</b>	<b>595,473</b>

From the above it will be seen that upon been made 622,511 bales of cotton and 595,473 state is over 28 millions of acres; there is, cultivation. When all of these lands shall be good culture, what a wealth of products will

a little over 2-1-2 millions of acres there has bogsheads of sugar. The total area in the therefore, not over one-tenth of the state under occupied and the arable portion placed under be produced!

The total area of the state is 45,440 square miles of land, with several thousand acres of fresh and salt water. The land is distributed as follows:

	Sq. Miles.
Alluvial lands.....	13,255
Bluff and bluff prairies.....	5,739
Oak and hickory uplands.....	8,103
Long-leaf pine hills.....	7,582
Long-leaf pine flats.....	2,556
Central prairie region.....	785
Coast marshes.....	7,420

Such are the geological and agricultural features of this state. A state of marvelous fertility of soil, with the largest length of water courses, with splendid railroad connections, with superb climatic conditions. A state connected inland by the great father of waters with an immense territory stretching from the Appalachian to the Rocky mountains, and outward, through its mouth, with every port of the globe. A distinguished son of another state has truly said: "The northern coast of the gulf of Mexico is the natural center of trade for the western hemisphere. The configuration of the continent, the direction of the great rivers, the sweep of the ocean currents,

and the prevailing winds, all point to the mouth of the Mississippi as the natural center. There is land enough adapted to the growth of sugar contiguous to New Orleans to supply the wants of the continent and to furnish vast quantities for exportation. It only needs the proper application of machinery and labor to effect this great result. New Orleans is to be the grandest emporium of trade for the continent. When ship communication is made across the isthmus, New Orleans must become the great center of trade for North America, and nothing can divert it but an imperial despotism holding huge investments of capital elsewhere."

This prophecy is being fulfilled, and the millions of acres of land adjoining this river, and tributary to this already great emporium, must at an early day become peopled with busy millions of souls, striving in this balmy climate for the mastery of the agricultural world, as

#### NEW ORLEANS DOMINATES THE COMMERCE OF NATIONS.

To prepare for this great contest the first question to ask is:

## What Will These Lands Grow?

The general impression prevails that the south can only grow cotton, sugar cane, tobacco and rice; that other crops cannot be grown successfully, and that hay-making and stock raising are impossibilities in this sunny land.

This erroneous impression has been produced by the persistency of our planters and farmers in growing the above crops, a persistency largely inherited and acquired, with our large plantations filled with ignorant, unskilled laborers, who have been disciplined since youth in planting methods. But the climax has been reached. Planting on a large scale is no longer popular. Unreliable labor, low prices, soil exhaustion and high money rates have thorn this business of all its pleasures and most of its profits. Disintegration and division is now the order of the day, and the large plantation of yesterday will be to-morrow the abode of many happy and prosperous farms.

The question may be asked, What else can be grown in Louisiana? The reply is a sweeping one; nearly everything capable of growth in a temperate or sub-tropical country. Wheat has been, and can be, grown in the northern part of

the state. Oats sown in the early fall, and using the rust proof varieties for seed, will make as finely here as anywhere on earth. Over 100 bushels per acre have been grown on the alluvial and bluff lands of the state, while the hill lands of north Louisiana have frequently given over sixty bushels per acre. Spring oats are sometimes successful, but are not generally to be recommended. Rye and barley, if home-grown seed be used, will thrive all over the state, and are frequently sown for winter pastures. The stock are turned on during the winter, and at the beginning of spring they are removed and the grain permitted to mature, frequently with large results. Two successive crops of buckwheat have been grown in this state on the same soil in one year.

Corn can be grown easily all over the state, and if the same attention and methods of cultivation were given it here as in the corn-growing states of the west the average yield per acre would be but little under that produced there. But corn is a side issue with the cotton and cane planter, and is cultivated as little as possible. Under this "touch and go" method the yield of this state during the present year is but little below 20,000,000 bushels. By proper rotation, fertilization and cultivation, this yield could easily be doubled. Upon the al-

luvial lands of south Louisiana the sugar experimental station has for several years averaged over 100 bushels per acre upon a field of eight or ten acres. Sixty to ninety bushels have been obtained at the state experiment station at Baton Rouge upon the bluff lands, and thirty to sixty bushels are the average yields upon the rotation fields of the north Louisiana experiment station, situated at Calhoun, upon the yellow sandy loams of the oak and short-leaf pine hills.

One caution is needed in planting grains of all kinds here, that is, for a general crop use home-grown, acclimated seed. E. g., corn grown here is planted in early March and harvested in August and September, while seed from the extreme north planted at the same time will probably mature in May, and that, too, with only a partial crop. Wheat and oats, per contra, planted in the fall from seed raised in the extreme north, will not ripen before June or July, if at all (the rust frequently destroying it before ripening), while home-raised seed sown at the same time, will be ready for harvest in May. If, therefore, we desire an early crop of corn, we obtain seed from the north, and if an early crop of oats, wheat, barley or rye be desired, we send south for the seed. The reasons are obvious, when we remember that each comes to us inheriting the habits of the country from which it came. In the north the summers are short and the time of the growth of the corn is, therefore, limited. In the south, the winters are short, and, therefore, the period of repose is materially shortened and early maturity follows. This involves the whole question of acclimation. In Louisiana, under good culture, the corn crop will always be from twenty to 100 bushels per acre.

German and cat-tail millets, the sorghums, both saccharine and non-saccharine, clovers, grasses and root crops, cow peas, teosinte and other forage crops can be grown over the entire state in larger quantities per acre than elsewhere, since the tendency of our climate and the extreme fertility of our soils are to make "weed."

Vegetables of all kinds can and are grown in large quantities. Besides those grown in the north and west are many others peculiar to the south, such as okra, globe artichoke, lima beans, etc., beets, cabbage, lettuce, radishes, turnips, mustard, cauliflower, English peas, etc., are grown through the winter in open ground. In fact, every home, however humble, has its garden, in which most of the vegetables are grown. Beside these home gardens there are thousands of acres devoted to truck growing and market gardening. From the latter our own cities and towns are supplied, while the former utilize many thousands of cars in transporting their products to the western markets.

Of fruits a great variety of superior excellence can be grown here. The apple is grown in the northern part of the state. The pear, particularly the Chinese type, all over the state. The peach will grow everywhere, but it fruits best in the hill lands. The native and Japanese varieties of the plums do well everywhere. The apricot, nectarine and cherry are not successful anywhere in this state. Grapes can be grown in every parish, but succeed best in the

uplands. Black berries, dewberries and mulberries grow wild in every parish; so do the wild plums in the hill lands. Strawberries are perfectly at home everywhere, and in some sections are largely grown for the markets. Raspberries, currants and gooseberries do not thrive so far south.

Oranges, kumquats, and pomelos are grown throughout south Louisiana, while lemons, guavas, bananas and pineapples are grown on the extreme gulf coast. The loquat and pomegranate are found in nearly every yard of south Louisiana. Figs are cultivated in every parish, while in south Louisiana they are largely grown for the canneries.

No mention is made of our staple crops—cotton, sugar cane and rice—since they are inseparably connected in every man's mind with Louisiana and New Orleans.

This bare recital will show the wonderful capabilities of our soil and climate from an agricultural standpoint. Turning to the forests, we find a wealth of nature's products ready for the harvest, to be turned by man's skill and ingenuity into the various forms and shapes suitable for man's varied wants. Timber and lumber trees, stave timber, box timber, hut timber, spoke timber, tray timber, hoop timber, ship timber, bucket timber, etc., crown our hills, decorate our valleys and fill our swamps. Shade trees of the densest foliage and of most beautiful shape everywhere abound. The evergreens and deciduous trees grow side by side in every forest. The magnolia and the liveoak intertwine their boughs with the beech and the ash, while the holly and the dogwood bask in their shadows. Willows abound in our swamps, ready for conversion into charcoal or to be twisted into baskets.

Louisiana does not appeal alone to the utilitarian. Her aesthetic products are perhaps more wonderful than her useful ones. Flowers of brilliant tints and attractive forms fill her fields, her woods and her swamps. Her climate favors the growth of native flowers as well as the delicate and highly-prized exotics. Roses bloom in great profusion throughout the winter in open air, while japonicas, hibiscus and poinsettias of beautiful shades and brilliant tints are found in many yards. Tea olives and magnolias (frascata) and cape jasmines perfume the air with their delicious fragrance, while chrysanthemums, geraniums and plumbagos give brilliancy to every garden.

Palms of endless varieties furnish the center pieces of many private yards and ornament our parks and public squares.

Such in brief are the products of our soils. For the guidance of those seeking a home in our midst the following details of crops from here are given:

### CANE CULTURE.

Formerly every cane culturist was also a manufacturer, and upon every plantation of sugar cane was to be found a sugar-house of sufficient capacity to work up the crop grown. To-day the scene is changing, changing rapidly. Central factories exist—some that do not cultivate cane at all, but purchase every stalk crushed; others that grow only a part, large or small, of the large amount consumed. The presence of central factories presupposes the existence of cane farmers in close proximity. Many central factories already exist, and others



will soon be built. The fierce conflict between low-prices and profitable returns has forced out of existence many a small and incomplete sugar-house, and will ultimately drive out the remaining ones. Ponderous machines, with extensive capacities, must hereafter manufacture the crystalline product of sugar cane. It requires a large amount of cane to supply the daily demands of a large central factory; 1000 to 1500 tons per day is now a moderate allowance for the largest. Under these new conditions, the growing of sugar cane for sale to these factories is quite extensively practiced. Small farmers, with ten acres of sugar cane, can find a ready market for it, just as readily as the large planter, with one hundred times this crop. The crops of both are in demand. Until the recent removal of the bounty on sugar, growing cane by the ton for sale to central factories was quite a profitable business, and many embarked therein. The removal of the bounty occurred simultaneously with an overproduction of beet sugar in Europe, by which the prices of sugar everywhere had been greatly depressed. This combination of bad conditions has temporarily depressed the grower of cane, but it is hoped and expected that another year will bring with it higher prices for sugar, and, therefore, higher values for sugar cane. Sugar cane is bought upon a basis of values for a certain grade of sugar, and hence, when the latter is ruling low the former conforms to it in price. If, however, values are restored, no enterprise is more inviting than that of raising sugar cane by the ton for the factories. Lands in any quantity may be purchased or rented well adapted to the growth of cane. The capital required will depend largely upon the magnitude of the enterprise. One's own labor, if intelligently decided, will accomplish a great deal towards the cultivation of twenty to thirty acres of cane. Additional help will be required in planting and harvesting the crop. Good land will make from twenty to forty tons of cane per acre, and at present the factories are paying 85 cents per ton for each cent per pound that prime yellow sugar brings in the market of New Orleans. There is a large field in Louisiana for the investment of capital in central factories and for intelligent labor to grow the cane. Both will come rapidly with the return of better prices for sugar.

#### RICE CULTURE:

Formerly rice was cultivated only on the banks of the Mississippi river and its bayous, and watered by these streams. Pumps, or siphons, were used to lift the water over the walls. Upon these alluvial lands growing rice was an expensive business. A few years since southwest Louisiana began the cultivation of rice upon its open prairies. Rain water was collected by levees and used when needed upon the fields of growing rice. The bayous and coulees of this country were drafted upon for water, and pumps conveyed it to the ditches, which carried it to the rice fields. The following are their methods: Lands are broken with riding plows and pulverized with large narrow. The rice is seeded with broadcast seeders. After germination the fields are flooded. The rains are ample during the growing season, if properly husbanded, to make a

crop, and many a field is grown with rain water alone. Some large fields are flooded with water from the bayous and coulees. When the rice is mature the water is withdrawn and the harvesting is quickly performed by self-binding reapers. Steam threshing machines convert the rice into a marketable form (rough rice), which is sold in sacks to the numerous rice mills of the state, where the finished rice of commerce is prepared, with the accompanying by-products: "Rice polish," "rice bran" and "hulls." The straw is left on the fields of the farm. So cheaply and successfully has rice been grown on the prairies that they are now but little more than rice fields, and have driven the alluvial planters out of the business. Louisiana grows to-day four-fifths of the crop of the United States, and by its present methods of culture is reaping a goodly profit.

#### TOBACCO GROWING.

The oak and short-leaf pine hills, and the long-leaf pine country are eminently adapted to the growth of the forest type of yellow leaf tobacco, which is now in such large demand for plug wrappers and smoking tobacco. Experiments at the north Louisiana experiment station have so conclusively demonstrated this fact that many of the farmers of the country have embarked in its cultivation, and a plug and smoking tobacco factory has been established at Calhoun, with a capital of \$25,000, which is now busily engaged daily in its manufacture. This factory will purchase the tobacco directly from the grower, and thus save freight to market and commissions for selling. Similar factories will soon start all over north and east Louisiana. At Hammond, in eastern Louisiana, similar field experiments to those conducted at Calhoun have been successfully made, and confirms the opinion previously entertained of the adaptability of the pine lands of the Florida parishes of Louisiana to the growth of the yellow leaf tobacco. In growing tobacco care must be taken to grow the best, since the inferior articles have small values. The process of curing is by the "new barn" of Captain W. H. Snow, and is accomplished in about three days. This yellow leaf tobacco was sold by the station to Lorillard & Co., New Jersey, for 45 cents per pound, and at such prices gave a very profitable return.

On the alluvial bluff and prairie lands of the state it is best to attempt the growth of the cigar leaf tobacco. Experiments at Baton Rouge and Audubon park give promise of success in this direction. Some fine cigars made from tobacco grown at Baton Rouge have been tested by the writer, and it is thought that experience would improve the quality and quantity of the product. At Calhoun as much as 1600 pounds per acre of bright yellow leaf have been produced. In south Louisiana, with the cigar types of tobacco, the yield has reached over 2000 pounds. It is usual to obtain two crops a year from the same planting. This is accomplished by leaving a sucker in the axil of the lower leaf when topping the plant. When the leaves of the first crop are gathered, the old stalk is removed and the young sucker soon takes its place and with favorable seasons makes nearly as large and fine a crop as the first one.

Tobacco growing is one of the coming industries of the state and soon our factories will be supplying the states west

of us with smoking and chewing material. The following are the opinions of the leading tobaccoist of this country upon the merits of our yellow leaf:

Carr & Richardson, manufacturers, of Richmond, Va., write:

"We pronounce it as fine in quality and texture as the best average of the best section and among the best and most skilled planters in North Carolina. In short, we think its quality could hardly be excelled. \* \* \* You have as clear color for the ripeness and quality as we have ever seen. We have seen cutters and light press wrappers of a fraction better color than this, but the white yellow was at the expense of its chewing and smoking qualities. The samples you sent are what we pronounce the ideal cigarette stock, excepting the heavier bundles, which is a light press wrapper. \* \* \* Our advice to you, if you continue to make tobacco, is to make the very best, like the samples sent, getting as much off an acre as possible, and then securing a second crop if possible."

These gentlemen write further that it is their opinion that no other country could successfully compete with Louisiana in raising tobacco, owing to our long summer, which insures a ripe crop, which is not always the case in Virginia and North Carolina.

From P. Lorrillard & Co., New Jersey, the following was received:

"We beg to acknowledge receipt of your favor of the 14th ult., also type samples referred to therein, which we have carefully examined, and note with pleasure the success attained in the growing and curing of bright tobacco. As indicated by these types, the soil is evidently well adapted to the growth of bright tobacco, and with a proper knowledge of curing and handling the same we believe the farmers of your state will find tobacco raising a profitable industry."

Pemberton & Penn., of Henderson, N. C., wrote: "It cannot fail to bring a good price."

G. W. Smith & Co., manufacturers, Lynchburg, Va., write:

"We were quite interested in examining your samples and surprised to see such tobacco from Louisiana. It is a valuable crop, and if exhibited in any market in Virginia and North Carolina, in proper condition, would command prices that would probably be very satisfactory to you."

Messrs. J. P. Taylor & Co., Danville, Va., write: "We are sure it will bring you a good price."

Mr E. J. Parrish, of Durham, N. C., says: "Samples received. They show to be very good stock and worth from 15 to 30 cents per pound."

The Addison Tinsley Tobacco Company, of Louisiana, Mo., write: "We find on examination, your samples to be a very good quality of wrappers. We cannot make an intelligent bid without knowing proportion of long and short wrappers, but lumping the lot, we make you an offer of \$20 per 100 pounds on the entire lot."

#### GRASSES, CLOVERS AND FORAGE CROPS.

Throughout the entire south two well known grasses furnish pastures and hay of the best quality, and in practically large abundance. These are Bermuda (*Cynodon dactylon*), the finest pasture grass in the world, and crab grass (*Panicum sanguinale*), which springs up in every cultivated field in early spring, and if not disturbed will furnish a large cutting of excellent hay in summer. These grasses grow all over the south, and, in the past, have been considered our worst enemies.

In south and middle Louisiana, upon the alluvial plains, bluff and pine lands, occur many varieties of paspalums, several of which are highly esteemed, both for hay and pasturage, viz, *P. distichum* and *P. plalycaule*. These are known by the Creoles as gazon and by the Americans as carpet grass.

A fox-tall grass (*Setaria glauca*) also grows luxuriantly all over south Louisiana, and furnishes a fairly good hay and pasturage.

In north and middle Louisiana, and even upon the pine hills and flats of east Louisiana *tespedeza stuata*, Japan clover, covers every available space of unoccupied ground, even in the forest, affording excellent grazing throughout the summer for stock. When cultivated, particularly upon the bluff lands of the state, it makes large crops of a very palatable hay. Many thousands of acres are now annually grown, and a number of colts and calves are raised exclusively upon it. It is especially luxuriant upon the bluff lands, and is there worthy of cultivation. In the alluvial lands it has not been given extensive trials.

The varieties of grasses cultivated successfully in the north should here be tried only on a small scale, since experiments so far conducted have proven them to be, in many cases, unprofitable. The first essential for successful growth of grasses and clovers is to sow them in the early fall upon well prepared seed beds. They spring up at once and get sufficiently rooted by spring to resist the encroachments of the native grasses, and withstand our long summers, the chief obstacles to successful grass culture all over the south. The best cultivated grasses are the following:

Tall meadow oat grass (*Arrhenathrum avenaceum*), planted in early fall upon good, well-pulverized soil, will secure a good start by spring and make one or two cuttings of hay during the summer. It will last for several years, and affords an excellent pasturage. It has succeeded on the alluvial, bluff and oak uplands. One bushel (fourteen pounds) of seed required for an acre.

Italian rye grass (*Lolium Italicum*) sown early in the fall upon rich, moist land (not wet) will afford two large cuttings of excellent hay. The first cutting must be made before it flowers, since this grass is an annual, and after seeding dies; forty-five pounds of seed required for an acre. Succeeds everywhere on good, moist soil.

Rescue grass (*Bromus shraderi*) sown in the first cool days of the fall upon well-prepared, fertile soils, will give excellent results. Cut before it goes to seed, it will give two crops of hay. The last cut (after the seed are matured) will drop enough seed to reseed the ground the next fall. A good annual for this climate, and, if properly managed, will make a perpetual winter grass.

The following have been partial successes: Red top (*Agrostis vulgaris*) on damp, low soils; orchard (*Dactylis glomerata*), on good soil; English blue grass (*Festuca pratensis*), especially in shady, damp places; velvet grass (*Holcus lanatus*).

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tus), Kentucky blue ragss (*poa pratensis*), on good soils containing lime, and crested dogtail (*cyrtosar rus cicutatus*).

The following new and imported grasses have been very successful, but the seed are difficult to obtain:

Hairy oat (*avena sterilis*), growth like common oat (*avena saliva*), and is an annual, Japanese rye (*agropyrum japonicum*), a perennial of great merit, growing through the fall, winter and spring and eaten greedily by stock.

*Bromus pinnatus*, a coarse, rank grass, growing mainly in winter; *phalaris coerulea*, a summer grass of great merit, and *panicum palmeri*, a summer grass of wonderful growth and strong reproductive power, with large, wide blades and full seed heads.

*Bromus inermis* has succeeded upon dry, rich soils. Texas blue grass, propagated best from roots, is strongly recommended for high lands as a winter pasture.

It must be remembered that no cultivated grasses will succeed upon poor, badly prepared soils; therefore, in going into grass culture prepare lands thoroughly by growing first crops of—

Clovers, cowpeas, vetches or alfalfa, which prepare the soil for all kinds of graminaceae. Of the clovers: White clover grows in great luxuriance naturally all over the bluff and alluvial lands of south Louisiana. It furnishes an abundant pasturage in winter and early spring.

Red clover can be grown anywhere in the state, provided the soil be first enriched and sown in early fall. It is, however, not so certain a crop as common clover, which, when sown in the fall upon fairly good soil, will nearly always give a remunerative return of hay. It is an annual, and the seed must be carefully harvested each year for reseedling, since those dropped by the plant germinate at once and are killed by the heat of the summer. This clover is particularly to be recommended upon the light lands of the state, as the clover best adapted to them, but it would be better even here to grow and turn under a good crop of cowpeas before seeding the land in it. Alfalfa (*medicago saliva*) is especially applicable to the rich alluvial bottoms of the state, or to very rich uplands. It should be seeded in September or October, at the rate of fifteen pounds per acre. The land should be well drained and deeply plowed and well pulverized. If a good stand be secured as many as eight cuttings per year may be obtained. It will, if properly cared for, last several years. It is the only crop on our bottom lands that will occupy the ground throughout the year.

Lathyrus—Of the three varieties, *sativus*, *silvestris* and *hirsutus*, which have been tested, only the last is to be recommended. It springs up in the late fall, grows through the winter, fruits in the spring and dies. From the seed dropped, it springs up again the next year.

Vetches—*Vicia villosa*, sown in the fall, have given fairly good results. The other species have not proven successful.

Soja beans (*geyocne hispida*) have done well upon the light hill lands of north and east Louisiana. Elsewhere in the state they have produced good vines, but little fruit.

California, or burr clover (*medicago maculata*), grows well all over the state, but it makes an inferior hay not generally relished by stock.

Beggar lice, or ticks (*desmodrum molle*), grows luxuriantly most anywhere in the state, and when cut young gives a hay which is greatly relished by stock.

Spanish Peanuts—This plant is now largely grown for forage. The vines, with their adherent pods, are cured into hays and fed to all kinds of stock. They also are great soil improvers.

#### GERMAN AND GOLDEN WONDER MILLET

have been grown successfully all over the state. For hay purposes it should be cut before it forms seed.

Cowpeas (*dolichos sinensis*) is the "boss" crop of the southern states. It can be used as a soil restorer, a hay crop and a grain crop. There are many varieties—some bunch and some runners. When the berries are desired for food the former is best used; when hay or soil improvement is desired the latter subserves our purposes. The early, red tory, black and unknown are running varieties. The last is perhaps the best pea known, making a large quantity of vines, and, late in the season, a full crop of berries.

There is not a well-drained acre in the state that cannot, by the application of mineral manures, in conjunction with the growing of cowpeas, be made very rich. All rational farming involves a system of rotation of crops, and any rotation of crops in the south that omits the cowpea is an egregious blunder.

#### SOILING AND FORAGE CROPS.

The saccharine sorghums are perhaps to be preferred to all others. Planted in early spring, two or more crops can be cut during the year. All stock relish them and at least 6 to 10 tons of dry fodder may be had at a cutting.

Next to these come teosinte (*trianx luxumaus*), which on rich land gives an immense crop. Of the non-saccharine sorghums the yellow millo maize is probably to be preferred, if forage is desired, followed by white millo maize, large African millet, Kaffir corn, Jerusalem corn, Egyptian corn and wheat. If seed be desired the large African millet and Kaffir corn will give the best results.

Pearl millet (*penicellaria specala*), is used largely for soiling in the spring and fall.

#### VEGETABLES AND FRUITS.

All of the leading varieties of vegetables are grown all over Louisiana. Except around New Orleans and along the lines of our leading railroads, they are grown only for home use. However, the aggregate of trucks raised for market in this state is enormous and is constantly on the increase. Most of our railroads now furnish quick transportation in refrigerator cars. Around New Orleans and along the Illinois Central Railroad the bulk of the vegetables and fruits for market is grown. Immense quantities of cabbages, onions, tomatoes, beans, peas, strawberries, Japanese plums, canteloupes, etc., are shipped every day during the season. Cucumbers and eggplants raised both under glass and in the open air are special subjects of profit, and are grown in great quantities. In the parish of Tangipahoa are many thousand acres of strawberries, which return yearly many thousands of dollars to the owners. Japanese plums and persimmons, Le Conte and Keiffir pears are also raised largely and perfectly here, and can be successfully grown everywhere in the state. The country along the line of the Illinois Central Railroad is especially adapted to truck gardening and fruit growing. So, too,

with the lands adjacent to the Yazoo and Mississippi Valley Road, north of Baton Rouge, and the hill country on the Vicksburg, Shreveport and Pacific Railroad, west of Monroe, and on the Texas and Pacific, above Alexandria. Near Wilson, La., on the former road, are large truck farms, which, though recently established, promise to be very successful. On these farms immense quantities of tomatoes were grown last year and shipped to western markets.

Besides the vegetables named, grown in special localities for market, may be mentioned the Irish potato, which has become in this state a staple crop and grown in most every parish for market. Planted from December to February, they are harvested from March to June, and reach the markets in turn to command the highest prices of spring. By planting again in July or August a second crop is obtained in the fall, which can be shipped or used for seed in the winter or spring. Hundreds of thousands of barrels of Irish potatoes are annually shipped from this state to the markets of the west and north, always with fair returns. New Orleans and Baton Rouge are the chief centers of collection and shipment. Watermelons of large size and of delicious quality are raised all over the state for home purposes and local markets, but as yet few are shipped to a distance. Apples are not grown extensively anywhere in the state. Apricots and nectarines are not a success anywhere. Peaches do well in the hills of north Louisiana, and many varieties of this luscious fruit are grown throughout this section, both for home consumption and for markets.

Grapes do well also in this section as well as the hill country of east Louisiana. Certain varieties, with proper use of fungicides, can be made to grow anywhere in the state, but the grape sections are those given.

Strawberries are wonderfully successful in the hills and pine flats of the state, and are grown elsewhere also, but with additional risk and cost of keeping down the grasses and weeds through our long summers.

Blackberries and dewberries grow wild in great profusion all over the state. Raspberries, currants, gooseberries and cherries are not successfully grown in this state.

Of pears, only the Chinese type, Le Conte, Smith, Garber, Von Seebold, Keifer, etc., are extensively grown. The French type, so largely cultivated in the north, is not grown successfully there. So, too, with plums, only the Japanese varieties and our native plums will grow. Some varieties of the former are great successes, both in growth of trees and size and quality of the fruit. The Botan, Burbank and several others are highly esteemed.

Figs of excellent quality are grown throughout the state. In south Louisiana several preserving factories take annually at good prices the product of many fig orchards.

Pomegranates and olives can easily be grown in the southern part of the state, while pecans, indigenous to the state, are now grown in extensive groves all over the entire state. Many improved varieties are now being grafted or budded upon the common pecan, and the fruit from them is greatly improved in quality and fetches much higher prices. This nut is now a source of a large income to many

of our people, and in the near future will be one of the chief products of the state.

## SWEET POTATOES, CONVOLVULUS BATATA (LINN.) BATATAS EDULIS CHOISY.

This crop is universally grown throughout the south. It is a popular root, found on the table of the rich and the poor. The state of Louisiana is credited with a crop of 3,000,000 bushels, large quantities being grown in every parish and upon every variety of soil. While most of this crop is consumed at home, increasing quantities are annually finding their way to northern markets at remunerative figures. As much as 1000 bushels per acre have been grown in this state and crops of 300 to 500 bushels are frequent. It is also highly relished by stock of all kinds. The cattle and horses are frequently fed upon the harvested roots, while hogs are nearly always permitted to root for those which are overlooked in gathering. Thirty-six varieties, including five new ones, recently received from Java, have recently been tested by the state experimenting station at Baton Rouge and the following concluding remarks are taken from a bulletin reporting the results:

By far the greatest acquisition in sweet potatoes obtained so far is the Vineless. It is very easily cultivated, prolific, early, keeps well, and has high table qualities, making it one of the most desirable varieties of our whole list. This is our choice for first place. The next variety demanding especial attention is the Providence, noted above all others for being prolific, and at the same time being well suited for either the table or stock. It does not keep so well as the Hayman or the Southern Queen, but has better table qualities.

For late spring use the Hayman serves well. There are other old sorts which are desirable and popular, namely, the Georgia, Spanish yam and the Nausemonds (for northern markets). But the Vineless, Providence and Hayman offer such additional advantages that it seems in our judgment they will give more and better returns for labor expended.

## ORANGE-GROWING IN LOUISIANA.

Formerly it was supposed that only the extreme southern portion of Louisiana could grow oranges. In fact, little or no effort was made prior to 1880. Seeds from sweet oranges were planted in some corner of the yard, garden or lot, and when germinated permitted to grow unaided by cultivation, pruning or fertilization. In the course of time the straggling, neglected trees bore fruit—delicious fruit—for home uses. Thus a home knowledge was obtained of the character of Louisiana fruit, but so few found their way to the outside world that the latter knew absolutely nothing of their merits. The neglected, enfeebled trees were frequently killed by cold, by insects or by diseases. The rapidity with which orange trees under such adverse conditions, were destroyed, soon engendered a popular sentiment that oranges could not be profitably grown in Louisiana. This opinion has, however, been now almost entirely dissipated. Profitable orange groves are found all along the gulf coast, and these groves receive careful cultivation, pruning and removal of

insects. Since 1880 one grove of 160 acres, planted in sweet seedlings, has brought to its owner \$257,000 for the fruit on the trees. The Italians buy the fruit on the trees and then gather them and ship to market. Since 1880 a decided change has come over our orange gardens.

The sweet seedling is used now only to furnish buds for insertion and growth upon the hardier stocks. The sour and bitter-sweet oranges, the rough lemon, the grape fruit and the citrus trifoliata all now furnish stock for our groves. The sour orange is hardier than the sweet and will endure a much lower temperature without injury. The citrus trifoliata is very hardy, standing the climate of Philadelphia. It is dwarfish in its habits, and, therefore, is to the orange what the quince is to the pear. By budding on this stock, small trees are obtained which may be planted closer together in the orchard. Like the dwarf pears, they bear earlier than the standards.

New varieties of oranges have been introduced from all over the world; some of these, notably the Japanese contributions, are very hardy. The Satsuma, the Kewachal, Dai-Dai, etc., all grow and bear fruit up to the central portion of the state. The first when budded on the citrus trifoliata is very hardy, enduring, perhaps, the greatest cold of any citrus fruit. This combination is now sold largely for growth in half-barrels in northern conservatories. Frequently a tree thus treated will in three years bear over 100 oranges. It may, therefore, be asserted, with our present knowledge of oranges, that successful culture of this fruit can be carried on all through south Louisiana, provided proper attention be paid to the following.

First—Selection of the hardier varieties upon the hardest stocks.

Second—Windbreaks, natural or artificial, upon the north and west of the grove.

Third—To shade each row upon its eastern side.

Fourth—To provide temporary means of mitigating the cold (which comes with severity only for a day or two) by fire, smoke, smudges, etc.

Rows of olives (much hardier than oranges) have been suggested for the accomplishment of the third object.

These precautions are given for the guidance of those who propose to locate groves above the city of New Orleans. Below the city little or no danger is apprehended to an orange grove from cold. These precautions are necessary in most every orange-growing country. Florida and California both suffer occasionally from freezes and many thousands of dollars have been spent in both states for the protection of groves from cold.

The following directions are given for the guidance of those proposing to start a grove:

#### SELECTION OF LAND

is of first importance. After selecting the locality look well to the character of the soil. Its physical and chemical properties should be examined. Drainage is of the first consideration, and your soil should be naturally or artificially relieved of any superfluous water. Open ditches and tile drains are both used for this purpose; the latter has been found to be very efficient, when properly laid.

Select no piece of land for an orange grove that the bottom, or ground, water cannot be held at least three feet below the surface. After selecting your ground have it well broken in the late summer, or early fall. If a crop of cowpeas could be turned under it would be better. The best time to plant here is in December and January.

#### HOW TO START A GROVE.

Two ways of doing this, first by direct purchase of trees from some reliable nursery and plant the entire grove at once, or, second, by procuring a large quantity of sour oranges or fruit, of the citrus trifoliata. From these obtain the seed and plant the latter in nursery rows, 5 feet apart and 4 inches in the drill. Cover about 1 to 2 inches deep. They will quickly germinate, and if properly worked and fertilized will be ready for budding the next spring. Buds of any variety at very low figures can be obtained of any reliable nurseryman. In two or three years, with proper care and skill, enough trees will be obtained to plant out the entire grove. The first way will insure an early grove, but at greater expense. The second is slower but much cheaper, and will, in the end, prove more satisfactory. Good one-year buds on sour or trifoliata stock can now be bought for from \$15 to \$40 per thousand.

#### HOW TO PLANT A GROVE.

Use only, in this climate, sour or trifoliata stock, and plant only strong, well-grown trees. The distance apart in the orchard will depend upon, first, kind of stock, and, second, variety of oranges used. If Satsumas, Tangerines, Mandarins, etc., are budded on some stock, they should be planted at least 15 feet each way; 20 feet would be ultimately better. If on trifoliata 10 to 12 feet each way will do. The sweet oranges on some stock should have from 30 to 40 feet each way—on trifoliata 15 to 20 feet each way.

Lay off lands in beds of desired width, open holes (large and deep) at proper distances, and plant trees, in the latter so that the crown roots will be just at the surface of the ground, and at no time during subsequent cultivation must they be covered deeper. This is a most positive requirement for success in orange growing in alluvial lands.

#### WHAT VARIETY TO PLANT

will depend upon the pleasure of the grower and the demand of the markets. As a rule, early varieties sell best, therefore, an orchard for profit should have a large majority of early ripening varieties. The Satsuma, the mandarin, Boone's Early, Parson Brown, Sweet Saville, Brazilian, Baldwin's No. 1 and many of our Creole seedlings are quite early. The tangerines, navels and some of the Bloods follow next, while Hart's Tardiff, Rivers' unknown, etc., are late bearers. It should be remembered that all oranges ripen earlier here than in Florida or California. The sugar experiment station at Audubon park, New Orleans, has over 100 varieties under cultivation and the merits of each are being studied.

#### CULTIVATION OF GROVE.

Shallow cultivation with plow and cultivator is practiced by many. Some sow

the grove each year in cow peas and turn the latter in late in the fall. Alfalfa sown in October upon alluvial lands will occupy the ground to the exclusion of weeds for several years and afford several cuttings of fine hay each year. Crinson clover (an annual) sown in October may also be used. Others cultivate vegetables between the trees, particularly when young, and make the profits therefrom bear the expense of the grove until the latter bears a profitable crop. While, lastly, others prefer clean culture the entire year.

#### FERTILIZATION OF GROVE.

The rich alluvial lands of the southern part of the state will grow fine, thrifty trees without fertilization. After bearing several heavy crops, fertilization may be necessary. However, every orchard does better by proper manuring. The young trees require growth and therefore need large additions of nitrogen. A mixture of two parts of cotton seed meal and one part of acid phosphate will meet their requirements.

Later on, when the tree begins bearing, equal parts, with, perhaps, the addition of one-fourth potash salts will do better. A tree one year old should receive about one pound of above fertilizer scattered around it in a circle whose radius equals the height of the tree, and lightly plowed or raked in. For every year after the amount applied should be doubled, viz: two pounds for two years old, four pounds for three years old, eight pounds for four years old, sixteen pounds for five years old, etc., until you are satisfied from the growth and yield of the tree that a maximum quantity has been used, after that apply this quantity.

Before the orchard is old enough to bear fruit, every grower will have posted himself as to best methods of gathering and shipping. In planting the trees, do not let their roots get dry or even exposed to the sun, and cut back the top to the point at which you wish it to branch. It is yet uncertain at what height it is best to have it branch, though all are agreed that very high branching is a disadvantage.

The above details are given because of the conviction of the adaptability of a large amount of south Louisiana to orange growing and of the profits involved in orange planting here. The writer sold, a few days ago, to an Italian the first fruit upon six trees, not quite three years from the bud, for \$15. Louisiana oranges, coming in earlier than those from Florida, find nearly always a good market right at home, and hence profits larger than elsewhere. Our soils require neither fertilization nor irrigation, though both would insure larger and better crops.

Immediately on the gulf coast, anywhere from the Sabine to the Pearl river, all varieties of oranges can be successfully grown. At present the chief locations of extensive groves are on the Mississippi river below New Orleans—in lower Vermillion, on lake Arthur and Shell Beach, and in Cameron, all along the coast, but especially on Grand Cheniere. Elsewhere orange growing has been suppressed by the larger industries of sugar cane and rice, rather than of the inadaptability of the country to orange culture.

▲Above the latitude of New Orleans, the

hardest varieties should be planted, and these upon sour or trifoliate stock, while middle Louisiana may successfully grow some of the Japanese varieties. (Satsuma, Kewachai, Dai-Dai, etc). There are thousands of acres all through southern Louisiana that might be very profitably turned into orange groves.

The scale insects (red and purple), which are everywhere troublesome to orange growers, can be kept in subjection, or entirely destroyed, by proper application of kerosene and rosin emulsion. The experimental station has published a bulletin on orange culture, giving complete instructions for the destruction of these pests.

#### FIBER CROPS.

Ramie (*boehmeria nivea*), which furnishes a fiber nearly equal in value to silk, can be easily grown all over the state and nothing is needed to make it a leading crop in Louisiana but a successful machine to decorticate it.

The recent trials of machines for decorticating this plant, at the sugar experimental station, Audubon park, New Orleans, gave promise of an early solution of this vexatious problem. When the farmer can obtain a machine to work up the product of his soil, he will not be slow in cultivating this plant, since the demand for this fiber is practically unlimited.

So, too, with jutes (*coreborus capsularis* and *oltorius*), the fiber from which is used to make grain sacks and cotton bagging. These plants can be grown to great perfection and will be largely cultivated when the fiber can be successfully detached by machinery.

Kentucky hemp (*cannabis sativa*) can also be grown successfully upon the alluvial lands of the state.

#### STOCK RAISING.

No portion of the globe is better adapted to stock raising than the state of Louisiana. Our soils, unaided, will supply native grasses sufficient to maintain cattle and horses through at least nine months in the year. The great variety of grasses, clovers and forage crops which can be grown so successfully upon all of our soils; our short winters, requiring shelter and extra feed for only a few months in the year; our numerous water courses, with their infinite number of tributaries, furnishing an abundant supply of water at all seasons, all conspire to make Louisiana a most desirable location for stock raising. The question may be asked: If these natural advantages exist, why is it that more have not engaged in this industry? The ready reply is found in the fact that heretofore our entire agricultural world has been absorbed in the growing of our leading staples, sugar cane, rice and cotton. Another potent reason may be found in the absence of packing factories, where a ready market for cattle, sheep and hogs might be found the year round. Both of these reasons are now gradually melting away. Sugar cane and cotton no longer afford the handsome profits of the past to the planter, and the latter, particularly the cotton planter, is now diversifying his crops and paying more attention to the raising of stock. A large majority of the horses of the state have been raised at home. Mules have been raised in sufficient quantities to demonstrate that

with proper care and attention, the finest and largest can be grown here, but only in a few instances has mule raising been pursued as a profession or special occupation. The question of packing factories is now being discussed all over the state, and the city of Monroe has taken the initiative by organizing the first corporate body proposing to establish such a factory. Assurances are given that this factory will be in successful operation by another year, and with its establishment new life will be given to the farmers of north Louisiana, whose experience in stock raising justify the belief that under proper management, they can grow hogs and cattle as cheaply as anywhere else in the world. Packing factories are needed also at Shreveport, Alexandria, Lake Charles, Opelousas, Baton Rouge and New Orleans and elsewhere, and capitalists will find this field an inviting and profitable one for the investment of surplus capital. Farmers will grow the hogs and cattle as soon as they are assured that near markets can be obtained for them.

### CATTLE RAISING

on the ranch system was once largely practiced in the prairies of southwest Louisiana and the profits were large. This industry has been destroyed by the private entry and occupancy of all these prairie lands by sturdy settlers from the northwest, who have transformed them into beautiful homes and prosperous farms. The raising of cattle, improved cattle, by farmers is now the question for solution. Many are essaying it with success. Improved breeds have been introduced and tried. The Jersey has so far been the most popular breed. Many excellent cows of this breed are to be found all over the state, and the tables of many a farmer is daily supplied with gilt-edged butter made on his own farm. The Devons have also been successfully tried, and the opinion is fast growing that "for all-round purposes" it is the best breed for the small farmer to grow. The Guernseys have been tried to a limited extent and are quite popular. The Holsteins, short-horns and Herefords have also been experimented with, and upon rich alluvial lands, where "long-croppings" of grass can be obtained, they do well. Upon uplands, prairies and pine woods the smaller breeds are to be preferred. There is one serious drawback to southern cattle raising, which will be overcome by the establishment of packing factories in the south, i. e., the southern cattle fever, known also as the "Texas fever," "Spanish fever," and, locally, as "murrain," "red water," etc. There is an imaginary line running down the Atlantic coast south of Richmond, Va., through North Carolina, South Carolina, Georgia, Alabama, Mississippi, Arkansas and Texas, which marks the limit of the infected district. Louisiana and Florida are wholly in this district. All cattle brought from above this line into this district are subject to this disease, which is alarmingly fatal. Native cattle, raised below this line, while really healthy, carry along with them the seed of the disease and convey them to the cattle with which they come in contact. Hence, a national quarantine is established by the United States government against all cattle going from this section to northern markets during certain months of the year. It has been

definitely determined that the vehicles of transmission of this disease is the southern tick—*boophilus (ixodes) bovis*—and our southern cattle carry them on their bodies when transported elsewhere. These ticks drop from them in the cars, on the pastures, or in the stable yards, and afterwards, reaching other cattle, inoculate them with the virus of the southern fever. The bureau of animal industry at Washington has published many interesting investigations upon this line in their reports, to which the reader is referred for details. This quarantine has seriously militated against general cattle raising in the south, since all our markets and packing-houses are north of us. Could packing-houses be established in the south, this embargo would be virtually removed, and a great impetus would be given to cattle raising.

Conversely, it is found that nearly every head of cattle imported from the north to the south suffers the first summer afterwards from an attack of this fever. Of the number attacked a large number die. The amount of money spent in the south since the war by the loss of imported cattle from this disease, would endow liberally a bureau of veterinary science for the special study of cattle diseases. It is, therefore, in order here to caution all persons against the reckless importation of high-priced cattle from the north into the south. If cattle must be imported it would be best to do it when they are calves or yearlings, since at this age the disease is not near so virulent.

### FATTENING CATTLE FOR MARKET.

Immense numbers of cattle are now annually fattened throughout the south at the numerous cotton seed oil mills. It has been found that a mixture of cotton seed hulls and cotton seed meal will rapidly fatten cattle for market. This knowledge has enabled the oil mills to utilize their hulls, which were formerly used as fuel under their boilers, as a supplement, in feeding, to cotton seed meal, and a much higher value is thus obtained from them. Most of the mills which feed these cattle utterly neglect one of the chief profits of feeding, viz: the proper saving of the manure or drippings of the cattle, which, to the small farmer, would be of great value. Hence the expediency of the small farmer, particularly the cotton farmer, who can easily exchange his cotton seed for hulls and meal, buying annually from ten to twenty head of cattle and feeding them systematically through the winter, carefully husbanding the manure and applying to his soil, and selling the cattle as fat beeves in early spring. This practice, if skillfully manipulated, would furnish profitable employment to the farmer during winter, when he would otherwise be comparatively idle, and at the same time furnish an abundance of manure for his fields and save the amount now expended in the annual purchase of commercial fertilizers. Another benefit would be the utilization of the "roughness" of the farm, which would improve the above ration and increase the value of the manure. That this can be profitably done and that stock-raising of all kinds can be successfully carried on, the following letter from Mr. F. L. Maxwell will prove. Mr. Maxwell is a native of Indiana, has been living south since 1867,

is a large planter and a man of high intelligence and probity. He is well known to the writer, who will vouch for the truth of every assertion in the letter:

#### FEEDING CATTLE IN LOUISIANA.

MOUND, La., Oct. 29, 1893.

Dr. W. H. Dalrymple, Baton Rouge, La: My Dear Sir—Complying with your request of the 9th inst., I will give you the benefit of my limited experience in feeding cattle in Louisiana. I have fed a few head of cattle nearly every year for the past ten years. I have used corn meal, cotton seed, pea hay, turnips, pumpkins, cabbage leaves and sweet potatoes, all with success. All of the above can be raised very cheap on our southern farms and all can be used in feeding cattle, hogs and sheep with success. In connection with the above I would recommend to farmers that have facilities for shipping at cheap rates, to sell their cotton seed and buy hulls and cotton seed meal instead.

I made the following test this year on cotton seed hulls and meal alone: I purchased twenty-six tons of cotton seed hulls and five tons of cotton seed meal, the former at a cost of \$3 90 and the latter at \$22 per ton delivered. The above was all fed to twenty-three head of steers in forty-three days; the gain per head, per day, was three and one-half pounds. I was offered 2 cents per pound gross for the cattle the day they were put in the lot; at the end of the 43d day I shipped them to market and sold them at 4 cents per pound gross. I knew of other gentlemen that have had more experience in feeding than myself, and they have made plenty of money, but on land that they could not raise more than fifteen to twenty bushels of corn they are now raising eighty bushels of first-class corn and good crops of peas on the same land.

The farmers of Louisiana ought to raise their own horses, mules, cattle, sheep and hogs, and can do so with greater profit than farmers in the northwest. They have advantages in climate and soil, and can raise so many things in abundance and so cheaply that our northern brothers cannot raise. I would recommend our Louisiana farmers to try a few head of good steers or cows and prepare plenty of food crops, and then feed hulls and cotton seed meal with it; they will be surprised to see how quick they can fatten the cattle and what profit there is in it besides the rich fertilizer they make clear if they will only save it. After experimenting with these things I am thoroughly convinced there is money in it. I am preparing large pastures, and am now buying all the cattle I can with a view of feeding on a large scale. I know of a gentleman in Illinois who has just invested in a large tract of land in the Tensas river swamp and fencing it, and will put 600 head of cattle in it at once.

In regard to feeding horses and mules while at hard work, I have had splendid success with cut oats, ground corn and peas mixed, two parts of corn to one of peas. I would advise all farmers to raise plenty of oats and feed less corn. I cut my oats with a large ensilage cutter and

use a three-horse tread-power. In regard to raising mules, I think I can safely say it is a success. I have them from sucking colts to 5 years old, and am pleased with the experiment. I have 19 colts this year. I will add that I always feed my mules and horses when at work, three times a day. Hoping that you may find something that will prove interesting to you in the above, I am yours truly,

F. L. MAXWELL.

#### RAISING HORSES AND MULES

have already been referred to. In this climate, with proper pastures and forage crops, mules and horses can be raised very cheaply. Before attempting it on a large scale a portion of the land must be put into permanent grass or clover pastures; another portion must be utilized for the growth of forage for their maintenance during our short winters. Mules are especially adapted to our climate, and thousands are bought annually by our sugar and cotton planters from the western farmers. They can more easily and cheaply be raised at home. From the number of jacks now being imported into this state, it is fair to infer that hereafter a much larger number will be raised.

The Percheron and Clydesdale horses have not yet found favor in this state outside of New Orleans. The mule being the draft animal, the horse is desired more as a roadster, or for the saddle. Therefore, the smaller trotting or riding stock are in larger request and are chiefly grown.

#### SHEEP RAISING

has been done heretofore mainly upon the ranch system. A few farmers have kept a small flock for their home supply of mutton. As a rule, it would pay every farmer to keep a small flock of an improved breed or grades. Spring lambs and good mutton will always sell. The Southdown and Shropshires have proven so far best adapted to this state.

#### HOG RAISING,

by the adoption of a proper rotation of crops, making the hog gather each crop, can be made exceptionally profitable, provided one can find a ready home market when they are fit for the shambles. At present the coldest spell of winter has to be patiently waited for before the fat porkers can be slaughtered with safety, and during that time they may eat their "heads off," or become victims to disease or disaster. Hence, few persons raise more hogs than are absolutely necessary for home purposes. With packing-houses convenient hog raising would soon become a leading industry of this state and a most profitable one. By planting an acre or two in February or early March of a variety of early ripening sugar cane in rows 3-4 of a foot apart and 6 to 12 inches in drill, it will be ready for the hogs in May. Succeed this with a similar patch of early amber sorghum, which will be ripe in June. Follow with Spanish peanuts, ripe in July, or early cowpeas, ripe at same time. Add to these chufas, a late corn field



with cowpeas and a good lot of sweet potatoes, and you have the material to grow and fatten many hogs. These lots should be arranged so that the hogs could gather them all, and simultaneously have access to a field of grass or clover, with an abundance of fresh, pure water. By adopting such a plan as the above, some of our best farmers have raised hogs for less than a half of a cent per pound. The Berkshire, Jersey Red and Poland China have proven excellent porkers in this climate, while the Essex as a lot hog for the small farmer is unexcelled.

### HOW TO RESTORE OUR WORN SOILS.

The following, taken from a late bulletin of the state experiment station, shows how quickly tired soils may be restored to more than virgin fertility, if proper rotation with fertilization be adopted:

Under this exclusive cotton culture much of the lands of north and middle and east Louisiana have become so depleted of their original fertility as to fail to give remunerative returns for the labor of cultivation. The question of paramount importance to every patriotic citizen of Louisiana is how to restore these worn and tired soils. It is of vital interest to the owners of these lands, to know how to do this, and at the same time receive a fair remuneration for the labor and expense involved in its accomplishment. This the stations have attempted to solve, and a recital here of the results obtained through five years will, it is hoped, convince a few that the plan is a feasible one, and worthy of trial. At Baton Rouge and Calhoun, nearly six years ago, six acres were laid off in acre plats, and the system of rotation of crops, with and without fertilizers, began.

The crops selected were oats, cowpeas, cotton, corn and cowpeas, or five crops in three years. It would be more in accordance with science to follow a crop of cowpeas with corn, but experience has proven that the rust-proof oat (the only variety which can be successfully grown here) must be planted in October to insure a certain crop, and to plant it in this month it must follow a crop of corn, since the cotton crop could not be gathered by this time, hence the order adopted. Three parallel plats of two acres of each are used for the experiment. The front acre of each is fertilized with a fertilizer suitable to the crop occupying it, while the rear acre is left unfertilized. Otherwise the plats are treated alike. The rotation began with oats in plat No. 1 (front acre fertilized and the rear acre not). Plat No. 2 in corn and cowpeas (front acre fertilized, rear acre not). Plat No. 3 (front acre fertilized, rear acre not). The oats were removed in May or early in June, and land sown at once in cowpeas, using for front acre a mixture of 100 pounds acid phosphate and 50 pounds kainite broadcasted and harrowed in with peas. Each crop now goes forward in the circle one step each year. This year we complete the second round of the rotation. At Baton Rouge defective drainage in two of the plats have prevented such decisive results as have been obtained at Calhoun. However,

they are sufficient to establish the value of the rotation. The following are the condensed results at Calhoun:

With oats the yield in 1889 was 71.4 bushels, 82.3 bushels in 1890, 25.5 bushels in 1891, 22.5 bushels in 1892 and 22 bushels in 1893, a total of 85.92 bushels, or an average of 17.18 bushels per year. The yields of corn were 13.09, 20.6, 4.8, 16.6 and 6.4 bushels, a total of 59.49 bushels, or an average of 11.90 bushels per year. The cotton yields were 528, 429, 620, 331 and 560 pounds of seed cotton, a total of 2468 pounds, or an average of 493.6 pounds per year.

The fertilized plats gave for oats 12, 24.5, 55.2, 41.8 and 40 bushels, a total of 179.5. The fertilized corn gave 17.73, 28, 16.8, 34.3 and 24.4 bushels, a total of 121.23 bushels, or an average of 24.25 bushels per year.

The fertilized cotton gave 829, 708, 1719, 1558 and 1440 pounds seed cotton, a total of 6260 pounds, or an average of 1252 pounds per year.

In the five years' trial two seasons have been very dry and yields accordingly depressed. It is, however, worthy of note that the unfertilized plats have suffered the worst by droughts. The aggregate yields of the unfertilized plats have been 85.92 bushels of oats, 59.49 bushels corn, and 2468 pounds seed cotton per acre. The total yields of the fertilized plats have been 179.5 bushels oats, 121.23 bushels corn, and 6260 pounds seed cotton per acre. The excess of fertilized over the unfertilized plats have been 93.58 bushels oats, 61.74 bushels corn, and 3792 pounds seed cotton per acre. The fertilizers used cost \$3 for oats, \$2 70 for corn, and \$3 20 for cotton per acre every year. In this estimate the cotton seed is reckoned at 10 cents per bushel. In five years the fertilizers of the three acres cost \$44 50. Estimating the oats at 30 cents per bushel, corn at 50 cents and seed cotton at 2 1-2 cents per pound, the increase due to the fertilizers would be \$153 84. Deducting cost of fertilizers there would remain \$109 34 as clear profit from the use of fertilizers for five years on three acres, or \$7 29 per acre each year. This is an excellent showing and renders certain this plan of rotation with fertilizers as one which will build up the hill lands of north Louisiana, and at the same time leave a handsome yearly profit for the labor applied. The results from the rotation without fertilizers are not satisfactory, but shows that upon poor lands the process of restoring without fertilizers is slow and gradual. With fertilizers under each crop the process is rapid and profitable. An inspection of the table given will show that the Texas rust proof oats, properly seeded in October, is a more reliable crop in north Louisiana than corn. This will doubtless remain true until these soils become charged with vegetable matter sufficient to enable the corn crop to withstand the droughts which occur at too frequent intervals in the spring and summer.

The following, taken from a pamphlet on Louisiana recently published by the state commissioner of immigration, Colonel J. G. Hawks, gives the names and chief stations of all



## THE RAILROADS IN THE STATE

The Illinois Central System.—This system has two trunk lines extending from the city of New Orleans. The eastern line enters the state of Mississippi near Osyka.

It passes through five parishes of this state, the stations being New Orleans; Sauve and Kenner, Jefferson parish; Frenier and Manchac, St. John's parish, and Ponchatoula, Hammond, Tickfaw, Independence, Amite City, Arcola, Tangipahoa and Kentwood in Tangipahoa parish.

This route penetrates the states of Mississippi, Tennessee, Kentucky, Illinois, Indiana, Ohio, Wisconsin and South Dakota, and touches the borders of Arkansas, Missouri, Nebraska and Minnesota.

The western line of this system, or the Yazoo and Mississippi Valley Railroad, extends along or near the Mississippi river from New Orleans to Memphis, Tenn., having two tap lines in Louisiana and a number of branch roads in Mississippi.

It passes through ten parishes in this state, the following being the most important stations along the line: New Orleans, in Orleans parish; Carrollton and Kenner, Jefferson parish; Sarpys, St. Charles parish; St. Peters and Bonnet Carre, St. John parish; Angelina, and Convent, St. James parish; Burnside, New River and Lane post office, Ascension parish; Iberville and St. Gabriel, Iberville parish; Gardere, Baton Rouge, Baker and Zachary, East Baton Rouge parish; Slaughter, Lindsay, Ethel, Clinton, Wilson and Norwood, East Feliciana parish, and Bayou Sara and Laurel Hill in West Feliciana parish.

The Queen and Crescent System.—The Queen and Crescent System embraces the New Orleans and Northeastern and the Vicksburg, Shreveport and Pacific lines, which extend through the state.

The New Orleans and Northeastern Route passes through two parishes.

The important stations are New Orleans; and Sildell and West Pearl River stations in St. Tammany parish. It enters the state of Mississippi at East Pearl River.

The Vicksburg, Shreveport and Pacific line extends from Vicksburg, Miss., to Shreveport, and passes through eight

parishes, having tap lines from Gibb's station to Homer; from Gibb's station to Bienville, and from Sibley or Minden junction to Minden.

The most important stations are Delta, Tallulah, Barnes, Dallas and Waverly, in Madison parish; Delhi, Rayville and Girard, in Richland parish; Gordon, Monroe, Cheniere and Calhoun, in Ouachita parish; Choudrant, Ruston, Allen Greene and Simsboro, in Lincoln parish; New Arcadia, Gibbs, Talyors and Bienville, in Bienville parish; Homer, in Claiborne parish; Dubberly, Sibley, Doyle and Minden, in Webster parish; Houghton and Dodcaw, in Bossier parish, and Shreveport, in Caddo parish.

The East Louisiana Railroad extends from West Pearl River station, on the New Orleans and Northeastern line of the Queen and Crescent route, to Covington and lies within St. Tammany parish. Its principal stations are West Pearl River, Abita and Covington.

The Louisville and Nashville Route.—This great trunk line penetrates the states of Mississippi, Alabama, Tennessee and Kentucky.

It passes through two parishes and enters the state of Mississippi at the mouth of Pearl river.

The stations along this line are New Orleans, Lee, Gentilly, Chef Menteur, Lake Catherine and Rigolets, in Orleans parish, and Lookout, in St. Tammany parish.

The Texas and Pacific Route.—The Texas and Pacific Railway extends from New Orleans, in a northwestern direction and enters the state of Texas near Washkom station.

It has one branch road in the state, extending from Baton Rouge Junction to the city of Baton Rouge.

There is an independent branch line, connecting with the main line at Cypress station, and connecting Mansfield with the main line at Mansfield Junction.

This route passes through sixteen parishes, and principal stations are New Orleans, Gouldsboro, Gretna and Jefferson, in Jefferson parish; Davis, St. Charles and Dugan, St. Charles parish; St. John and Johnson, St. John parish; Vacherie, Deloquay, St. James and Winchester, St. James parish; Donaldsonville and McCalls, Ascension parish; White Castle, Bayou Goula, Indian Village, Plaquemine and Grosse Tete, Iberville

parish; Baton Rouge Junction, Brusly Landing and Port Allen, West Baton Rouge parish; Maringouin, Fardoche and Ravenwood, Pointe Coupee parish; Melville, Goshen, Rosa and Morrows, St. Landry parish; Bunkie, Avoyelles parish; Cheneyville, Lecompte, Lamourie, Moreland, Alexandria, Rapides, Boyce and Lena, Rapides parish; Chopin, Derry, Cypress, Provencal, Robeline and Marthaville, Natchitoches parish; Sodus, Sabine parish; Oxford, Mansfield, Grand Cane, Gloster and Stonewall, De Soto parish, and Keithville, Reisor, Shreveport, Jewella, Becks and Greenwood, in Caddo parish.

The Southern Pacific Route.—This line extends from New Orleans in a westerly direction, and has the following branches leading from the main line: From Schriever to Thibodaux, from Schriever to Houma, from Baldwin station to Cypremort, from New Iberia to Petit Anse island (or Avery's Salt Mines), from Cade's station to St. Martinville and Breaux's Bridge, and an extensive line from Lafayette to Cheneyville, connecting there with the Texas Pacific Route, and from Crowley to Eunice, in St. Landry parish.

The Southern Pacific passes through thirteen parishes, and the main line enters the state of Texas at Echo station, on the Sabine river.

The most important stations in this state are New Orleans; Gretna, Powell, Murragh and Jefferson, in Jefferson parish; Boutte and des Allemands, St. Charles parish; Raceland, Ewings, Bousseau, Schriever and Thibodaux, Lafourché parish; Houma, Chacahoula and Tigerville, Terrebonne parish; Gibson and Boeuf, Assumption parish; Ramos, Morgan City, Berwick, Patterson, Ricohoc, Bayou Sale, Franklin, Baldwin, Glencoe, Cypremort and Sorrell, St. Mary parish; Jeanerette, Olivier, New Iberia, Petit Anse, Segura and Burkes, Iberia parish; Cades, St. Martinville and Breaux's Bridge, St. Martin parish; Duchamp, Broussard, Lafayette, Scott, and Carencro, Lafayette parish; Duson, Rayne, Crowley, Estherwood and Mermeteau, Acadia parish; Jennings, Evangeline, Welch, Lacassine, Iowa, Chloe, Lake Charles, West Lake, Lock Moore, Sulphur Mine, Edgerly, Vinton, Sabine, Jacksonville and Echo, Calcasieu parish; Grand Coteau, Bellevue, Opelousas, Washington, Beggs, Garland, Whiteville and Barbreck, St. Landry parish; Milburn, Avoyelles parish, and Eola, Haasville and Cheneyville, in Rapides parish.

The Kansas City, Gulf and Watkins Railroad.—This line extends from Alexandria to Watkins, situated on the gulf of Mexico, at the Calcasieu pass.

It has branch roads leading from Bon Air to Lake Charles and Grand Lake.

It passes through three parishes, and its most important stations are Alexandria, Anandale, Vilderouge, Forest Hill and Glenmora, in Rapides parish; Oakdale, Oberlin, Kinder, Fenton, Iowa, Bon Air and Lake Charles, in Calcasieu parish, and Grand Lake and Watkins, in Cameron parish.

The Houston, Central Arkansas and Northern Railroad.—This road extends from Alexandria, in a northeastern direction, and enters the state of Arkansas in the northeastern portion of Morehouse.

It passes through six parishes, and its most important stations are: Alexan-

dria, in Rapides parish; Pollock and Dugdemona, Grant parish; Tullos and Olla, Catahoula parish; Kelly, Grayson, Bridges, Columbia, Riverton and Eureka, Caldwell parish; Boser, Caplin, Monroe and Sicard, Ouachita parish, and Collins, Doss, Mer Rouge, Gallon, Bonita and Jones, in Morehouse parish.

The Texas, Shreveport and Houston Railroad.—This line of railway extends in a southwestern direction from Shreveport and enters the state of Texas at Logansport, on the Sabine river.

It passes through two parishes and the principal stations are Shreveport, Larosen and Keithville, in Caddo parish, and Preston, Keatchie, Longstreet and Logansport, in DeSoto parish.

The St. Louis and Southwestern, or St. Louis, Arkansas and Texas Railroad, extends northward from Shreveport, and enters the state of Arkansas at Rudge station, Bossier parish.

The important stations are Shady Grove, Beaton, Alder, Gernsheim and Rudge, all in Bossier parish.

The New Orleans and Northwestern Railroad.—This line extends from Natchez to Collins' station, on the Houston, Central Arkansas and Northern Railroad, and passes through five parishes.

The most important stations are Vidalia, Concordia, Frogmore and Tensas, in Concordia parish; Greenville, Wildwood, Florence and Pecks, in Catahoula parish; Bryan, Gilbert and Wigginsborough, in Franklin parish; Archibald and Bayville, in Richland parish, and Collins, in Morehouse.

The Natchez, Red River and Texas Narrow-Gauge Railroad extends from Vidalia to Trinity through Concordia parish. Principal stations, Vidalia, Sycamore, and Trinity, in Concordia parish.

The Baton Rouge, Grosse Tete and Opelousas Railroad.—This line extends in a westerly direction from Port Allen to Rosedale. It is twenty-eight miles long and lies within the confines of two parishes.

Its stations are Port Allen, in West Baton Rouge parish, and Rosedale and Musson, in Iberville parish.

The Mississippi, Terres-aux-Boeufs and Lake Railroad.—This line extends down along the eastern coast of the Mississippi river to Bohemia.

It has a branch line from St. Bernard station to Shell Beach, on lake Borgne, and passes through three parishes.

The stations are: New Orleans and Jacksonborough, in Orleans parish; Versailles, Arabi, Poydras, St. Bernard, Toca, Kenilworth, Reggio, Florissant and Shell Beach in St. Bernard parish, and English Turn, St. Clair, Stella, Mary, Greenwood, Mouncella, Sordelet, Nery, Pointe-a-la-Hache and Bohemia, in Plaquemines parish.

The New Orleans, Fort Jackson and Grand Isle Railroad.—This line extends down the western coast of the Mississippi river through two parishes.

The principal stations being Algiers, in Orleans parish, and For Leon, Concession, Belair, Myrtle Grove, Wood Park and Grand Isle.

The City and Lake Railroad extends to Spanish Fort and the Pontchartrain Railroad to West End. These are pleasure resorts on lake Pontchartrain.

The track-laying during the year 1893 in the state was on five lines, and amounted to 2036 miles of road.

# Rivers, Bayous and Lakes of the State

Having spoken several times of our water courses, and the large number of miles of navigable waters in the state, it will probably convey a better idea of the marvelous facility of getting our lumber and soil products to the outside world, by the cheapest transportation known (navigable waters which pene-

trate every parish of the fifty nine in the state, save four), if a detailed description of these water courses is given. The following, taken from the pamphlet recently published by Commissioner Hawkes, will fully explain:  
The navigable rivers, bayous and lakes and the parishes in which they are navigable:

Names of Waters.	Miles of Navigation.	Head of Navigation.	Navigable in the Parishes of
Amite river .....	61.	Port Vincent.....	{ Livingston. Ascension. Avoyelles. Pointe Coupee. St. Landry. Iberville. St. Martin. Iberia. St. Mary. Terrebonne.
Achafalaya river .....	218.	Red river .....	{ Jefferson. Morehouse. Ouachita.
Barataria bayou .....	78.	Harvey's canal .....	{ Webster. Bienville. Bossier. Red River.
Bartholomew bayou .....	40.	Baxter, Ark.....	{ Catahoul. Concordia.
(There is also a bayou Bartholomew in St. Mary's parish.)			{ Bossier.
Bistineau lake .....	30.	Mouth of Dorchite bayou	{ Richland. Caldwell. Franklin. Catahoul.
Black river .....	126.	Mouth of Black river.....	{ St. Mary.
Bodeau lake .....	10.	Bellevue .....	{ Calcasieu. Cameron. Natchitoches. Caddo. St. Landry.
Boeuf river .....	55.	Rayville .....	{ Union. Ouachita.
Boeuf bayou .....	11.	.....	{ Avoyelles. Terrebonne. Webster. Terrebonne. Ascension. Assumption. Lafourche.
(There is also a bayou Boeuf and a river Boeuf in Rapides parish, both unnavigable.)			
Calcasieu river .....	131.	.....	{ Assumption. Lafourche.
Cane river .....	60.	Grand Ecore .....	{ Catahoul. Catahoul.
Cross lake .....	25.	.....	
Courtableau bayou .....	36.	Washington .....	
D'Arbonne bayou .....	50.	Farmerville .....	
De Glaise bayou .....	29.	Evergreen .....	
De Large bayou .....	20.	.....	
Dorchite (or Dauchite) bayou	6.	Minden .....	
Grand Caillou bayou.....	13.	.....	
Lafourche .....	318.	Donaldsonville .....	
(There is a bayou Lafourche also, in the parishes of Morehouse, Ouachita, Richland and Caldwell, not navigable.)			
Little river .....	12.	Catahoul lake .....	Catahoul.
Louis bayou .....	15.	Bayou Castor .....	Catahoul.

Names of Waters.	Miles of Navigation.	Head of Navigation.	Navigable in the Parishes of
Macon bayou .....	138.	Floyd .....	{ East Carroll. West Carroll. Richland. Madison. Franklin.
Manchac bayou .....	18.	Hope Villa .....	{ East Baton Rouge. Iberville. Ascension.
Mermentau river .....	81.	Lake Arthur .....	{ Acadia. Cameron. Calcasieu. Vermillion.
Mississippi river .....	585.	Miles in the state..... .....2,161. Miles to St. Anthony's Falls, Minn.....	{ East Carroll. Madison. Tensas. Concordia. Pointe Coupee. West Feliciana. East Feliciana. East Baton Rouge. West Baton Rouge Iberville. Ascension. St. James. St. John. St. Charles. Orleans. Jefferson. St. Bernard. Plaquemines.
Natalbany river .....	12.	Springfield, La.....	{ Livingston. Tangipahoa.
Ouachita river .....	217.	Camden, Ark.....	{ Morehouse. Union. Ouachita. Caldwell. Catahoula.
Pearl river .....	103.	Carthage, Miss.....	{ Washington. St. Tammany.
Petit Anse bayou .....	8.	Avery's Salt Mine.....	{ Iberia. Caddo. Bossier. De Soto. Red River. Natchitoches. Winn. Grant. Rapides. Catahoula. Concordia. Avozelles. St. Landry.
Red river .....	510.	State Shoals .....	{ De Soto. Sabine. Vernon. Calcasieu. Cameron.
Sabine river .....	387.	Tensas .....	{ St. Martin. Iberia. St. Mary.
Teche bayou .....	91.	St. Martinville .....	{ East Carroll. Madison. Tensas. Concordia. Catahoula.
Tensas river .....	112.	Lake Providence .....	{ Livingston. Tangipahoa. Terrebonne. Tangipahoa.
Tiefaw river .....	16.	.....	{ St. Tammany. Vermillion. Lafayette.
Terrebonne bayou .....	27.	.....	{ Vermillion. Lafayette.
Tangipahoa river .....	15.	.....	{ Vermillion. Lafayette.
Tchefuncta, or Chefunctee.	20.	Old Landing .....	{ Vermillion. Lafayette.
Vermillion river .....	49.	Pin Hook Bridge.....	{ Vermillion. Lafayette.

The navigable waters within the boundaries of the state are estimated to be 3819 miles.

The coast line, bordering on the gulf of Mexico, is 1256 miles long.

## Fish and Oysters of Louisiana.

Apropos of lakes, rivers and streams may be mentioned the varied and abundant fish supply found in them all over the state, affording unending sport to the lovers of the piscatorial art. Every stream and lake has its own peculiar fish, fancied by the dweller on its banks to be unexcelled in gastronomic qualities. Besides, the inland streams, lakes Pontchartrain, Maurepas and others along the gulf coast, furnish an abundance of fish, and are often resorted to by amateur sportsmen from New Orleans. But beyond these, on the gulf coast, lies a mine of wealth but partially developed. The fish and oyster industry, which, if prosecuted to the same extent as is done on the north Atlantic coast, or on the Chesapeake bay, would render Louisiana more famous in this line than she is now for her profusely fertile soils. The red-fish, the pompano, the mullet, the trout, the red snapper and the perch and many other fish of large size and excellent quality are to be found all along the gulf coast from the Pearl to the Sabine river. So, too, with oysters, that delicious bivalve, which here rivals in flavor the far-famed Cherrystone and Horn harbor products of the Chesapeake bay. If the cultivation of oysters was practiced upon our bays inlets and bayous to the same extent and with the same intelligence as is followed upon the Chesapeake bay, New Orleans would soon become a center of oyster packing-houses, and share with Baltimore in the enormous profits now incident to such an industry. The west should be supplied exclusively with gulf oysters, and nowhere can they be more cheaply or profitably grown than along the gulf coast, bordering Louisiana. The following, written by Colonel F. C. Zacharie, in the Southern States Magazine, will give further information upon this much-neglected industry.

### THE LOUISIANA OYSTER BEDS.

The great resources of Louisiana, in its large production of sugar cane, cotton, rice, lumber and fruits, have hitherto kept in comparative obscurity what are generally deemed the minor—and wrongly considered the less remunerative—fields for the employment of capital and intelligent labor. Prominent, if not the principal, among these neglected industries are the vast fishery interests of the state, which, under energetic labor and scientific cultivation, would in a few years equal, if they did not surpass in the way of pecuniary profit, the aggregate value of

the entire state. The extent of the oyster territory is so vast, the supply so abundant and cheap, and so little labor and capital are required for its development, that its wonderful advantages and enormous profits once known, capital and labor will inevitably seek employment in what must eventually become a leading industry, far surpassing that of any state in the union.

On the eastern boundary, starting from the Rigolets, the small gut or strait connecting lakes Borgne and Pontchartrain, the mouths of the Mississippi river to the Texas line, there is a coast of about 600 miles in length, if measured on straight lines from point to point. Making an allowance for the curvatures of the coast, the shores of salt water bays, bayous, inlets, lakes and islands, which fret this part of the state like net work, the littoral line will not fall short of 1500 or 2000 miles. Taking into consideration the shelving, shallow beach adjacent to it, experts well acquainted with its geographical features estimate that the area suitable to planting and growing oysters is double the amount of acreage available in all the other states of the union combined. The coast abounds in suitable places to which the mollusk can be transplanted from the seed bed, and under proper care developed into an oyster which for the delicacy of its flavor cannot be excelled the world over. East of the Mississippi river these natural beds are still numerous and transplanting is carried on to but a limited extent. Not only do these beds supply the wants of the people of the lower coast, but small quantities are shipped to the New Orleans markets, and hundreds of poachers or "pirates," so called, from Mississippi, carry away annually hundreds of schooner loads of the shell fish.

The flavor of these bivalves here taken, although of excellent quality, compared with those of the Atlantic states, yet is by no means equal to those taken from the choice planting grounds across the Mississippi, going west from the great river. Bayou Cook, Grand bayou, bayou Lachute, Grand lake, bayou Lafourche, Timbalier bay East island, Barataria bay, Vine Island lake, Vermillion bay and the Calcasieu grounds furnish the best, those of bayou Cook having par excellence the highest reputation in the markets of Louisiana and the neighboring states, and bringing a correspondingly higher price.

The difficulties, dangers and delays of transportation are being rapidly overcome by railways and canals, some already built and others projected, penetrating the best oyster regions, and if capital be properly encouraged and protected is

its investments, as it assuredly will be, the day is not far distant when the production will be immeasurably increased, the price for home consumption greatly reduced, and an export trade established which will supply the whole of the western territory of the United States, from the Mississippi to the Pacific coast, at reduced prices. Not only to the capitalist is the field open, but to the skilled oyster culturist of Chesapeake and Delaware bays, Long Island sound and the shores of Connecticut, the state offers cheap

oyster lands for sale or to rent, and a free supply of seed. To all such, with a minimum of capital and skilled industry and energy, she opens her arms to welcome them to a home on the verge of her "summer sea," beneath skies which is hardly known what winter is, and to cheer them on to fortune and her own industrial development. This is no fair-seeming false promise, but one tendered in all sincerity, and based on facts which the writer has been careful to understate rather than to overestimate.



The following are a partial list of the more important trees and shrubs of the state:

**Oaks**—*Quercus alba*, white oak; *quercus aquatica*, water oak; *quercus catisbaei*, turkey oak; *quercus cinirea*, sand jack oak; *quercus falcata*, Spanish oak; *quercus lyrata*, overcup oak; *quercus michauxii*, cow oak; *quercus nigra*, black-jack oak; *quercus obtusiloba*, post oak; *quercus palustris*, pin oak; *quercus phellos*, willow oak; *quercus punus*, swamp chestnut oak; *quercus tinetoria*, black chestnut oak; *quercus virens*, live oak.

**Hickories**—*Carya alba*, scaly-bark hickory; *carya amara*, swamp hickory; *carya aquatica*, water hickory; *carya porcina*, pignut hickory; *carya tomentosa*, black hickory; *carya olivaeformis*, pecan.

**Ash**—*Fraxinus Americana*, white ash; *fraxinus platycarpa*, water ash; *fraxinus veredis*, green ash.

**Elms**—*Ulmus alata*, wahoo or winged elm; *ulmus fulva*, slippery elm; *ulmus Americana*, white elm.

**Gums**—*Nyssa sylvatica*, black gum; *nyssa uniflora*, tupelo gum; *liquidambar styraciflua*, sweet gum.

**Magnolia**—*Glauca*, sweet bay; *grandiflora*, magnolia macrophylla, cucumber tree.

**Pines**—*Mites*, short-leaf pine; *palustus*, long-leaf pine; *taeda*, loblolly, or old field pine.

**Maples**—*Aceri* *bactatum*, hard maple; *aceri rubicuum*, red maple; *aceri saccharinum*, sugar maple.

**Prunus**—*Americana*, American plum; *angustifolia*, Chickasaw plum; *serolina*, wild cherry.

**Buckeye**—*Aesculus indet*, buckeye; *aesculus pavia*, red buckeye.

**Marshmallow**—*Hibiscus incanus*, marshmallow; *hibiscus moschentos*, marshmallow.

**Sumach**—*Rhus glabra*, sumach; *rhus copallina*, sumach.

**Haw**—*Vibunum*, medium haw; *vibunum*, pinnifolium, black haw; *vibunum scabrelum*, haw.

**Other trees**—*Ostuja Virginica*, Ironwood; *cornus floida*, dogwood; *sassafras officinale*, sassafras; *diospyras Virginiana*, persimmon; *asimilara parviflora*, Pawpaw; *gleditschia triacanthos*, honey locust; *gleditschia monosperma*, water locust; *hamamelis Virginica*, witch hazel; *oxydendrum arboreum*, sour wood; *myrica cerifera*, wax myrtle; *alnus serrulata*, alder; *castanea pumila*, chinquepin; *juniperus Virginiana*, red cedar; *fagus ferruginea*, beech; *tilla Americana*, linden tree; *carpinus Americana*, hornbeam; *flex opaca*, holly; *enonymus Americanus*, burning bush; *lenodendron tulipifera*, tulip, or poplar; *crataegus apifolia*, hawthorn; *sambucus Canadensis*, alder; *chronanthus Virginica*, fringe tree; *morus rubia*, mulberry; *maclura aurantiaca*, Osage orange; *betula rubra*, red birch; *populus heterophylla*, cottonwood; *salix* —, willow (many species); *atalpa bignoides*, catalpa; *platarius occidentales*, sycamore; *negundo aceroides*, box alder; *celtis occidentales*, hackberry; *taxodium distichum*, cypress; *juglans nigra*, black walnut; *xanthoxylum clava*, prickly ash.

When the areas devoted to the above trees are known, some idea of the quantity of timber existing in Louisiana will be formed. Of the entire forest wealth of the United States over 60 per cent is situated in the south, and of this amount Louisiana possesses the lion's share. In fact, it may be said that 75 per cent of this wonderful forest wealth is lying along the tributaries of the Mississippi river or gulf of Mexico, and is readily accessible to the wharves of New Orleans and Baton Rouge. Millions of dollars have been recently invested in these timber resources, and the saw mills and planing machines of the north, like the cotton factories, are gradually moving south for large profits. The greatest timber wealth of this state is in its immense areas of long and short-leaf pine and its unparalleled forests of cypress. While other southern states share with us the claims for superiority, in both quality and quantity of the former, of the latter we stand without a rival, in both the immense quantity avail-

able and the excellent quality of the lumber made therefrom. Only a few years ago and our cypress lumber was but little known and appreciated; to-day it ranks with other varieties of timber in quantity and surpasses all other in quality. The Cypress Lumber Manufacturing Association, which meets monthly in New Orleans, represents an output of over 300,000,000 feet of finished lumber per year.

The adaptability of the cypress to the many uses in building—doors, blinds, windows, floors, inside finish, outside work, bevels and drop siding, etc., and its wonderful powers of duration, even when exposed to the vicissitudes of sunshine and rain, heat and cold, dry and wet climates, have made it a favorite wherever known since the times of the Pharaoh of Egypt. So highly has it been appreciated of late, that its current market prices have scarcely depreciated at all during the recent trying financial depression. It will receive paint easily or can be hard-finished with the most beautiful effect.

**Other Woods.**—Next to cypress stands in importance, both as regards the quantity and excellent quality, our long-leaf pine. This tree furnishes also a large industry in each of the states of Alabama, Georgia, Florida, Mississippi, Arkansas and Texas, and is well known all over the Americas, if not over the civilized globe. The area covered by the long-leaf pine in this state is enormous and may be approximately estimated by the total area given for the long-leaf pine hills and flats given in the agricultural part of this pamphlet, for very little comparatively of the original growth has yet been removed.

The short-leaf pine forests abound in the region of oak uplands, and furnish a large number of square miles of available timber.

Ash, oaks, magnolia, beech, walnut, gums, cottonwood, maples, etc., are found in large quantities upon the bluff lands and inland streams of the state, and nowhere on earth is there presented finer opportunities for all manufactures of wood than here in Louisiana. Factories for wagons and carriages, hollowware, barrels, staves, hoops, ax and hoe handles, etc., could all be carried on here successfully with the materials gathered cheaply from our forests. Our cottonwood and tulip (poplar) trees could be converted into boxes and paper, right on the banks of our streams, with cheap, deep water transportation to almost everywhere. Next to the wealth of our existing soils, comes the wealth already drawn from these soils in the shape of forest growth.

The forestry bulletins of the last census of the United States give the following estimates of long and short-leaf pine standing June 1, 1880, viz:

	Long Leaf. Feet.	Short Leaf. Feet.
Alabama ..	18,885,000,000	.....
Florida ....	6,615,000,000	.....
Arkansas ..	.....	41,315,000,000
Georgia ...	16,778,000,000	.....
Louisiana ..	26,588,000,000	21,625,000,000
Mississippi	17,200,000,000	6,775,000,000
N. Carolina.	5,229,000,000	.....
S. Carolina.	5,316,000,000	26,093,200,000
Texas .....	20,508,000,000	26,093,200,000
<b>Total.</b> ..	<b>117,119,000,000</b>	<b>121,901,400,000</b>

## EDUCATION

in this state is largely done by private schools and colleges, though the state supports liberally public schools in every parish, a state normal school, well-administered and attended, at Natchitoches; a state industrial school at Ruston, recently organized, and the Louisiana State University, Agricultural and Mechanical College at Baton Rouge, La. The last is an institution of high grade, well officered and attended by over 200 young men from all parts of the state.

Connected with the latter are three agricultural experimental stations: No. 1, the sugar experiment station, located at Audubon park, New Orleans; No. 2, state experiment station, at Baton Rouge, and No. 3, north Louisiana experiment station at Calhoun, in the hills of the state. These stations are well equipped and are doing extensive work along the lines of agricultural re-

search. Over a thousand different varieties of plants are under cultivation, and one of the leading objects of these stations is the introduction and trial of new crops. Bulletins are issued regularly, giving the results of the numerous experiments in the field, laboratories and sugar-house. The Audubon Sugar School, located at Audubon park, New Orleans, in connection with the sugar experiment station, gives thorough instruction in the agriculture, mechanics and chemistry of sugar growing and manufacture.

Besides the above public system of instruction, from the public school to the State University and Agricultural and Mechanical College, each city, town or village has its graded schools, reaching through an academic course. To these must be added the private and denominational schools and colleges. The Methodists have a college for young men at



Jackson. The Catholics have male colleges in St. James and St. Landry parishes. Female colleges or convents exist in St. James, Baton Rouge, Alexandria, Shreveport, Opelousas and Monroe. There are several Catholic colleges for both boys and girls in New Orleans.

Clinton has a flourishing female college (the Silliman Institute) and a fine military academy. Shreveport has also a flourishing female college and military academy, besides an excellent system of graded public schools.

Arcadia, Ruston, Minden and Homer have excellent private colleges.

The Methodists maintain an excellent female college at Mansfield, and the Baptist at Keatchie and the Masons at Fort Jessup.

Monroe, Lake Charles, Iberia, and other towns maintain excellent graded schools

Tulane University, situated in New Orleans, established by the munificence of Paul Tulane, has recently fitted out in handsome style all of its colleges. Its colleges of arts and science, letters, engineering, law and medicine are numerous and enjoy high rank. Its female department, the Sophie Newcomb College, stands in the front rank of female colleges, and its graduates are noted for their thorough scholarship. The above are for the education of the whites. The negroes have been provided for with separate public schools and an institution of high grade, the Southern University, located in New Orleans, all supported by the state. There are also about a half-dozen colleges or universities supported by private or missionary contributions, which are well managed and attended.



The erroneous impression prevails throughout the country that Louisiana is a low-lying swamp, full of deadly malaria, the implacable mosquito and the slothful alligator, uninhabited and uninhabitable save by the negroes. This impression is further accentuated by publications emanating from public officers, who are credited by the public with a full knowledge of the facts which they record, when really they know no more about Louisiana than a 12-year-old pupil in the public schools of the country. In the compendium, of the eleventh census, 1890, part 1, population, Robert B. Porter, superintendent, page 58, a description of the alluvial region of the Mississippi is given. At the close of the section, the following language is used: "The soil is of the highest degree of fertility, but the climate is hostile to the white race, and by far the larger proportion of the inhabitants is of the colored race." This fact!!! is announced in several other places in the same volume.

What would the numerous planters who reside in this valley respond to such an unjust aspersion upon their homes? New Orleans, situated in this region, with its 300,000 inhabitants, three-fourths of whom are white, and of the white, 75 per cent are permanent dwellers there winter and summer, would refute such a slander, if the writer would visit and see the number of rosy-faced children, robust men and pretty women filling her streets and her homes. Of course, when men high in official circles will promulgate as an official fact, collected like other census data, by reliable agents, at government expense, such untrue aspersions upon a large section of the country, lay

readers must accept them as truths beyond cavil. But the writer, with a large corps of assistants gathered from a dozen states and countries, himself coming from a high country free from malaria, has been a dweller upon the banks of the Mississippi river for nine years, and can state that in that time all have enjoyed excellent health, without a serious illness; nor have a single one been forced to leave this fertile country because "the climate was hostile to the white race." In fact, with proper care and diet, nowhere can a white person live with greater immunity from diseases of all kinds than on the banks of the Mississippi river in this state.

But facts are worth more than opinions and here are some taken from a recent address by the president of the board of health of this state:

The average mortality for the whole United States is 14.70 per 1000 for the whites and 17.29 for the blacks.

For the white, Oregon is first, with a mortality of 11.04 per 1000, with Minnesota, an excellent second at 11.51 and Arkansas brings up the foot of the list with a mortality of 19.11, very closely pushed by educated and scientific Massachusetts with a mortality of 18.56.

For the blacks, the negro enjoys the greatest exemption in Florida, having a rate of mortality in that state of 11.36 per 1000. He has a very hard time in Rhode Island, where his mortality is 27.10, and he is very much worse, and the very worst off, under the very eye of his particular guardian, the general government, for his mortality in the district of Columbia is 35.62 per 1000.

Now as to the position which Louisiana occupies in the white list. I am very

sure that Vermont, Tennessee, Indiana and Texas have each of them enviable reputations for healthfulness, and a favorable comparison of Louisiana with any of the four would undoubtedly excite derision.

What are the facts? Vermont has a white mortality of 15.13 per 1000; Tennessee, 15.21; Louisiana, 15.45, Indiana, 15.88, and Texas, 15.86; or, in this group of known healthy states, Louisiana stands superior to two and presents only a very small fractional inferiority to the others.

The highest on record of percentage of deaths from malarial fever stands Florida, with .53 per cent of its total mortality from this disease; the lowest Rhode Island, with only .08 per cent. In between these two extremes come the other states, those adjacent to our great streams showing a higher rate than the others. Arkansas has 7.65 per cent, Alabama 7.35, Mississippi 7.06, Louisiana 6.06, and Texas 6.04. Our own state showing more favorably than any of her neighbors, save one, in a mortality springing from a disease largely preventable by ordinary attention, by the mass of the people, to the plainest and simplest laws of hygiene.

The least infant mortality is exhibited in New Hampshire, which has 20.88 per cent of infant to the total mortality; Maine, 23.57; Vermont, 24.10; California, 25.31; New York, 25.39; Connecticut, 26.75; Massachusetts, 20.21; Ohio, 33.36; Rhode Island, 33.69; Oregon, 34.99; New Jersey, 35.52; Wisconsin, 35.61; Pennsylvania, 36.15; and then Louisiana, with 38.05, the list ending with Kansas and Nebraska, the highest rates in the union—Kansas with 47.56 and Nebraska with 49.12 per cent.

In this list Louisiana is not preceded by any southern state. And should the calculation be based on the white population only or on an equal percent of colored to white which exists in each

of the northern states ahead of her, her rank would not be fifteenth, but third or fourth. The infant mortality among negroes is enormously large, as from their habits it must be. Substitute a comparison between the whites in the rural sections of the union, north and south, and many of our southern states would show that our people cared well for their young.

The mortality from consumption, that dreaded universal and almost hopelessly fatal disease, can in the country, where the close confinement of people engaged in sedentary occupations, in ill-ventilated, crowded apartments does not exist, may be taken as a fair criterion of the actual influence of climatic conditions on the inhabitants. Arkansas enjoys great exemption from this disease with percentage to its total mortality of 6.42; Texas second, with 6.05 per cent; Nebraska third, with 6.93; Kansas fourth, with 7.54; Louisiana fifth, with 7.41; Florida sixth, with 8.14; Oregon twentieth, with 12.12 per cent; California thirty-third, with 15.80, and Maine the very last, with 19.16 per cent.

From the foregoing facts we may conclude with certainty:

First—That Louisiana enjoys relatively to her neighbors a favorable position in regard to mortality from malarial fevers, being superior to Arkansas, Alabama, Mississippi and Florida, and only a small fraction inferior to Texas.

Second—That her percentage of deaths of children places her above any of the southern states, and, if like population be compared with like, her position will be third or fourth among all the United States.

Third—That her position in reference to lowest rate of deaths from consumption, a disease very dependent upon climatic conditions, is fifth.

Fourth—That her percentage of deaths of old people places her second among the states for possibilities of long life.

## Cities and Towns of Louisiana.

The city of New Orleans, the great commercial metropolis of the southwest, situated upon both banks of the Mississippi river, is too large and important for a full description here. Hand-books of the city have been compiled by the Young Men's Business League of New Orleans, and Captain J. F. Merry, assistant general passenger agent of the Illinois Central Railroad, Manchester, Iowa.

Copies can be obtained by addressing as above.

This city lies near the mouth of the Mississippi river, and should be the gateway of exports and imports for the entire Mississippi valley, which contains a population, according to last census, of over 27,000,000 of people. It has an aggregate of over 30 miles of river front, along the wharves of which the largest

ocean steamer can load. She receives over 2,000,000 bales of cotton, 600,000,000 pounds of sugar, 1,000,000 sacks of rice, 300,000 barrels of molasses, many millions of bushels of wheat, corn and oats; 150,000,000 feet of lumber, with immense quantities of shingles, laths, brick and lime. It has six of the largest railroads centering here, reaching out to every part of the country, besides several local lines. It has an immense river trade by steamers and barges, and with an ocean trade averaging four ships per day leaving her port loaded. It is the second largest exporting city in the union, and should occupy the same position as an importing city. It has sixteen commercial banks, with \$9,000,000 capital, handling \$220,000,000 exchange annually. It has twelve insurance companies, doing a business of \$30,000,000 annually. It has numerous building and loan associations. It has a commerce of 8,500,000 tons. It is the largest importer of tropical fruit. It is the center of the extensive lumber interest of the south. It has over 2500 manufacturing plants, with \$50,000,000 invested, paying out annually \$15,000,000 in wages and producing \$70,000,000 of finished products. It has a population of about 300,000 people. It has over 150 miles of electric railways. Largest freight ships in the world can enter the river. It has a fine system of graded public schools. Is the seat of the Tulane University and H. Sophie Newcomb College for girls. It is one of the best locations in the world for manufactories of all kinds. It will soon have a railroad bridge over the Mississippi river. It already has five large grain elevators. The total value of its commerce is nearly \$600,000,000. Its exports are \$120,000,000. Its imports are \$31,000,000. It will soon have a United States navy yard. It already has several private dry docks. It has a large number of handsome churches, excellent public buildings and superb commercial exchanges. When the Nicaragua canal is completed its trade will quickly double. Its climate is salubrious; people refined and hospitable. Further information can be furnished by the Young Men's Business League, Captain Harry Allen, secretary, New Orleans, La.

Shreveport, situated on Red river, is the second city in size of the state, claiming 18,000 inhabitants. It has a tributary coast line of 1000 miles, besides splendid railroad facilities. It has five completed roads, three incomplete and four projected lines. When all are completed it will be the great railroad center of the northwestern portion of the state. By river it is 600 miles to New Orleans; by rail, 328 miles. It is fully equipped as a city, with handsome public buildings,

electric street railways, electric lights, fire alarm, water works, city telephone, etc. It has four banks with a capital of \$700,000, and one insurance company. It receives about 100,000 bales cotton and enormous quantities of hides and wool. It has extensive cotton seed oil mills, fertilizer factories, ice works and other minor industries. It has fine churches, excellent graded schools and a most excellent male academy and female college. The people are noted for their liberal hospitality and business push. Factories of all kinds are desired, and public and private aid will be given to those locating there. The Development Club, with Mr. L. M. Carter president, and V. Grosjean, secretary, will give further information.

Baton Rouge, situated on the first bluffs of the Mississippi river, is the third city in size in the state. It is the capital of the state, and here, besides the handsome state capital building, are located the state penitentiary, the Deaf and Dumb Asylum and the State School for the Blind. The insane asylum is located at Jackson. This city boasts of 13,000 inhabitants. It is one of the finest located cities in the world; on a bluff 60 to 70 feet high overlooking the river, and with a natural drainage basin. It has three railroads completed and several projected. It has three banks and one local insurance company, all doing a profitable business. It has two large brickyards, two immense lumber mills, one hoop factory, one barrel factory, one large central sugar factory and two ice plants, besides two cotton seed oil mills and one fertilizer factory. It is one of the best locations for manufactures in the state. Being on the Mississippi river, it enjoys the benefits of low freights both for the raw material and the manufactured products. It is situated in one of the richest sections of the state, and does a thriving mercantile trade. The State University and Agricultural and Mechanical College is located here, and is largely attended. The State Experiment Station is also located here, and its investigations are published in bulletins which are distributed free to any applicant. The health is excellent. The people refined and cultivated. It is surrounded by a country splendidly adapted to truck growing, market gardening and stock raising. Further information will be furnished by the Young Men's Business League, H. A. Morgan president, Baton Rouge.

Alexandria, Monroe, Lake Charles, Iberia, Opelousas, Natchitoches, Donadsonville, Plaquemine, Lafayette, Franklin and Thibodaux are all towns of over 2000 inhabitants and have aspirations for fuller development and larger importance. Each have one to three banks, several manufactories and are centers of trade.

# HOMES FOR ALL IN LOUISIANA.

There are lands enough in this state to meet all demands for several years. The prices are low, far below their intrinsic value.

To those seeking a home in our midst, the following information is given. The lands to be obtained in this state are of five classes, viz:

First—United States government lands, of which there are yet about 2,000,000 acres left in the state, subject to homesteads. Full information can be obtained by addressing the United States land office at New Orleans for south Louisiana, or same at Natchitoches for north Louisiana.

Second—State lands, of which there are 3,423,199 acres. Full information in regard to these can be given by Major Jno. S. Lanier, register of state land office, Baton Rouge, La.

Third—Railroad lands. There are large bodies of these lands in the state.

The Vicksburg, Shreveport and Pacific Railroad owns 400,000 acres in the parishes of De Soto, Caddo, Bossier, Webster, Claiborne, Bienville, Jackson, Lincoln, Union, Ouachita, Morehouse, West Carroll, Richland and Madison. Mr. Jno. M. Lee, Jr., Monroe, La., is general land agent and will give full information in regard to these lands.

Fourth—Land companies, of which many exist in this state. The following can give information:

The Watkins Land Company, Lake Charles, La.

The English Syndicate, Dr. S. A. Knapp, president, Lake Charles.

The Louisiana Land and Development Company, D. L. McPherson, secretary, Abbeville, La.

Messrs. Duson Bros., Crowley, La.

Mr. S. L. Carey, Jennings, La.

Mr. F. M. Welch, Alexandria, La.

The Development Club, Shreveport, La.

The Young Men's Business League, Baton Rouge, La.

The Young Men's Business League, New Orleans, La.

Howcote Land Company, New Orleans.

Curtis & Walmsley, New Orleans.

J. W. Coleman & Co., New Orleans.

Northwestern Land Company, J. H. Hilliard, secretary, Shreveport, La.

Fifth—Private lands in each parish, which can be bought only through the owner.

The following railroad agents can also furnish information relative to prices of lands and descriptive matter of the country through which their respective roads pass:

Captain J. F. Merry, assistant passenger agent Illinois Central Railroad, Manchester, Iowa.

Mr. E. Hawley, assistant general traffic agent Southern Pacific Company, 343 Broadway, New York.

Mr. Frank G. Anderson, land commissioner V. S. and P. Railroad, Birmingham, Ala.

## STATEMENT OF NORMAL WEATHER CONDITIONS AT NEW ORLEANS, LA., DURING EACH MONTH OF THE YEAR.

Compiled from Weather Bureau records extending back to Nov. 1, 1870, except the rainfall, which includes non-official (but reliable) records that extend back to 1840.

Nature of Data.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Mean temperature .....	54.0	58.7	62.3	69.0	74.8	80.6	82.6	81.8	78.2	70.1	61.2	55.9
Mean maximum temperature .....	61.5	66.0	69.9	76.2	82.0	87.1	89.0	88.1	84.4	76.8	68.5	63.2
Mean minimum temperature .....	46.6	51.4	54.7	61.7	67.6	74.0	76.1	75.4	72.0	63.4	54.0	48.6
Highest daily record .....	82.0	84.0	84.0	88.0	92.0	97.0	99.0	96.0	94.0	85.0	80.0	80.0
Lowest daily record .....	15.0	25.0	30.0	38.0	53.0	58.0	67.0	63.0	56.0	40.0	30.0	20.0
Average rainfall .....	5.44	4.68	5.46	4.96	4.95	6.49	6.88	6.29	5.05	3.21	4.29	4.63
Days clear .....	9	10	11	11	12	12	9	8	12	16	12	9
Days partly cloudy .....	12	10	11	12	14	15	17	17	12	10	9	11
Days cloudy .....	10	9	9	6	5	6	5	6	6	5	9	11
Days with rain .....	11	10	10	6	9	14	16	14	11	7	9	11
Prevailing wind .....	N.	N.	S. E.	S. E.	S. E.	S. E.	S. E.	S. E.	E.	N.	N.	N.

The lowest temperatures recorded each year for twenty years at New Orleans are: 1875, Jan. 10, 28 degrees; 1876, Dec. 30, 28 degrees; 1877, Jan. 29, 26 degrees; 1878, Dec. 28, 27 degrees; 1879, Jan. 6, 20 degrees; 1880, Dec. 30, 20 degrees; 1881, Jan. 1, 31 degrees; 1882, Dec. 8, 30 degrees; 1883, Jan. 22, 34 degrees; 1884, Jan. 6, 22 degrees; 1885, Jan. 2 and 18, 28 degrees; 1886, Jan. 9, 15 degrees; 1887, Jan. 3, 21 degrees; 1888, Jan. 19, 29 degrees; 1889, Feb. 7, 32 degrees; 1890, Dec. 9, 35 degrees; 1891, Nov. 30, 30 degrees; 1892, Dec. 27, 23 degrees; 1893, Jan. 20, 29 degrees; 1894, Dec. 29, 21 degrees.

## LETTER OF STATE REGISTRAR.

STATE OF LOUISIANA,  
State Land Office,

Baton Rouge, Nov. 23, 1893.

Commissioner of Immigration, New Orleans, La.: Dear Sir—Replying to your letter of the 21st inst., I have to inform you that the within copy of act is still in force, and is the law. This does not apply at all to homesteaders, that the governing law as to these is act. No. 61, of the session of 1883, which you will find on page 70 of the acts of that year.

Homesteaders are not required to pay any fees or price whatever, except when they require copies of survey and certificates, which they seldom do.

The inclosed copy of act 85 of 1880 refers entirely to purchasers of state lands. The public lands donated by the acts of congress to the state are all swampy and overflowed, and were so donated because they were not fit for settlement and cultivation; hence there are few homestead entries made at this office.

The United States owns large areas of land in this state which is reserved for actual settlers or homesteaders; of these and all laws bearing on the subject you can obtain from the registrar United States land office in your city.

Very respectfully,

JOHN S. LANIER, Registrar.

## PUBLIC SCHOOLS.

State Constitution, Art. 208. The general assembly shall levy an annual poll tax for the maintenance of public schools, upon every male inhabitant in the state over twenty-one years, which shall never be less than one dollar and a half per capita, and the general assembly shall pass laws to enforce payment of said tax.

Art. 224. There shall be free public schools established by the general assembly throughout the state for the education of all the children of the state between the ages of six and eighteen years; and the general assembly shall provide for their establishment, maintenance and support by taxation, or otherwise, and all moneys so raised except in proportion to the number of children between the ages of six and eighteen years.

Art. 227. The funds derived from the collection of the poll tax shall be applied to the maintenance of public schools as organized under this constitution, and shall be applied exclusively to the support of public schools in the parish in which the same shall have been collected, and shall be accounted for and paid by the collecting officers to the competent school authorities of each parish.

Art. 229. The school funds of the state shall consist of: 1. The proceeds of taxation for school purposes, as provided in the constitution. 2. The interest on the proceeds of all public lands heretofore granted by the United States for the use and support of public schools. 3. Of lands and other property which may hereafter be bequeathed, granted or donated to the state or generally for school purposes. 4. All funds or property other than unimproved lands, bequeathed or granted to the state, not designated for other purposes. 5. The proceeds of vacant estates falling under the law to the state of Louisiana.

The legislature may appropriate to the same fund the proceeds, in whole or in part, of the public lands not designated for any other purpose, and shall provide that every parish may levy a special tax for the public schools therein, which shall not exceed the state tax; provided, that

with such tax the whole amount shall not exceed the limits of parish taxation fixed by this constitution.

Article 230 provides that the Louisiana State University and Agricultural and Mechanical College, located in the city of Baton Rouge, shall be maintained, and all the revenues derived from the sale of land donated by the United States to the state, shall be used for the support of the same.

"Property dedicated to the use and belonging to the public schools, or employed by municipal corporations for that purpose, shall be and is hereby exempted from seizure."

### "GENERAL OBSERVATIONS."

"The public school system is rapidly growing in popular favor in this state; and it may be truthfully said that there are but few communities to be found so callous and benighted as not to fully appreciate the importance of educating their children, and fitting them for the duties and responsibilities of life.

"In our cities and throughout the rural districts, very many of our best and ablest men and women are giving their aid and influence to the advancement of the cause, and the great masses of the people are beginning to realize the pressure of a new and higher civilization. Elements of success are combining in this state that must assuredly triumph over all obstacles and disadvantages, and soon place the public school system of Louisiana in the front rank of the forty-four state systems now prevailing in this country.

"It is not pretended that our system is perfect, or that its success is commensurate with our desires, but we do mean that there has been a steady advance, an orderly progress, and that however inadequate our school revenues may still be, they exceeded a million last year, and that we have abundant reason to feel gratified and encouraged with the general outlook. We feel satisfied that the table and diagrams appearing in this report will bear us out in what we say."



## The Newspapers of Louisiana.

**N**O presentation of the advantages offered by Louisiana to immigration would be satisfactory or complete without some allusion to the press of the State.

This great agent and engine of popular education and enlightenment is represented by 172 serial publications, of which, 14 are issued daily; 2 semi-weekly; 147 weekly; 3 semi-monthly, and 6 monthly. Of these, 7 are printed in both French and English; 3 in French wholly; 3 in German; 2 in Italian, and 1 in Spanish. They are for the most part well-conducted and are excellent exponents of the local interests of the several parishes and districts in which they are printed. The intending settler can thus learn all that he desires short of a visit to the locality which he proposes to examine, and therefore they should be carefully consulted by persons at a distance. The States press is made up of secular, religious, trade, professional and literary publications representing all classes and every important interest.

The leading newspaper published in Louisiana is the New Orleans *PICAYUNE*. It was started in January, 1837, and has attained its 58th year. It is the oldest English paper in the city or in the State, its age being surpassed only by that of *L'Abeille* (the Bee), which is ten years older and is printed in the French language, and with the two exceptions of the Bee and the *Deutsche Zeitung* or German Gazette, it is the only paper in New Orleans that has survived the civil war.

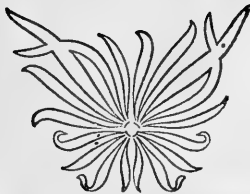
The *PICAYUNE* has always been an able, conservative, enlightened representative of the best interests of Louisiana and of the great southwest in whose progress and development it has had a large share, and no paper in this country has been so close to the people themselves. It is their great tribune and advocate, ever standing against political trickery and official dishonesty, and being free from all corrupt jobs and selfish schemes it has always maintained the highest place in public confidence and favor.

The *PICAYUNE* was started by the brilliant and famous George Wilkins Kendall, one of the most distinguished wits of his day, and, perhaps, the first journalist in the world who played the part of a correspondent for the press from military headquarters in the field, Mr. Kendall having accompanied the United States army of invasion to Mexico during the war of 1846-47,

sending to the PICAYUNE the first and freshest news of all the military operations of that important war.

Since then, the PICAYUNE has been conducted by many able and often distinguished men, constantly improving its excellent qualities as a newspaper, and always growing in influence and ability to represent and work for the people of New Orleans, of Louisiana, and of the South, until under its present proprietors, Mrs. E. J. Nicholson and Col. George Nicholson, it has reached the summit of journalism and is the leading paper in the great Southwest.

A volume could be filled with accounts of the PICAYUNE's enterprise in getting news, from the time of the Mexican war down to the present, but what has been said will suffice. Its complete offices of publication containing the most improved machinery and perfect appliances which science has provided for the production of newspapers and its able and skilled corps of thinkers and workers, combine to make it what it is, one of the great American dailies and the chief of all the journals of the Southwest.



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# WHY YOU SHOULD SETTLE IN LOUISIANA



## BECAUSE

- It is the best country known to the man of moderate means.
- Because you will find a country of rich soil awaiting the settler.
- Because there are uplands, prairie lands and alluvial river bottoms.
- Because you can be certain of profitable returns from whatever you put into the soil.
- Because the winter does not consume what the summer produces.
- Because there are more and better opportunities for diversified farming than elsewhere.
- Because the seasons are regular and no fear of crop failure.
- Because the country is never scourged by cyclones and devastating storms or blizzards.
- Because everything grown elsewhere can be produced here more abundantly.
- Because truck farming is a success; products being early on the market obtain high prices.
- Because no better fruit country is known, oranges, plums, pears, peaches, apples, grapes, strawberries, figs, pecans and others fully maturing.
- Because there are more chances for profitable investment of capital than elsewhere in this country.
- Because for healthfulness this section is unequalled on the face of the globe.
- Because you have no long winter months to encounter, with no excessive dry heat in summer.
- Because the climate is more uniform than elsewhere, no extremes of heat and cold.
- Because you will find as orderly communities as anywhere on this continent.
- Because you will find the most open-hearted people on the globe.
- Because education is paramount; public schools and churches of every denomination are to be found in all communities.













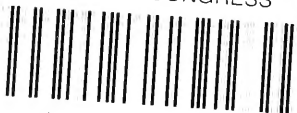








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