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STATE
IMMIGRATION ASSOCIATION,
OF LOUISIANA.

No. 620 Common St., NEW ORLEANS, LA.

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A HAND-BOOK

... of...

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... giving...

GEOGRAPHICAL AND AGRICULTURAL FEATURES

... together with...

Crops that Can be Grown,

Description of each Parish, Climate, Health,

Education, Fish and Oysters, Railroads, and Watercourses.

COMPILED AND WRITTEN BY REQUEST

... for...

The State Immigration Association,

... by...

WM. C. STUBBS, Ph. D.,

... DIRECTOR...

STATE EXPERIMENTAL STATIONS.

NEW ORLEANS:
PRINTED BY NEW ORLEANS PICAYUNE.
1885.
IF 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,
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620 Common Street,
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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.
"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 Salcedo, 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."
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 16,000,000 is 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 and dykes. 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 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 2,000,000 are cultivated. Upon these acres there were grown last year products valued at some $75,000,000, distributed as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>$35,000,000</td>
</tr>
<tr>
<td>Cotton</td>
<td>21,000,000</td>
</tr>
<tr>
<td>Rice</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Corns and hay</td>
<td>30,000,000</td>
</tr>
<tr>
<td>Oranges</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Live stock and other products</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

From these figures very interesting and instructive deductions might be drawn of the proper 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 Texas and Louisiana, in 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 mode of living has been perfected, much of our alluvial lands, by proper drainage, can be reclaimed, adding to our present cultivable acres 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 scientific 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 30 minutes and 33 degrees 30 minutes latitude, and the extremes of 80 degrees and 94 degrees west longitude. The Mississippi river splits it in two, with 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 30,000 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 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 protracted, 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, the highest temperature has been the record temperature at New Orleans, 92 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 55 degrees in the southern, and about 45 degrees in the northern part of the state. Occasionally the region is liable to a northeaster 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 favor the culture of a few crops (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 13 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 in the extreme northern portion. The heaviest showers fall in summer during the growing season. Winter comes next in its quantity of rainfall, while springs and autumns are our dry seasons, with only occasional showers. Such seasons are conducive to the welfare of our staple crops, cotton, tobacco and rice, permitting a successful planting and cultivation of these crops and dry autumns.
so essential to the rapid and economical barge trade of the state. Our river channels are from the southwest, yet in smaller they sometimes come from the northwest, and when they do, they are usually accompanied by occasional ice jams.

The climate of the entire state, from October to May, is an ideal one, attractive alike to the invalid and tourist, and the long, hot summers are largely ameliorated by the ocean breeze from the Gulf.

The geologist of today is practically in a state of awe and astonishment at the prospect of the geological formations, which are so suggestive as to the underlying and ancient. No other region in the world has so many geologists working on the same material. The geologists of the state are constantly discovering new regions, and the number of geological surveys is constantly increasing.
of the gypsum bed, it is probable that the depth to which the local shall bed was correspondingly great, and that, however it may have been encroached upon by solution and erosion during the terminal and postglacial periods, it will still be found of sufficient thickness and accessibility for exploitation at numerous points outside of Petite Anse. This very local and variable extent is, however, in a much more restricted sense, of the Calciferous sulfuphur bed. The obvious fact that the drift currents have cut the surface, and only upon both deposits, renders the determination of their occurrence in particular localities a matter of considerable difficulty.

It is, therefore, highly probable that similar deposits of salt, gypsum and sulfur 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 river, causing the formation of fractures and folds, and gave to Louisiana an outline of its future drainage channels. This ridge, running 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 "upper lignitic," since lignite and lignitic clays abound. In DeSoto and Sabine parishes beds of lignite occur in many places in the country underlied by this formation covers nearly the entire northern-western 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. This section is to be considered as being but the beginning of a large deposit of lignite which it contains. On the Sabine river an outcrop of 14 feet in thickness is reported in the banks. Nine miles south of the above-mentioned outcrop 3-1/2 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 sold for blacksmithing with success. This coal contains, on analysis, 57.94 per cent ash, 38.32 per cent fixed carbon, 38.72 per cent volatile matter, and 16.61 per cent moisture. It has also 1.94 per cent sulfur.

MARINE CLAY BORNE.

The deposits of this group are resting directly conformably upon the lower lignitic. North of the Vicksburg, Shreveport and Pacific Railroad these deposits along their western boundary trend northward, while south of this railroad course is nearly due south. The eastern boundary of this group passes through Gibbstown, in Bienville parish. This formation forms a gentle slope to 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 underlaid by this formation, which rests conformably upon the Claiiborne sands and clays. In lithological and physical structure this group is strangely similar to the lower lignitic, from which it is separated by the marine Claiiborne. Beds of Hanikam are often carried up in this formation, and they are rarer and not so thick as in the lower lignitic.

While the above groups were being deposited, the very level or slowly emerging from the gulf and the rivers and creeks were etching a landscape similar in topographical features to that presented today. Where here the scene changes and a slow submergence takes place, Muddy shallow sepa prevail and a heavy deposit of gray clay is placed over all the hills of north Louisiana. These clays are called by Dr. Leach ARCADIA CLAYS.

"They cross the state from east to west, resting upon the croched surface of the lower lignitic, marine Claiiborne and upper lignitic formations, reaching northward into Arkansas, westward to Texas, and extending across the flood-planes of the Mississippi and southward to the calcareous marls and limestone 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 bottom lands. The water coming from them is remarkably pure, while the soils made from them are cold, tenacious and hard to drain. Where these clays are made from the sands and sandy clays of the surrounding hills, they give soils of fair fertility and susceptible of great improvement. In Bienville and Webster parishes they constitute the soils of the prairies 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 northern 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. Leach, under the auspices of the geological commission, 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 are the base of a vast extent of country solely, cause an entirely different vegetation, of which hawthorns, persimmons, black haw and crab apple are the principal causes, 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 Vicksburg they occupy frequently protrude through broad patches of sandy clay and drift, island-like, conspicuous through the break in the veg- etation occurring at intervals. This diatomical material, mostly indurated yellow marks gradually downward into calcareous gray clays, especially exposed along their northern boundary line. Frequently white and yellow limestone bedders are scattered promiscuously over the outcrops, more rarely limestone lobbies a few feet in thickness is thrown up on the hills. Zeuglodon bones have been found on the edge of the parishes, the most characteristic fossil of the Jackson of Mississippi. They are found frequently on a level with the Jack- son beds, on account of the deep erosion they have sustained before these strata were deposited.

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 bedders. Perfectly conformable, they rest upon them, and no change in the topog- raphy of the territory they occupy, nor in the rocks of the formation gracing the line of outcrops, marks a new geological sub- division. With the underlying beds they have the baid prairies and the lithological material of the common. The material of "yellow calcareous fossiliferous marl," are similar, if not identical, in composition, with that of the Jackson group. The unsalubrity, as well as the unhealthiness, of these beds is like those carried by the underlying formation, of bad quality, and the soils possess the same qualities as the Jackson group. In a narrow band, their northern boundary very irregular, though sub- parallel to the northern boundary of the Jackson bedders 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. This border outcrop is frequently marked by the drift, appearing only in isolated spots in the sandy sheet. They are of the same economic importance as the Jackson bedders.

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 mark 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 it, its northern boundary line and advancing in a southerly direction, we notice a rapid thickening of the stratum, and gradual light of the contact of the underlying formation, notwithstanding the hills and bluffs are steep, not infrequently rising almost perpendicular to the line of contact by above the country drainage. More than any of the previous regions described, it has the plain structure preserved, though occasionally broken up by small hills. Instead of the well rounded hills and more gentle slopes of the ridges occupying the region north of its boundary, it slopes sharply downward in a steep angle, rapidly towards the gulf, presenting wide valleys with steep walls, and their tributaries, narrow gulleys with bare banks, sometimes several over 100 feet in height. Frequently the country roads wind along a narrow ridge, falling steep to either side for miles. Occasionally, however, the features of erosion resemble somewhat the country north of it, where the drift- sands have accumulated, forming sections usually covered by terraced land, rising 50 or 100 feet in some southerly direction. The landscape these rocks offer is very mo- tional. The open woods of the longest plains, as far as they can be expected, and the green turf, interrupted by bare spots of the gray sands, derived from the underlying sandstones of the lower series, plug 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 the through-bottom, and sometimes 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 inter- rupted by drift material and outcrops of the underlying formation, almost to the north boundary of the grand gulf rocks. Over large areas of the terraces of the gray clays, the Jackson and Vicksburg rocks, and sometimes even mantle the outcrops of the lminated 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 extending with their composition with the drift and, mixed with clay of other formations, they form the bottom soils and the covering loam-sheet of the di- nage. In fact, they can be traced just as to the circumstances under which they have been deposited. Throughout their area they show the involution structure. To judge from their physical 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 heavy tenuous clay- mottled and streaked and sometimes studded with pebbles derived from the underlying gray clays forming beds of stratification. The irregularity of these lines which show so clearly their process of deposition have been mentioned before. Pebbly sandstones and claystones, which frequently occur north of the Vicksburg, Shreveport and Pa- cific Railroad, are seldom found south of that line, and with the exception of isolated localities in the Doloi hills none have been seen. The fossil wood, however, remains to be a characteristic feature of this formation and is seldom to
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 in the formation 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 the formation, though forested in the older deposits, and the short-leaf pine, oak varieties and

gum 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, central and eastern parts they are more or less masked 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.

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. The 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 grade into the underlying red sand and clay, and are considered as restricted 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 cyathopilum have been found in 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 bowlders derived from this formation. A few granite bowlders 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 mo-nines 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 mountains to the south began to deposit 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 appearances, 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.

The Sands and Gravels of the Drift.
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 pines. 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 easterly it 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 therein 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 before the existence of our present channels. From Memphis and Shreveport to the gulf the entire bottoms are underlaid 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 such ancient clay 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 the 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 underlaid 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, shell 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:

<table>
<thead>
<tr>
<th>AGE</th>
<th>NAME OF GROUP</th>
<th>CHIEF MATERIALS</th>
<th>KIND OF FOSSILS FOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Soils.</td>
<td>Soils.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sands, pebbles, etc.</td>
<td>Sands, loams and clay.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sands and clay.</td>
<td>Sand and clay.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Light clays and white sandstones.</td>
<td>Marine animals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bricks and limestone.</td>
<td>Marine animals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marls and limestone.</td>
<td>No fossils.</td>
</tr>
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<td></td>
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</tr>
</tbody>
</table>

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 Chalmette 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 leveling against high waters these lands have become the permanent abode of a prosperous population engaged in cultivating the soil. Throughout this territory (sea marshes) levee-like 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 land could be placed under cultivation. This to a limited extent, has already been accomplished in southern Louisiana. (See Mr. Watkins' letter further on.) Recent experiments, involving the modest sum of $35,000, have been made for further land reclamation in Holland. Similar sums spent here would result in much larger and more fertile areas.

BLUFF LANDS.

Above this blue clay occur the calcareous silts and brown loams, brought down by streams which cut into those which exist at the present time. After the deposition of this clay in a sluggish, shallow sea, running well up to Cape H., 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 slaty or cloumion character. These deposits continued until both sides of this great stream were walled in by high bluffs ten to fifteen miles wide. From Vicksburg down, to Baton Rouge, La., on the eastern banks, these bluffs are continuous. At the other 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 give the impression that the bluffs were once continuous. Upon the western banks of bayou Macon may now be plainly discerned the bluff formation constituting what are known as bayou Macon bluffs. These bluffs follow this stream through West Carroll, Richland and Franklin. They constitute a large part of Sibley Island. At the southerm extremity of this island their continuity has been broken by the waters of the Ouachita and Bicou 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 Glee 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 Moreau prairies, prairies of Morehouse, Holloway of Rapides and Marksville of Avoyelles have all originated from disintegrated materials of this ancient river. But the largest results from this disintegration is to be found in the vast area of the bayou Macon bluffs in all direction. 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 materials 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 un

termined, which, when the flood recedes, is supported by the buoyancy of water, yields to the force of gravity and falls into the river, giving, in many instances, disorganized 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 boundary 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 Omohita 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. It, in northwestern Louisiana, covering the parishes of Caddo, De Soto, and parts of Bienville, Bossier and Sabine, occurs.

THE LOWER LIGNITIC

rocks, rising conformably against this calcareous ridge. In this section are the most prominent lignite beds of the State. Against this is superimposed the Marine Chalilorne, which occupies portions of Bossier, Caddo, 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 Chalilorne, Union, Bienville, Jackson, Lincoln and parts of Morehouse, Ouachita and Caldwell.

Superimposed over these last three formations, and 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.
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 12,000 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 leased 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 thoroughly protect, they will at 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, equalled by few and surpassed by none in the world in productive capacity."

ALLUVIAL REGION OF THE MISSISSIPPI RIVER AND ITS OUT. LYING 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, smaller 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 cuts and hills, and in going down along Arkansas, until the hills west of the Ouachita are encountered. Bayous Macon and Tiger are encountered after a journey of several miles through a country of eight miles from the river. Westward of these bayous begin the bayou Macon hills (shifting format of the Ouachita and Red rivers extending in a widening belt to the southward eighty-five miles, terminating in Sicily Island. Their widest extent occurs just north of the village of Franklin, in Franklin parish, and is here nearly twenty-five miles.

Descending from these hills, going westward along the Arkansas line, the valley of the Bocceu river is entered. This extremely fertile valley is here 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 Bocceu river "alluvial" 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 conduit. 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'Arbene, de Sard 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 which drain off the thick alluvial mud to tributary creeks. In Assumption county, Ark., similar prairies, with the latter soils, have, by drainage and tillage, been made highly productive.

Segmentar’s and Dubuque’s in northern Morehouse, and Prairie in Bolis, in southern Ouachita, are of sufficient size to merit a distinct coloring on the map. The ridges that separate the prairies Mer Rouge and Jefferson lie at the eastern foot of the ridge in Morehouse parish. They are extremely rich in the red bayou, and resemble red, and properly belong to the “cluff formation.” The name of the former, Mer Rouge tied esc, is derived from the prevalence of a sumac (Rhus copallinum), 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 banks are entirely covered with a luxuriant, levees constructed and maintained at public expense extend this entire distance, and protect the lands from overflow. In few places will it be found that the highest lands of this alluvial region are immediately on the banks of the river. This is true of every stream that flows lower than the main river. 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 landscape 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 Tennessee, 20 above the Lafourche and 10 above Monrovia on the banks of the Ouachita. Before the days of levees, every overflow carried the waters to these lower levels and frequently filled the lands with clay even 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 northern Louisiana the tree growth of the front land is cottonwood, which is supplantcd by the willow on stiff back lands. 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 anteceded our present river, and one which possessed little or no current. They closely resemble the clay soils along the front of the sugar swamps. They are universally known in north Louisiana as “buckshot” lands, on account of the excellent quality of 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 producing the most productive and durable soil in the world.

Analyses made of similar soils from Mississippi by Dr. Hilgard show them to contain over 300 pounds of the richest humus on our surfaces, and “justify the reputation of being the most productive and durable soil of the Mississippi bottoms. Unlike most other peaty 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 condition. This results from 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 doubless to its being traversed by innumerable line cracks and underlaid by gravel or sand) it drains quite readily. The front lands are also called “bird’s foot” soil and by the similarity of the “buckshot lands,” with which they are compared, they would be held of the highest value. Drainage and irrigation will greatly evoke from these soils the highest yields.

SOUTH OF RED RIVER

The scene changes. Both the crops and the landscape vary greatly from what has been described. Sugar cane now becomes the chief crop, while the cultivable soil adjacent to the banks decreases in width and descends 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 minute of the “buckshot lands,” with which they are compared, these would be held of the highest value. Drainage and irrigation will greatly evoke from these soils the highest yields.

Sometimes detached portions of high land, having no present reference to any of the existing streams, are found four to six miles from the longest courses. They are usually covered with timber and in clearing, the latter is burnt, hence such clearings are usually known as “burnt-out.” In this country the rice grows up out of the marsh and abound in swamp cane, which furnishes excellent grazing for stock in the winter. To these cultivated lands are found in large numbers, and hence were called “Vacheries.”

As we descend the Mississippi, the soil of the flood plains varies 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-
vitated into three classes—‘sandy,’ ‘mixed’ and ‘clay.’ The term ‘sandy’ only in the proportion of clay they contain—those with the least are called sandy, and those with the greatest amount stiff. The mixed soils are intermediate between the two. All three classes of sandy soils are the most esteemed, being easier tilled and drained. Their relation to heat is such that they are the last to start seed germination 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 and contain, usually, more rapid, they are associated with 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 all soils in which the sandy and stiff soils are capable of the three. If it happens that all three of these soils may occur in a small field. In fact, so frequent in the immediate vicinity of Baton Rouge is an unusually large quantity of excellent lands. The black buckshot lands cover the entire of the parish, sandy lands being limited 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 confluence of the sugar and cotton belt, with an equal capacity to grow both cane and live-fool, what is rare in other sections—immense sugar and cotton estates contiguos.

The elegant homes and well improved plantations of Pointe Coupee are the result of the supreme fertility of the soil. The curb cuts-off of the Mississippi river, furnish pictures which for attractiveness and beauty are unequaled in this or any other section. Besides the large amounts of cultivable lands adjacent to the Mississippi and Atchafalaya rivers, this parish contains also considerable belts along the bayous of Moreau, Telsworth, Conneaut, Cowhead, Latuneche, Fisher's and Fordoche. In fact the lands along the Fordoche are not only extensive, but famous for their produce fertility. This parish has the largest levees in the state, and they protect from overflow thirteen of the most fertile parishes of the state. Mobile and Grand Gulf levees, large 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.

Iberville, between the Mississippi river
LOUISIANA.

and Bayou Grosse Tete on the east and the Grosse Tete and the river are rich in timber.
Bayou Grosse Tete, Maringouin and Des Allemands furnish belts of highly productive
lands, from one-half to two miles in
width.
Between the above mentioned bayous
extensive swamps prevail.
Bayou Alabama and Grand river both
furnish plantations on their banks, while
on the tributaries of the latter, bayous
therefrom have been par
tially settled and will, when the levees
prove protective, be extensively occu
pied by farms and plantations.
Bayou Plaquemine, the connecting link
between the Mississippi and Grand rivers,
now closed at the former, is a large and
habitable stream, thickly dotted on its
banks with well improved farms and
homes.
The thriving town of Plaquemine, situated at the intersection of this
bayou and the road, is replete with its
much of its prosperity to the transporta
tion of products (now chiefly cypress
wood) to the coast.
In the southern part of this parish, Bayou Barataria, Lafourche, and
Manfait furnish arable lands back
north of Lake Natchez, by which they are
distinguished, and there is a small por
tion of Iberville parish on the east
bank of the Mississippi river.
Descending the Mississippi river the
mouth of the bayou 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.
Sugar and Sorghum lands have the best
estates in this or any other country.
Bayou Lafourche, one of the few original
bayous of the Mississippi river still left
undisturbed, debouches from the river at
this point and flows on to the gulf through the parishes of Assumption and
Iberville, furnishing along its banks some
of the most fertile lands on the
globe.
The town of Donaldsonville, once
the rival of New Orleans and Baton
Rouge, is now a delightful resort of
these streams and is the county seat.
The large plantations of this parish are
along the river and bayou Lafourche,
barataria, and the larger portion of the area
on the smaller bayous in the eastern
portion of the parish. It is highly prob
able that some of the lands in the
northern portion of the parish are not
al
luvial, but belong to the bluff formation,
which here finds its southernmost exten
sion on the eastern side of the Mis
sissippi 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 side.
Here, the northern side, for at Jefferson
College, in this parish, the river turns
south east and then east, and south
direction until it has passed the city
of New Orleans. The high land on the
river is heavily occupied with extensive sugar
plantations and sugar refineries.
North of this land are to be found the
vacheries upon which the famous Perque
tobacco is grown. Here the drainage is
into lake Maurepas, only through Des
Acadiens.
South of the river the cultivated border
bench is absolutely unknown, bounded
contracted by the appearance of the marshy
ened westward in a belt of about six
miles in width a little beyond the princi
pal 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 the Marreps (the upper edge of
which is the western boundary of the
parish) and pass Manchac on the north,
and lake Des Allemands on the south.
These latter lakes and the river are to be
found extensive and highly productive,
all in excellent state of cultivation.
In this parish the raising of vegetables
for market is quite extensive
ly practiced, and the fields of cane and
market gardens frequently alternate.

The parish of

ST. CHARLES,
on both sides of the river, with the large
ter portion on the southern or western
bank of the river, is but 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
tightly populated.
Bayou des Allemands, which unites
Lake Maurepas and Washin, and
forms the southwestern boundary of the
parish, is also sparsely settled. Beyond this
bayou is the grassy prairie Des Alle
mands, and the point where Lafouche parish and the
section of the Southern Pacific has
constructed its roadbed.
Jefferson parish stretches from Lake Pontchartrain, on the Barataria
gulf, to the south,
where a small portion is north of the Mississippi river, this small portion, together
with the belt on the south side, consti
tuates the chief tillable land of the
parish. On the higher ridges accompanying
bayous Barataria, Des Allemands and Des
Familles may be founded, to which
plantations, and truck gardens.
The southern portion is covered with swamp,
marsh pastures, and woods, intersected
by a network of bayous and canals
resorts of fishermen and duck hunters.
Numerous shell heaps are found rising
above the water, and corresponding
rama of the clam or Guthat, 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 Yerette) permit of their passage from the Missis
issippi river through this bayou to the
gulf.
Grand Isle, a favorite pleasure resort,
situated at the head of the estuary of Barataria bay, is reached by a line of steam
ers, whose return trip is always made by
steam.
Metairie ridge, running though this parish,
between the river lands and lake Pontchartrain, is densely settled with
many market gardens. This
Orleans Parish.

The city of New Orleans occupies near
fully all of the bayou and 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 Poucertain. This section is traversed by a link of 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 New Orleans, the line is much more protracted and many plantations devoted to sugar, rice, and truck crops. Below New Orleans the river occurs in small parishes of St. Bernard and Plaquemines, forming a bayou that runs north of the side of the river and the latter on both sides, following it to its mouth at the city of New Orleans. The most of its plantations and market gardens on the Mississippi river and bayou Terre-aux-Peaux. Beyond these streams the tracts of cultivable land are few and insignificant. 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 few settlements of fisherfolk, which are for the most part unfortified, save temporarily by sportsmen seeking fish or game.

**THE PARISH OF PLAQUEMINES**

has its cultivable land lying entirely on the east side of the river, a little below New Orleans the belt of high cultivable land varies from one to three miles in width, but in degree of improvement is by far the best of this great river. This section is so narrow and the visiting stranger wonders that the river does not cut through it and thus shorten its route to the sea by a distance of a few hundred yards. The banks below the forts are, at Fort Eads, at the mouth of South Pass, where the jetties have been so successful, much improved by Captain Eads. Fort Eads is quite a village, inhabited by employees of the jetty company, which maintains a lighted light at the mouth of the stream. The custom-house inspectors are the quarantine officer. In the upper portion of the parish some excellent sugar estates, very improved and landscaped, with permanent 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 better 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.

**Lafourche**

Leaves 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 land between both river banks from Fort Eads to Lafourche is from one to one and one-half miles wide, and is very densely populated. In fact, it has the appearance of a concentration of population in many beautiful homes and fine plantations.

Beyond the lands cultivated on the bayou are detached bodies, called bruces, situated from four to ten miles from the bayou, which have been cleared and cultivated. The soils of these bruces are extremely rich, and the levees on the Mississippi river make permanent walls of protection these lands would be extremely valuable and desirable. Sacramento, near the bayou, St. Vincent, Big and Little Texas and L'Abadie are the most noted of these bruces. The fishing-camps canal, constructed long ago, the original connection Lafourche with lake Verret, has a large quantity of cultivated lands along its banks, and is very valuable. This canal has been closed at the bayou, and is now used only for drainage.

F. 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 cultivable land, it is bounded by sea marks. The lands along the bayou are in number of cultivation within twenty-five miles of the gulf. Large sugar estates, well kept and improved, cover the bayou as far down as Lockport. Truck growing and poultry raising are much practiced by the small farmers of this parish. Below the mouth of the bayou the settlement gradually diminishes in width, and in the lower part of the parish it scarcely obtains a width of a few hundred yards.

**Lafourche**

Narrow strips of cultivable land are found on bayous Chechey and Chalubanne in the northern, and bayou Boeuf in the southern part of the parish. Some arable soils of good tilth and arable demand and Roen. Extensive and excellent tracts of land exist, bordering on bayous Lafourche, Coquille and Middle. Scattered tracts, capable of habitation, are found on bayou Des Allemands. Live oak ridges are found on bayou Bien and are open grassy prairies, which constitute a peculiar feature in the landscape of this parish. "Trembling prairies" also abound. They consist of matted grasses and decayed vegetation, partially floating upon a subterranean stream, upon which cattle graze, vibrating with each tread. Beyond the parishes, the levees 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 Barataria, Echu, Echou, Little and Big Caillon, DuChien, Au Large and Cade, run nearly north and south through the parish, while bayous Black, Chackahoua, Tigre, Cours, Chene and Penchant have a westerly direction. These bayous are small streams save when serving as outlets for the Mississippi in times of high water. In the upper portions they are narrow and shallow, frequently running dry in summer months. When lower, they widen out, and with constant attention can be kept navigable the entire year.

In the city of Houma, as elsewhere in the parish, cotton is the chief crop 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 cultiva-
table land extends within ten or twenty miles of the gulf and is succeeded by
high bluffs only in the narrow way to the salt marsh nearly at the gulf. This
parish has a chain of islands off its coast, the most important being Timbi-
tulle and East Island. These are sometimes swept by tidal waves, and not-
withstanding the awful catastrophe which
went on annually these years, island are they are still visited by pleasure-hunters.

Avoylees parish is almost wholly al-
luvial, lying squarely in the great flood
plain of the river on the 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 Missis-
sippi 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 ex-
tremity of which the Red river termin-
alizes. Farther north, after passing the
great flood plains of the Mississippi
river. Cut off from the mainland are the prairies of Avoylees on which the
parishes of Marksville is situated and
Chausse des Grus.

Southwest of these prairies are iso-
lated patches of bluff lands, extending
from near Egg head of Red river to
bayou Rouge. The general surface of
deep bluff and prairies is well above
high water, and their soils resemble those of the bluff lands of West Felic-
iana and East Baton Rouge. Some of it
is grayish silt, while others are of the
lithomud variety. The bluffy lands of western Avoylees are like those of
Rapides, of which they are a continua-
tion.

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 de-
scribed of the Mississippi, but its spe-
cial features mark this river. First—The
great raft in the extreme northwest por-
tioned by the river, Alexandria, falls
below Alexandria, due to the river cross-
ing 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 be-
fore the time of the present era. This clay
is of similar origin and date with the
buckshot clays of the Mississippi.

The soils developed by the river are
light and sandy, and can not be
utilized 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. Hill-
gard classifies the soils of this region into
four classes.

First—Front land soils lying near the
river and main bayous, and of a reddish
or yellowish red loam, light and easily
tilled; these are 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 masses of water oak, cottonwoods and
buck-
erly and horn locust occurring in patches.
This soil is very productive.

A capital soil.

Elk prairie soil, occurring in patches, an
exceedingly heavy, close intractable
day, mostly in low ground. It bears a
stubble of hackberry, ash and elm, with
fine growth of cattog. It seems practically worthless at present.

The last two soils are doubtless de-
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prairies through which it has cut its channel.

All along the banks of the Teche can be seen the traumatic growths of willows, and the black prairie is everywhere noticeable. Since these soils occupy only portions of the parishes in which they occur, a detailed description of them cannot be given here, but, under other heads, it may be said here, however, that these soils occupy a part of the lower Atchafalaya basin, and are characterized by the black prairie here and there over the lower Atchafalaya.

The parishes of Vermilion, Iberia, St. Martin, and St. Mary are particularly rich in black prairie. These soils are quite readily cultivated. They have been found excellent for rice, cut and cultivated sugar cane, and in general are found to be alluvial soils capable of producing good crops of sugar cane, rice, oranges, etc.

The Louisiana Reclamation Company was organized 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. L. Watkins has claimed a large area in southwest Louisiana, and is now having it successfully cultivated in rice and other crops. In special report No. 7, Watkins gives information as to the habits of the swamp birds, and 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 to 25 feet wide and 2 to 3 feet deep, with 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 ditches propelled by steam power, passing through hill country, 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 eb and flow of the tide. This is supplemented by the use of powerful water pumps. The effects of the improvements will not accomplish the work we readily move upon the canals to the spot our ditching, plowing and cultivating engineers can do the work. Thus arranged, with control of the water, these blocks of land are in condition for the most productive rice culture. Rice may be planted any time from February to June, very much as the same when and upon ground similarly prepared. When it has reached a growth two inches high water is let in upon it and the ground is flooded, care being taken 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; then it is allowed to 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 when the full season of 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, 1883, 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, sawers, reapers, etc.; thirty-two plows in gangs, having a capacity of 75 acres per day, two teams of 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, St. Francis, and perhaps small portions of Ascension and St. Helena. In length this belt is about fifty miles, its width in the northern part is from 3 to 5 miles, but further south it widens to nearly double this distance. Just below the city of Baton Rouge these bluffs turn to the south, and each side of 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 are at 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 of the formations of the state), and treated in a most irrational and unscientific manner, yet they can be made, with proper attention, to produce even better crops than at present. The bluffs in this area 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 exclusive privilege of cultivating alluvial lands elevated above the floods, and susceptibility of the best of drainage.

On the eastern side of the Mississippi river only scattered remains of these bluffs are found. They run through West Carroll, Richland, Franklin, and then into Terrebonne, Lafourche, and finally into St. James. These bluffs are cut through the alluvial subsoil and are underlaid by coarse gravel. The bluffs are therefore in a general divided farming be more advantageously conducted. These are probably the finest hill lands in the world. Far above overflow, here the farmer enjoys the exclusive privilege of cultivating alluvial lands elevated above the floods, and susceptibility of the best of drainage.
large. In places these bluffs consist of an open boulder deposit, or of gravel, laid by the eolianurous silts of the loess formation, which in turn overlie the blue clays of the Mississippi bottoms. In the general degradation of these bluffs and their subsequent transportation, assemblage and deposition by running water, soils of all grades from a rich, deep, black prairie to a poor, gray, silty piny woods, have been formed. Accordingly we find, to the east and south, in southwest Louisiana, extensive development of these soils and their subsequent transportation. The soils of the extreme eastern portion.

These prairies lie in Cacassoe, 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 Opiusis prairies, and has been rendered famous by Longfellow, who has styled it the "Isen of Louisiana." Until the last few years, 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 agricultural fertility is here to be seen. Over 7000 families from the prairies of Iowa, Nebraska, Kansas and Illinois have entered their "Lares and Penates" in this balmier land and more prosperous agriculturist 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 aluvial lands on the river and the hilly lands of the extreme east, and are quite hilly and broken, with ridges rising several hundred feet, w.c.a. ravines or narrow valleys. In the center 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 valley silt, which gives an enduring loam soil. In the southern portion of the parish the bluffs are not so elevated—the level areas more extensive and the tracts more 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 are depressions, alternations and intermixtures of bluff and pine soils prevalent for a short distance, when the latter continues on through the parish. East of the Contoocook the soils are more broken, the short-leaf pine predominating in the woods. The appearance of the long-leaf pine is first evident when passing this stream, which marks the point. 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 extensive plantation tracts of the oak and pine uplands. It has two tracts of alluvial lands, one board- ing the Mississippi and the other along bayous. This parish is the principal point of land settlement; the lands are well drained, and are improved and cultivated. The land is a mixture of alluvial, with the dark orange colored subsoil near the surface. These soils were originally covered with a thick growth of piny woods, and the subsoil is a mixture of sand and loam, with an undergrowth of swamp cane everywhere. The original soil was a black, deep, easily tilled loam of such productive 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 the 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 claimed from the banks they were occupied by the large planters from the hills, and hence this parish became more and more the home of able farmers and untimely their thrifty effort has seemed to be 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, with the best of clearings, with magnolias, dogwood, short-leaf pine, and a few magnolias. The surface soil is grayish brown, or I own overlying a red sandy clay subsoil, and is good. This 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 thick cypress, swamp gum, and other trees for cattle during the winter. This parish is noted for its fine timber, tur- pentine and cattle.

Plaquemines 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 point where this stream empties into the Mississippi. The Boeuf bottoms runs the entire length of the parish. On the banks of the Macon the bluffs often reach the height of a house. On the west, crossing 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 a second parish, which is 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 out over the country. Occasionally islands of bluff formation, elevated several feet above the general level of the country, are encountered. This parish has largely suffered in the past by these periodic floods through Arkansas, and if the levees now constructed at the joint expense of Arkansas and Louisiana are not continued, it will become one of the most attractive parishes in the state.

Franklin parish, south and east of Richland, is almost entirely of alluvial character, being a narrow alluvium lying between bayou Macon and the hills, and a similar belt on the west by bayou Boeuf. The lands of this parish are as well suited to the growth and yield fine crops of corn and cotton.

Batches of bluff lands occur in Catahoula, Rapides and Avoyelles. Extensive areas 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 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 which were disintegrated by 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 Courbaleau, a tributary of the Atchafalaya, is navigable as far as Washington, in this parish. From Washington and Opelousas the prairies extend to the western boundary. These prairies are, in the extreme northwest, of the silty character. South and east of this, running parallel to the bayous, Opelousas and Iberia, 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.

Bayou Cocodrie and Boeuf (which together form the Couteballeau) 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.

Acadian parish, recently formed from St. Landry, is entirely prairie, the latter consisting mainly of the brown loam and black character. This is one of the most productive if not the most fertile, and when properly drained, as it will be in the near future, will be one of the most fertile. Nearly the whole of this parish 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 this extreme degree of impermeability, the prairies, preventing drainage, this water has to be evaporated. The result is seen in the numerous water grasses found everywhere. This parish is numerous bayous and rivers, which have cut channels 20 to 40 feet deep, which, if utilized, furnish drainage canals for the country.

A system of drainage ditches were established connecting every farm with these water courses and ridge culture with deep plowing practiced, quarter draining practice and the use of cattle or mules to grave rains could be rapidly removed and the subsoils thoroughly aerated, these soils could be made profoundly productive. The rapid draining of Adair Parish to this parish will soon realize the necessity for such action and secure proper laws, either through state, legislative action or through the action of individuals. 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 northeastern boundary of the parish. The bluff lands are well developed in this parish. This is one of the smallest but most fertile parishes of the state.

Vermilion parish in the northern part, is all prairie, the black prairie, the alluvial lands lie along bayous Vermillion, Quee 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 are still surviving. Along the banks of the Vermillion river, with the exception of two islands with cultivable ridges, near the gulf, are uninhabited and uncultivable. This parish is mainly occupied by the Acadians, of French-Canadian origin, but large numbers of white men have recently settled therein, and, from present prospects, will form aGap with the prairie.

Calciasie parish has increased in taxable values and population in last ten years more than any other parish in the state. Its extreme southeaster portion is black prairie, the northeast and southwest portions are silty prairies, which, although not as productive as the black prairie, are rather productive. This parish is mainly occupied by the Acadians, of French-Canadian origin, but the number of white men that have recently settled in this parish is enormous and finds an outlet through the Cajun river to the market along the coast and by rail to the states north and west. This parish has 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, Wavel, Icwa City, are, attest their thriving agricultural prosperity. The prairie soils, like those of Acadian need drainage before they will show their true productive power, and some general system must be established for the benefits of the future, or the land is ruined. The prairie soils, which are fertile, but need drainage, before they will show their true productive power, and some general system must be established for the benefits of the future, or the land is ruined. The prairie soils, which are fertile, but
cultivation until levelled. In this parish occurs also the famous sulphur mine and public sulphur wells. All the prairies of the last being taken by the Southern Pacific Railroad.

Iberville parish presents a variety of features. It is largely alluvial, belonging to the Mississippi delta. 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. This is above overflow and yet below the general level of the country. From this belt there is a rise of from 6 to 10 feet to the black prairies, which extend some distance into 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 district the sugar thicket is from the height of 160 to 180 feet—the last remains of the western boundary of the great river—viz: Petite Anse, Mulberry Bayou (240 acres); Grande Cote, or Week's island (2300 acres), and Orange island, on the west side (Veigneur (2250 acres), now the property of Mr. Joseph Jefferson, the great comedian. These islands were originally covered with timber and the soil 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 Tortne the land is mainly of the brown loam rolling prairie. This land and alluvial borders the Teche here as in Iberville. On the east it sheds off into the alluvial prairie country; the extremity through the islands, 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 Mermentau, and the Atchafalaya is a tract of high land called Putte a la Roza. 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 Tortne. The Teche is navigable to St. Martinville. All along this stream sugar plantations occur. Mixed farming also practiced by the frugal Acadians, which mostly populate this parish.

St. Mary parish is almost wholly alluvial. The Calcasieu flows from south of the Teche, including the Cypremont prairie and the islands of Cote Blanche and Belle Isle, are doubtless its most fertile portion. St. Mary is the sugar-producing parish in the state, and the magnificent sugar estates lying on bayou Teche, with their palatial resid- dences, fitly supplied with gold plate, their neatly kept quarters, and the immense sugar-houses, present a scene that would justify much time and trouble to write of. This parish is the loveliest 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 the river is higher than the Mermentau. The characteristic red tint of the land can be seen as far down as Franklin. Cote Blanche island, with an area of about 2000 acres, Iberville, St. Martin, and Vermillion bayous raise in all its features those islands described under Iberville parish. So, too, with Belle Isle (area 550 acres), which lies on the western boundary of Atchafalaya bay, the most southermmost point of the ancient bluff formation.

Cameron parish is mainly sea marsh, with only a small portion of the northern part of salt marsh. Along the Calcasieu, Sabine and Mermentau rivers occur rages of excellent arable lands, which are thickly wooded with a native oak and oyster is the chief employment of these coast dwellers. The soils are excellent, and delightful dwelling homes are plentifully seen. 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 mixture of rich red clay and heavy loam, intermixed with clays and hickory, the latter predominating on the best soils, and their presence may be used as a guide in the selection of the surface soils of this region are supplied mainly by the sands and clays of the "red sandy clay" formation, while the creek's 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 set- tled mainly by small farmers, who, as a rule, are prosperous, happy and contented. Mixed farming, as always practiced, 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 admission, is more invigorating or invigorating. Little or no immigration has yet been secured, yet the evidences of thrift and improvement are visible in modern comfort of these farmers and improvers. Louisiana is more inviting to the man of moderate means, accustomed to do his own work, than the good uplands of this state. They are more systematically and conversely 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—

1. Black sandy.
2. Gray sandy.
3. Yellowish red sandy.

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 underlaid 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 peasthe 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 an 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” from which 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 a 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 Catahou, 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, corn, 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 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 underlining 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 several 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 valley sides, gray loams are to be found. Where no such washing has occurred the pure "gray clays" exist. 

These alluvial bottoms, the former usually exist and are very productive. They are, however, subject to overflow, and, therefore, are usually not highly es- ter broken and have improved 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. 

CADDI 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 swampy. The parish seat, Shreveport, is in the eastern terminus of a ridge dividing Cross lake from Bossy 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. 

BOSSTIER PARISH 

is composed of good uplands and splendid alluvial bottoms. The former lie mainly in the northern and eastern, and later in the southwestern part of the parish, and is protected from overflow by levees built and held up by the Bossier levee district. The peninsula running down between Red river and lake Bistineau, lying on the northern border of Bossier, contains the ancient seat of the Bossier parishes, and locally known as the "Pont," has soils somewhat peculiar, consisting of three kinds: First, consisting of the high, fourths of the levees -- a fine sandy, blackish loam, with a yellow sandy loam subsoil, with oak and hickory lumber and a few scattered shad trees; second, a yellow sandy clay loam with similar subsoil, with few short-leaf pines; third, blackjack ridges but little cultivated and very unfertile. 

The 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 Dorchelet, which, alternately, in the southern part of the parish, is entirely cut up by bayous. The northwest is the flood plain of bayou Bistineau. A level country extends from the Arkansas line to this bayou, bounded on the east by bayou Dorchelet and Bistineau. This country is of varied fertility. Some of it is covered with short-leaf pines and is of only fair quality. It is improved with tall black and post oak, with white, crawfishy soil, but slightly better, while another portion, well drained, gives excellent crops of cotton, corn, and rice. East of this, the lands are rolling, with alternations of red and gray soils. On lake Bistineau and Black lake bayou is whitchit, clavy 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 excellent lands. It contains some of the highest elevations in the state. North of the Claiborne 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 Biscailze, in Bloulevard parish, and crossing the Vicksburg Shreveport and Pacific at Gibbland, 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 the region is one of the best lands of the parish. The ridges between the bayous Corney and l'Ouivre are high and broken, but are of the red land class. East of these, 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 good farming, but this is the country is less rolling and nice farming lands exist. A considerable area of alluvial lands lie along the bayou d'Arbors or the Ouachita itself. This parish is without railroad connection with the outside world. In high water small steamers ascend bayou d'Arbors as high as Farmerville. The river levees have, 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 latter are mainly oak and hickory uplands, though in the southwestern part of the parish is a considerable area of long-leaf pine. In the northeastern section, north of the Ouachita, the large-leaved magnolia (magnolia macrophylla), a rare tree elsewhere in the state, in the swamps of the bottoms two tons of wood on a sandbar is a valuable timber. Between the oak uplands and long-leaf pine region, occur the famous swamps covering several square miles, known as the Cheniere an Tondre. 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 l'Isard 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 uplands more or less reach down on the plains 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 depositional lands and run out over a sandy plain. These lands are excellent, drain well and bring annually large crops. The Beaver 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 hickory lands. The unlands 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. This 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 prairie patches. Between it and the alluvial flats of the Ouachita occurs a bed of good uplands; also interspersed with prairie outcrops. The land here toward the Ouachita 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. The Ouachita, 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. 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 are in some of the southeastern part. A lowland belt of the central prairie region covers the northwestern portion of the parish, while the bluff formation underlies between this alluvial and the long-leaf pine hills, starting at Sicily island and ending at Catahoula lake. These bluffs are several fathoms high and were water formed, 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 end 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 Indepthanland, there are clumps of such tree loving lines as the walnut, tpi, etc.

In the western portion "log wallow" and "dirt road" are famous provoking pastoral patches of true black prairie. The largest tract of black prairie (Pendelvaris) is in the fork of bayous Castor and Dugdowell (Crawford) lake in the parish. This was cut off from the bluff lands of Franklina by the Ouachita river and from the great alluvial plain by bayou Louis, is many 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 junction, or grass, this is almost as Holiway's and Ayochees 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 soil than any other parish, estimated at one-half of the parish, giving lands too much hill 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 prosperous
wood industries, the short-leaf pine, are fair indices for guid-
ance in the purchase of land. This parish is filled with small but intelligent, pro-
gressive farms. The lands are being improv-
ing, both in material wealth and in social
and intellectual development. Ruston, its
county seat, is a thriving town, with ex-
cellent churches and schools.

**JACKSON PARISH.**

Lying south of Lincoln, is composed of oak
uplands and long-leaf pine flats. The soil is nearly
an alluvial, red and black sands, but north of Vernon, the county seat,
occur prominent red land ridges, which are very produc-
tive. 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
covered with oaks, mixed with the
short-leaf pine, and are fairly productive. A small proportion of erogenous black
prairie, underlaid by limestones, is re-
ported near Rochester in this parish, which is similar to those outcrops in Winn and Bienvenue.

**BIENVILLE PARISH.**

Is mainly oak uplands, with the yellow
sand clay predominating. The lands are
point rolling, sometimes
level, especially in the west-
ern 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 red
subsoil appears, often with concen-
tions 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 outcrops of salt beds, which were
made during the war. These are
underlaid by gypsum and erogenous lime-
stone, and from the latter good lime could be
obtained. It might be found
able to use such lime on these soils.

There occur also in this parish outcrops of calcareous and green sand marls, which also
nutritious of these lies
waters of the Sabine and Red river
channel in this parish. The bayou, Mansfield,
the parish seat, is situated on it. Near the
Red river the country is hilly and
broken, constituting what is known as the
ridges, red and black sands, and the
bays, and are not very thrifty, though
the valleys are fairly produc-
tive. Lakes and bayous interlacing each
other, form the bayou system which at the
western edge of Red river. On many of the
bayous of this parish occur many
small sandy islands, which, when well drained, make fairly
remunerative crops. On the Sabine slope
of the divide occur generally rolling pheno-
cena, with red and black sands, and
valleys between. Grand Cane bayou fur-
nishes the richest part of the parish.

**NATCHITOCHES PARISH.**

Is made up of a variety of formations, with
the long-leaf pine hills constitut-
ing nearly one-half of the parish. The river
bottoms are next in area, fol-

In this parish there are many
tracts 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 erogenous gypsum and limestone. Between Black lake and
the alluvial plain of Red river occurs
the Cane ridge, with short-leaf pine
lands. The two ridges have
of sands, red and black oaks, and red
lands. The southern part of the
parish is underlaid with erogenous black sands, and the
lands are productive.

In the northwestern part of the parish the Red river parishes
and south of the Red river are the
parishes of central prairie land. The
area of the state, north of the Red river is
all occupied by large planta-
tions and fine old homes. These lands
are as fertile as any in the state, and by
their large annual yields make Natchi-
toches one of the largest cotton-produc-
ing parishes of the state. Natchi-
toches, on Cane river, is the oldest settlement in the state, and has now a
large commerce with the outside world by a branch road to
Cypress, on the Texas and Pacific Rail-
road.

**SABINE PARISH.**

The lands of this parish are divided between
the good uplands, central prai-
ries 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 Toceau is a sudden transition from long-leaf pine sands to the bet-
ter lands of the central prairie.

On the Red river, 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 northwesterly direction across the
parish.

The 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 fur-
nish the best lands of the parish.

Sabine is noted for numerous small
but thriving 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 Biedville and Jackson, a small part of Omachita 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 struggling oaks (chiedy 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 where formerly came the formation just 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 ploceone or post ploceone, 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 without 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 piny 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 it has 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.

Hill Parishes of the Long-Leaf Pine.

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 (Arenada clays) mixed with small detached tracts or belts of black prairie, treeless or with scattered clumps of hawthorn, crab-apple and hony 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 consists 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 underlyung subsoil of a deeper tint than usually prevail below the soil of the long-leaf pine region. On the Dusdemona 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.

Pendavilis prairie in the fork of the Dudameron and the lower and true cretaceous black prairie formation. The salt licks with salt springs or wells, underlaid by cretaceous limestone, occur in large numbers along these prairies. Drake’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 sandy soils of the parish. 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 Pendavilis prairie.

RAPIDES PARISH.

This parish, when 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 very sandy lands, which are well cultivated and thickly settled and give immense wealth to the parish. The Red river plain runs diagonally through the parish, dividing it from the Red river bluff, with an average width of about twenty 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 Cordrie 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 blust 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 therefrom 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 loam and underlaid by clay. Further back occurs a heavy red buck-shot, hard to drain and difficult to cultivate. This soil is known locally as the “saltpeter” soil, and is not 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 lies 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 Cascalien, Castor and Bundick streams furnish some wide bottoms, which are thickly settled, as also the best country of unimproved land. 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 main woods are chiefly rolling, undulating pine-hill country, with the characteristic sandy loam, underlaid at a few inches depth by a pale yellow subsoil. These soils are poor but susceptible of great improvement and with excellent work will prove very fertile. They can be thickly settled as soon as railroad facilities are offered, just as has been done in the adjoining parish of Tangipahoa. The Red river bluff presents one of the finest roads in Central Railroad. When transportation is furnished, all of these soils will, by fertilizers, be converted into truck gardens, far in advance of the hills, and 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 land is varied, but the parish forms a very good cattle country, the settlements being almost entirely along the water courses. Rogue Chitto, running through the center of the parish, is the largest of the few navigable watercourses. The Bethel roads can be improved, and the parish takes its rank with the most productive in the State. 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 Cascalien parish, directly north of the west fork of the Cascalien river, occurs a strip of pine flats nearly twenty miles wide. It is formed between the pine hills and the pine prairies. The soil here is a gray, unretentive silt, underlaid by brown ferruginous concretions, reaching 18 to 20 inches upon a compact blue subsoil, full of bog, on gravels or sand, cemented into an impervious mass by clay. The prairie region is the base of this last stratum, and hence are easily up-rooted by the storms. Further north this clayish stratum is gradually displaced by a yellow sandy or silt 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 come undrained soils, or is covered to a few inches by a silt loam of poor quality. Lake Poitouchtrain is partly bordered by this fair loamy soil, bearing a growth of sweet gum and lowland oaks. Along the courses of the streams, notably Amite and Tangipahoa rivers, some of the hills of oak and short-leaf pine, with a brown soil, easily tilled and fairly productive, which rests upon a foundation of sandy red river bluff, are the best of the soils of the state. This country are, therefore, along these bottoms. However, as pasture and for lumbering and the manufacture of turpentine and charcoal, these forests excel.
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, fruits and vegetables—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 soil.

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 cottons 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 Columbus to Harrisonburg, and on the Sabine from Sabine town 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 exact product 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 underlaid 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.

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<th>Parish</th>
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44,429 2,567,935 1,118,587 622,541 505,473

From the above it will be seen that upon a little over 21,2 millions of acres there has been made 622,511 bales of cotton and 505,473 short tons of sugar. The total area in cultivation is, therefore, not over one-twentieth of the state under cultivation. When all of these lands shall be occupied and the arable portion placed under good culture, what a wealth of products will 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: 13,236
  - Bluff and bluff prairies: 5,739
  - Oak and hickory uplands: 8,163
  - Long-leaf pine hills: 7,082
  - Long-leaf pine flats: 2,566
  - Central prairie: 1,550
  - Coast marshes: 7,429

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 part 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 attached 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. A vast commerce 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 impossible in this sunny land.

This erroneous impression has been produced by the persistency of our planters and farmers in growing 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 climate has been changed. Planting on a large scale is no longer popular. Unreliable labor, low prices, soil exhaustion and high money rates have shriveled 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 farmers.

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 "thick 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 field could easily be doubled. Upon the al-
Louisiana.

Lucrative lands of south Louisiana the sugar experimental station has for several years averaged over 100 bushels per acre. Sixty to ninety bushels have been obtained at the state experiment station at Baton Rouge upon the plantation and that sixty bushels are the average yields upon the rotation fields of the north Louisiana experimental station, situated in Calcasieu, upon the 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 growth, those grains sown in salt, brackish or contaminated 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 last frequently destroying it before ripening. But the seed raised and sown at the same time, will be ready for harvest in May. If, therefore, we desire an early crop of corn, we obtain satisfaction from the fact that each comes to us inheriting the habits of the country from which it came. In the north the summers are short and the tice of the year, if this best is, therefore, limited. In the south, the winters are short, and therefore, the period of repose is materially shortened and the 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 climate of our section is so mild 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, the farmers utilizing many thousands of cars in transporting their products to the western markets. Of fruits a great variety of superior excellence can be grown and apple is grown in the northern part of the state. The pear, particularly the Chinese type, all over the state. The peach will grow in the entire state and the pear will ripen in the hill lands. The native and Japanese varieties of plums do well everywhere. The apricot, nectarine and cherry are not grown in any quantity 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 same lands. So 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 in the extreme west. The loquat and pomegranate are found in nearly every yard of south Louisiana. Figs are cultivated in every parish, while in the southern section 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, lumbermen, firewood, peach, pear, crasberrie, hopt, hoop timber, sprin 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 live oak intertwine their boughs with the beech and the ash, while the holly and the dogwood bask in their shadows. Willows abound in our marshes 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 the most delicate and highly-prized exotics. Roses bloom in deep perfection throughout the winter and they and the hibiscus, oe and peonies and lilacs and magnolias and azaleas and dogwood and yew and euonymus and many others fragrance the air with their delicious fragrance, while chrysanthemums, geraniums and plumbagoes give brilliancy to every garden.

Plains 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 soil. For the guidance of those seeking a home in our state 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 steam boiler in which the juice was boiled up the crop grown. Today the scene is changing, changing rapidly. Central factories exist—some that do nothing but purchase cane at certain prices per each stalk crushed: others that grow only a part, large or small, of the large amount consumed. The presence of the large factories presupposes the existence of cane farmers in close proximity. Many central factories already exist, and others
ITS ADVANTAGES! ITS CONDITIONS! ITS PROSPECTS!

will soon be built. The fierce conflict between low prices and profitable returns has hastened the construction of a small and incomplete sugar-house, and will ultimately drive out the remaining ones. With more or less capacity to sell "suckers" for sale to these factories is quite extensive and practiced. Small farmers, with ten acres of sugar cane, can find a ready market for the crop, and with large acreages to plant, 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 large farms 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 have been greatly depressed. It is probable that the combination of bad conditions has temporarily depressed the grower of cane, but it is hoped and expected that another year will correct this abnormal condition 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. It, however, values are restored, the enterprise is more inviting than that of raising sugar cane, but not for the factories. Lands in any quantity may be purchased or rented well adapted for 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 quality of cane is grown from forty to fifty tons of cane per acre, and at present the factories are paying 80 cents per ton for each cent per pound that passes the test of New Orleans. There is a large field in Louisiana for the investment of capital in central factories and for intelligent growers of cane. The demand for 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 to the fields. Now, however, several lands growing rice was an expensive business. A few years since southwest Louisiana began to cultivate rice upon a large scale. It was observed that the rice was collected by Negroes and used when needed upon the fields of growing rice. The bayous and canals of this country were drained, and reverence was conveyed to the ditches, which carried it to the rice fields. The following are their methods: Lands are broken with riding plows, and large acreages are plowed with long hoes. The rice is sown 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 brought in by the streams. When the rice is mature the water is withdrawn and the harvesting is quickly performed by large thresher machines which successfully has rice been grown on the prairies that are now but little more than rice fields. The fact is that the average acre has grown the average rice field of the district. There is a large rice industry in Louisiana, and one of the states west

TOBACCO GROWING.

The oak and short-leaf pine hills and the long-leaf pine country are entirely adapted to the growth of the forest type of yellow leaf tobacco, which is now in such large demand for plug wrappers and smoking. Experiments at the north Louisiana experiment station have so conclusively demonstrated this fact that the farmers who have been forced to abandon sugar, 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 many thousands of dollars. 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 soil. Tobacco grown on the best soil have small values. The process of curing is by the "new barn" of Captain W. H. Snow, and is accomplished in about three days. The tobacco is sold to B. T. Gillett of Hammond, or to the station to Lordland & Co., New Jersey, for 45 cents per pound, and at such prices gave a very profitable return.

Of the methods described for the cultivation of the state it is best to attempt the growth of the cigar leaf tobacco. Experiments at Baton Rouge and Andalusia parishes have been successful 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 1000 pounds per acre, with a low yield, has 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 snicker in the axil of the lower leaf which is ready to be harvested. The selection of the first corn is gathered; the old stalk is removed and the young snicker soon takes its place and with favorable weather, as it is large and find 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 tobacconist of this country upon the merits of our yellow leaf:

"We pronounce it as fine in quality and texture as the best produce of the best sections and among the best and most skilled planters in North Carolina. In short, we think its quality could hardly be surpassed. We have seen cutters and light press wrappers who make better cuts of this tobacco, 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 of an acre as possible, and then securing a second crop if possible."

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 furnishes a valuable opportunity of raising 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."

C. W. Smith & Co., manufacturers, Lyneburg, Va., write: "We were quite interested in examining the good samples which you furnished and selling such tobacco from Louisiana. It is a valuable crop, and if exhibited in any market in Virginia and North Carolina, in the hands of good manufacturers, will bring high 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. P. 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 Tinley Tobacco Company, of Richmond, 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 having the lot, we make you an offer of $2.00 per 100 pounds on the entire lot."

GRASSES, CLOVERS AND FORAGE CROPS.

Throughout the entire south two well known grasses furnish pastures hay of the best quality, and in practically large abundance. These are Bermuda (cynodon dactyton), the finest pasture grass in the world, and crab grass (pan-

leum sanguinale), which springs up in every cultivated field in early spring, and if not disturbed will furnish a large cutting of good pasture hay in spring. These grasses grow all over the south, and, in the past, have been considered our worst enemies.

Frasier and middle Louisiana, upon the alluvial plains, bluffs and pine lands, occur many varieties of paspilum, several of which are highly esteemed, both for their succulent and p. palatable quality. These are known by the Creoles as gazon and by the Americans as carpet 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 trespedeza situata, Japan clover, covers every available space of unoccupied ground, even in the forest, affording excellent grazing throughout the summer for stock. When cultivated, produces a fine-type hay. The bluegrass, in the state, makes large crops of a very palatable hay. Many thousands of acres are now annually grown, and a number of herders are receiving considerable value upon it. It is especially luxuriant upon the bluffs and islands, 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 small scale, since experiments so far conducted have proven them to be, in many cases, unprofitable. The first essential for successful growth of grasses is to have the land suitable for good sod. 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 (arrhenatherium arenacese), planted in early fall upon good, well-refrgered soil, will secure a good crop of green and hay, and furnish two cuttings. The hay is known, in the early spring 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.

Italian rye grass (loliuitalianum) 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 soils.

Rescue grass (brunus shraderi) sown in the first cool days of the fall upon well-prepared, fertile soils, will give excellent results. Out 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 that was harvested. A well-grown stand is found in this climate, and, if properly managed, will make a perpetual winter grass.

The following have been partid suc-
cessfully: Cut rye (ryp aestivum), a good but not daim, low soils; orchard (dactylia glom-

erata), on good soil; English blue grass (festuca pratensia), especially in shady, damp places; velvet grass (cultus lan-
tus). Kentucky blue rags (poa pratensis), on good soils containing lime, and crested dogstail (poa annua) are excellent.

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

- Teff (wheat grass) (aleuraria savannah), a native of South America, becomes a crop in winter and spring and can be grown with great profit in many parts of the United States and Europe.

Bromus inermis, a coarse, rank grass, grows luxuriantly in winter and early spring, but it is not a good browse for cattle.

- Perilla frutescens, a summer grass of great merit, and paenun palmen, a summer grass of wonderful growth and strong reproductive qualities, are both good for hay and milk cows.

Bromus inermis has succeeded upon dry, rich soils. Texas blue grass, propagated best from root stock, is stocked for high land as a winter pasture.

It must be remembered that no cultivated grasses will succeed upon poor, light soils, and that all that is required is a good grass culture. Some of the best grasses for hay are:

- Corders, cowpeas, vetches, or alfalfa, which furnish a good hay for all kinds of grazing cattle.

Of the clovers: White clover (trifolium repens) is the best of the clovers for hay. It is quite hardy, and is not injured by snow or frost, and does not require much attention.

Red clover can be grown anywhere in the state, provided the soil is not poor and the winter is not too severe. It is, however, not so certain a crop as common clover, which, when sown in the fall upon light soils, will usually give a remunerative return of hay. It is an annual, and the seed must be carefully handled and sown in the fall for the best results 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 lower bottoms 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 the land is sown. The large yellow (medicago saliva) is especially applicable to the rich alluvial bottoms of the state, or any other which sphagnum may be seeded in September or October, at the rate of fifteen pounds per acre. The land should be well drained and deeply plowed before the seed is sown. The large yellow clover, when made into hay, is a very good hay for cattle.

- Soy beans (gymnema pavi) 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 may require an indifferent rangeland stock to be successful.

- Boggar liee, or ticks (desmodrurn mole), grows well upon the best soils of the state, and when cut young gives a hay which is greatly relished by stock.

Spanish Peanuts.—This plant is now largely grown in this state. The varieties with their adherent pods are cured into hay and fed to all kinds of stock. They are also 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 (delicosa sinensis) is the "boss" crop of the southern states. It can be used as a soil restorer, a hay crop and a forage crop. There are many varieties—some bunch and some runners. When the berries are desired for food the former is preferred, if forage the latter. If improvement is desired the latter subserves our purposes. The cay, red toby, black and unknown are running varieties. The last is perhaps the best 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 is not turned into a crop of cowpeas and any rotation of crops in the south that omits the cowpea is an execrable 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. A stock of seed lasts, and at least 6 to 10 tons of dry fodder may be had at a cutting.

Next to these come jowaise (teana laxumana) which rich land gives an immense crop. Of the non-saccharine sorghums the yellow milo maize is probably to be preferred, if forage is desired, followed by white milo maize, large African millet, Kafir corn, Jerusalem corn, Egyptian corn and wheat. If seed be desired the large African millet and Kafir corn will give the best results.

Pearl millet (penicullaria specula) is used largely for soil 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 Nile 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 to refrigerators. Around New Orleans and along the Illinois Central Railroad the bulk of the vegetables and fruits for market is transported. Innumerable quantities of cabbages, onions, tomatoes, beans, peas, strawberries, Japanese plums, cantaloupes, etc., are shipped every day of the season. Cucumber and eggplants raised both under glass and in the open air are special subjects of profit, and are grown in great quantities for the market. There are many thousand acres of strawberries, which return yearly many thousands of dollars to the owners. Japanese plums and persimmons, also strawberries, are raised largely and perfectly here, and can be successfully grown everywhere in the state. The country along 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 of9414.,1.

Fruit and vegetable growing on the Vicksburg, Shreveport and Pacific Railroad, west of Monroe, and on the Texas and Pacific, above Alexandria, Neches, and Sabine, La., on the former railroads, are large truck farms, which, though recently established, promise to be very successful. From December to February, they are harvested from March 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 bushes of strawberries are frequently shipped from this state to the markets of the west and north, always with fair results. The receipts of strawberries are the chief centers of collection and shipment. Watermelons of large size and of delicious quality are raised all over the state. While marketed locally, markets, but as yet few are shipped to a distance. Apples are not grown extensively anywhere in the state. Apricots and peaches are not a popular fruit. Peaches do well in the hills of north Louisiana, and many varieties of this delicious fruit are grown throughout this section, both for home consumption and for markets.

Grapes do well also in this section as well as on the Mississippi, east Louisiana. Certain varieties, with proper to June and July, can be made to grow anywhere in the state, but the grape section is in the valley.

Strawberries are wonderfully successful in the hills and pine flats of the state, and are grown elsewhere also, but with less success. Berries are kept down the grasses and weeds through our long summers.

Blackberries and dewberries grow wild in many parts of 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 Scibold, 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, Batalon, and several others are highly esteemed.

Figs of excellent quality are grown throughout the state. In south Louisiana specifically figs are grown annually at good prices the produce of many fig orchards.

Pomegranates and olives can easily be grown in this state, and all the cultivated white peaches, indigenous to the state, are grown in extensive groves all over the entire state. Many improved varieties are tried, and the results 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 BATATAS (LII.N.) BATATAS EDULIS CHOISY.

This crop is universally grown throughout the state. It is a peculiar root, found on the table of the rich and poor alike. The state of Louisiana is credited with a crop of 5,000,000 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 the markets of the north. To the

numerative figures. As much as 1,000 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 the state experiment station at Baton Rouge and the following concluding remarks are taken from a bulletin recently published on the results of the experiments.

By far the greatest acquisition in sweet potatoes obtained so far is the Vineless. It is the 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 variety, for the necessity of daily consuming especial attention is the Providence, noted above all others for being prolific, and at the same time being well suited to our table. It still 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 Georgias, Spanish yam and the Nameans (?). For early tubers, the Vineless, Providence and Hayman offer such additional advantages that it seems in our judgment well worth giving a trial 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—denoting the possibility of the home knowledge was obtained of the character of Louisiana fruit, but so few found their way to the outside world that the latter knew nothing of their merits. The neglected, uncropped trees were frequently killed by cold, by insects or by diseases. They supplied with which the fruit under these adverse conditions, were destroyed, and encouraged a popular sentiment that oranges could not be grown successfully in Louisiana. This opinion has, however, been now almost entirely dissipated. Profitable orange groves are found all along the gulf coast in the region that used to grow.It is now a source of a large income to many
insects. Since, as oft one grove of 160 acres, planted in sweet seedlings, has brought to its owners $7,000 for the fruit on the trees. The Italians buy the fruit on the trees and then gather them and ship to market. Since 1883 a decided orange has come over on our ocean coasts.

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 lemon, the grape fruit and the citrus trifoliata all now are grown stock for stock. 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 much harder. The Satsuma, the Kewehal, Dal-Dal, 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, and perhaps, the greatest cold of any citrus fruit. This combination is now sold largely for growth in half-barrels in northern orchard nurseries. The success of 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 is given to the preparation of the soil. First—Selection of the hardiest 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, sunshades, etc. Rowles (which grow much harder than oranges) have been suggested for the accomplishment of the third object.

Cultivators, in order to be guided, will have an idea of 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 considerate importance, and the soil should be naturally or artificially relieved of any subsurface waters. Open ditches and tile drains are both used for this purpose. The latter is preferred 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 through the sweetest part of the surface. After selecting your ground have it well broken in the late summer, or early fall. If a large grove of cooperatives 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 seed or other oranges and budded on 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. Bushes of any variety at very low figures can be obtained from any reliable nurseryman. In two or three years, with proper care and skill, enough trees will be obtained to plant upon the entire grove. The first way will insure an early grove, but at greater expense. The second is slower but much cheaper, and will give the same end-result. Good one-year bushes on sour or trifoliata stock can now be bought for from $15 to $20 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 Satsuma, Tardiff, Mandarins, etc., are budded on some stock, they should be planted at least 15 feet each way. 20 feet would be ultimately better. On trifoliata, 10 to 12 feet each way will do. The sweet oranges on some stock should have from 30 to 30 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 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 market. 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, Pearson, Brown, Sweet Savile, Bristoll, Baldwin's No. 1, and many of our Creole seedlings are quite early. The tangerines, navels and some of the Blooms follow next, while Hart's Tarriff, Rivers' unknown, etc., are late bearers. It should be remembered that all oranges ripen earlier here than in Florida or California. The center experiment station at Andou- lison 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 succeed; the introduction to the grove of weeds for several years and afford several cuttings of fine hay each year. Crimson clover can annually be sown in October and may not only feed cattle, but other useful vegetables between the trees, particularly when young, and make the profits therefrom to the greatest advantage. It is to be understood that the latter bears a profitable crop. While, lastly, others prefer clean culture the entire year.

PERTHILIZATION OF GROVE.

The rich alluvial lands of the southern part of the state will grow fine, thrifty trees without fertilization. After bearing 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 branches at 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 branches are a disadvantage. The above details are given because of the conviction of the adaptability of a large amount of south Louisiana to orange groves. Many were 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 the chief locations of extensive groves are on the Mississippi river below New Orleans—In lower Vermilion, on lake Arthur and St. Martin, on Lake and Casperson along the coast, but especially on Grand Cheniere. Elsewhere orange growing has been successfully practiced by the larger industries of sugar culture, but none other than 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 the Japanese varieties. (Satsuma, Kewachai, and others). The great millions of alluvial lands in southern Louisiana might be very profitably improved as citrus groves.

The scale insects (red and purple), which are everywhere troublesome to orange growers, can be kept in subjection with success. The 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.

Randie (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 trials of machines for decorticating this plant, at the sugar experiment station, Audubon Park, New Orleans, gave promise of an early solution of the problem. The fibre from which the farmer can obtain a machine to work up the product of his soil, will not be slow in cultivating this plant, since the demand for this fiber is practically unlimited.

So, too, with jutes (corchorus capsularis and spilophora), the fiber from which is used to make grain sacks and cotton baling. 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 eastern, middle, and western Louisiana. Our soils, unaided, will supply native grasses sufficient to maintain cattle. Cattle can be raised through at least nine months in the year. The absence of grasses, clovers and forage crops which can be grown so successfully upon all of our pastures, during short winter months, make 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 leading some of our industries, sugar cane, rice, and cotton. Another sufficient reason may be the absence of packing factories, where a ready market for cattle, sheep and hogs might be found. Both of these reasons are now gradually melting away. Sugar cane and cotton no longer afford the handsome profits of the past to the sugar planter, and the latter, as a ready market for cattle, is now diversifying his crops and paying more attention to the raising of stock. A large portion 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 male raising been pursued as a professional or capital enterprise. The question of packing factories is now being discussed all over the state, and the city of Monroe has taken the lead in setting up an organization of corporate body proposing to establish such a factory. Assurances are given that this factory will be in successful operation by another year and with wire the improvement now life will be given to the farmers of north Louisiana, whose experience in stock raising justify the endeavors. As soon as this project is properly arranged, 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 parishes of southwest Louisiana and the profits were large. This industry has been destroyed by the private entry and occupancy of all these princes lands and the settlement from the northwest, who have transformed them into beautiful homes and prosperous farms. The raising of improved cattle by farmers is now the question for solution. Many are essaying it with success. Improved breeds have been introduced and tried. The best 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 the above two breeds probably is the best breed for the small farmer to grow. The Guernseys have tried to a limited extent and are quite popular. The Holsteins, short-horns and Here- reford's also have been experimented with, and upon rich alluvial lands, where "long cropping," "grazed," or "off," 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 Rhode Island, across South Carolina, Georgia, Alabama, Mississippi, Arkansas and Texas, which marks the limit of packing factories, and Louisiana and Florida are wholly in this district. All cattle brought from above this line into this district are subject to fever and must be isolated. Native cattle, raised below this line, while really healthy, carry along with them the seed of the disease and convey it to the barren and sterile land. Now that line is in contact. Hence, a national quarantine is established by the United States government against all cattle going from this section of the northward during certain months of the year. It has been definitely determined that the vehicles of transmission of this disease is the southern tick—bovine louse and that southern cattle carry them on their bodies when transported elsewhere. These ticks drop from them in the cars on the way and are caught up in the hay 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 been maintained 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 enable a national board to finance research in this most interesting and fundamental branch of sanitary science for the special study of cattle diseases. It is, therefore, in order here to caution all persons against the loss of an immense amount of 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 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. What used to be a local and neglected by-products has obtained from them. Most of the mills which feed these cattle utterly neglect one of the chief results of feeding, viz: the finding and saving of the drippings of the cattle, which, to the small farmer, would be of great value. Hence the expedience 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 fenc ing them byの大ばに見込みの経済的に適応年間で、winter, carefully husbanding the manure and applying to his soil, and selling the cattle as fat beaues in early spring. This will have no doubt furnish the manure for his fields and save the amount now expended in the annual purchase of commercial fertilizers. Another 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. Monroe Maxwell will prove.

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, 1853.

Dr. W. H. Dalrymple, Batoa Rouge, La.: My Dear Sir—Complying with your request of the 3rd 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 past ten years, and 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 advise my friends to farm and get the 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 $2.50 and the latter at $2.22 per ton delivered. The above was 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 43 day the cattle were delivered to the buyers 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 the former crops 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 do so better and cheaper than farmers in the northwest. They have advantages in climate and soil, and can raise many things that cannot be grown 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. I have at one time or another fed two pairs of cows, two pairs of calves, two pairs of cows, two pairs of calves; advised 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 team 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.

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 and horses should have our climate, and thousands are bought annually by our sugar and cotton planters from the western farmers. They can more easily adapt themselves to our climate. From the number of jack mules 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 is in larger request and are chiefly grown.

SHEEP RAISING.

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 Dorset breeds 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 was so patient waits 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 at once 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 ripen

HOG RAISING, stock it is possible to rear 14 to 16 pigs 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 andfatten 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 Bushel Cotton stations in Poland,
China, have proven excellent peddors 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
disordered soils may be restored to
more than virgin fertility, if proper
rotation with fertilization be adopted.

An exclusive cotton culture
much of the lands of north and middle
and east Louisiana have become so
deprecated of their original fertility as to
fail to give remunerative returns for the
labor of cultivation. The question of
importance to every patriotic citizen
of Louisiana is how to restore these
worn and tired soils. It is of vital in-
terest 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 ac-
complishment. The following advices
have been advertised for a crop of
cotton with and without fertilizers,
beginning. The crops selected were oats, cowpeas,
cotton, corn and cowpeas, or five crops in
three years. This plan would afford
sufficient evidence 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 recommended 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 plots of two
acres 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, oth-
erwise the plots are treated alike. The
rotation began with oats in plot No. 1
(front acre fertilized and the rear acre not)
front acre fertilized, rear acre not).
Plot No. 2 (front acre fertilized, rear acre not).
The oats were removed in May or
June, and sown at once in cowpeas, using for front acre a mixture of
90 pounds acid phosphate and 50
pounds potassium broadcasted and harrowed in. Each plot was
seeded in the circle one step each year.
This year we complete the second round
of the rotation. At Baton Rouge defensive
drainage has been practiced some years
which 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 1890 was 4.14
bushels, 8.23 bushels in 1891, 25.5 bushels
in 1890, 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
13.49, 20.6, 16.6 and 6.1 bushels, a
total of 56.8 bushels, or an average of
11.90 bushels per year. The cotton yields
were 528, 492, 331 and 560 pounds
of seed cotton, a total of 2468 pounds,
or an average of 93.6 pounds per year.

The fertilized plots gave for oats 12,
21.5, 55.2, 41.8 and 40 bushels, a total of
170.5. 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 unfertilized cotton gave 529, 706, 1719,
1558 and 1414 pounds seed cotton, a total of
6230 pounds, or an average of 1525 pounds per year.

In the five years’ trial two seasons
have been very dry and yields accord-
ingly depressed. It is, however,
worthy of note that the unfertilized plots have
suffered the worst droughts. The
aggregate yields of the unfertilized plots have been 86.92 bushels of oats, 59.49
bushels of corn, and 560 pounds
of seed cotton per acre. The total
yields of the fertilized plots have been 175.5 bushels oats, 121.23 bushels corn, and 6230 pounds
of seed cotton per acre. The excess of fertilizer over the unfertilized plots
have been 85.58 bushels oats, 61.74
bushels corn, and 5522 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 $41 50.

Estimating the oats at 29 and the corn at
$1.50 per bushel, the cotton at 2.12 cents per pound, the increase
due to the fertilizers would be $135 84.

Deducting cost of fertilizers there would remain
$280 16 as profit per acre. The use of fertilizers for five years on three
acres, or $8 20 per acre each year.

This is an excellent showmg and renderss cer-
tain this plan of rotation with fertilizers
as which will build up the hill lands of north Louisiana, and at the same time
leave a bardsome 263 pounds seed cotton
for the labor applied. The results from the rota-
tion without fertilizers are not satisfac-
tory, but shows that upon poor lands the proceedings on the rotation and
rotation is slow and gradual. With fertilizers under
each crop the process is rapid and profit-
able. An Inspection of the table given
will show that the oats increase, corn,
properly seeded in October, is a more
reliable crop in north Louisiana than
corn. This will doubtless remain true
until the time comes when a soil with
vegetable matter sufficient to enable the
corn crop to withstand the droughts
which occur at long frequent intervals in the spring and summer.

The following, taken from a pamphlet on
Louisiana recently published by the
state agricultural commissioner, Col-
nel J. G. Hawks, gives the names and
chief stations of all
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 Oyoka.

It passes through five parishes of this state, the stations being New Orleans; Saucy and Kenner, Jefferson parish; Franklin and Michae, St. John's parish; Ponchatoula, La., and Ponchatoula, Hammond, Tickfaw, Independence, Amite City, Arcota, 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; Sarpy, St. Charles parish; St. Peters and Bonnet Carre, St. John parish; Angelina, and Convent, St. James parish; Burside, 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 Railroad passes through two parishes.

The important stations are New Orleans; and Slidell 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 Rapides parish; Gordon, Monroe. Chetite and Calhoun, in Ouachita parish; Choudrant, Ruston, Allen Greene and Simsboro, in Lincoln parish; New Orleans, New Orleans, Tallyors and Bienville, in Bienville parish; Homer, in Claiborne parish; Dubberly, Sibley, Doyle and Minden, in Webster parish; Houghton and Dodge, 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 Waskoma 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 six parishes, and principal stations are New Orleans, Gonzales, Gretna and Jefferson parish; Davis St. Charles and Dugan, St. Charles parish; St. John and Johnson, St. John parish; Vacherie, Delcambre, St. James and Winchester, St. James parish; Donaldsonville and McCall's, 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, Fordoche and Ravenwood, Pointe Coupee parish; Melville, Independence, and St. Landry parish; Bunkie, Avoyelles parish; Cheneyville, Lecompte, Lamonrie, Moreland, Alexandria, Rapides, Boyce and in Rapides parish; Caddo, Alexandria, Cypress, Providence, Robeline and Martha Ville, Natchitoches parish; Sodus, Sabine parish; Oxford, Mansfield, Grand Cane, Cave Hill and Shreveport, 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 in New Iberia, Texas and Galveston, and from Crowley to Eunice, in St. Landry parish.

The Southern Pacific passes through thirty-three 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, Murray and Jefferson, in Jefferson parish; Boutte and des Allemands, St. Charles parish; Raceland, Ewings, Bousbeaux, St. James parish; Lafourche, Houma, Chacahoula and Tigerville, Terrebonne parish; Gibson and Boening, Assumption parish; Ramsay, Morgan City, Raymond, Pascherehoch, Bayou Sale, Franklin, Baldwin, Glencoe, Cypremort and Sorrel, St. Mary parish; Jeanerette, Olivier, New Iberia, Petit Anse, Segura and Burke, Iberia parish; Cades, St. Martinville and Breaux’s Bridge, St. Martin parish; Ducharmant, Broussard, Lafayette, Scott, and Mare Island in Lafayette parish; Dubuque, Rayne, Crowley, Estherwood and Meredith, Acadia parish; Jennings, Evangeline, Welch, Lacassine, Iowa, Chene Gue and Eunice, in Vermilion parish; W. F. Dick Moore, Sulphur Mine, Edgerly, Vinton, Sabine, Jacksonson and Echo, Calcasieu parish; Grand Coteau, Bellevue, Opelousas, Washington, Beggis, Garland, Whiteville and Barbeck, St. Landry parish; Milburn, Avoyelles parish, and Eola, Hansville 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, and 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, Vilderongue, Forest Hill and Glennmore, in Rapides parish; Oakdale, Oberlin, Kinder, Benton, Iowa, Bon Air, Alexandria, La Chapelle, St. Landry parish, and Grand Lake and Watkins, in Cameron parish.

The Houston, Central Arkansas and Natchez Railroad. This road extends from Alexandria, in a northeasterly direction, and enters the state of Arkansas in the northeastern portion of Morehouse. It passes through six parishes, and its most important stations are: Alexandria, in Rapides parish; Pollock and Dugdalemon, Grant parish; Tullos and Olla, Catahoula parish; Kelly, Grayson, Bridges, Columbia, Riverton and Eureka, Calhoun parish; Caplin, Monroe and Sicard, Ouachita parish, and Collins, Doss, Mer Rouge, Gallion, Bonita and Jones, in Morehouse parish.

The New Orleans and Southern Railway.—This line extends northward from Shreveport, and enters the state of Arkansas at the post office of Longstreet, in Desoto parish. It passes through two parishes and the principal stations are Shreveport, Larosse and Keithville, in Caddo parish, and Provencal, in Concordia parish.

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

The most important stations are Vidalia, Concordia, Provencal and Tensas, in Concordia parish; Green ville, Wildwood, Florence and Pecks, in Catahoula parish; Bryan, Gilbert and Winemoura, in Franklin parish; Archibald and Caddo parish, in Richland parish, and Collins, in Morehouse parish.

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; 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; Ver sailles, Arabi, Poydras, St. Bernard, Tchefuncte, North Umpaggio, Florissant and Shell Beach in St. Bernard parish, and English Turn, St. Clair, Stella, Mary, Greenwood, Mounceville, Sordelet, Nero, Pointe a la Hache and Bohemia, in Plaquemines parish.

The New Orleans, Fort Jackson and Grand Isle Railroad.—This line extends down along the eastern part of the Mississippi river through two parishes. The principal stations being Aiglers, in Orleans parish, and For Leon, Concordia parish, Arnette Grove, Wood Park and Grand Isle.

The City and Lake Railroad extends to Spanish Fort and the Pontchartrain Railroad terminus, and is a pleasure resort on lake Pontchartrain.

The track-laying during the year 1893 in the state was on five lines and amounted to 2030 miles of road.
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 penetrate 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

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<th>Names of Waters</th>
<th>Miles of Navigation</th>
<th>Head of Navigation</th>
<th>Navigable in the Parishes of</th>
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<td>Barnarias bayou</td>
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<td>Black river</td>
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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.
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 unequaled 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 the larger cities. 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 one bayas 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 centre 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 least remunerative—fields for the employment of capital and intelligent labor. Prominent, if not the principal, among these neglected lines, are the vast fishery treasures 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 capital and labor so cheap, and so little labor and capital are required for its development, that its wonderful advantages and enormous profits once known, capital and labor would hasten to 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, part of 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 form part of the state like New Jersey, 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 banks under proper care developed into an oyster which for the delicacy of its flavor cannot be excelled in the world, except by the Schlesispiit 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 pounds of oysters, so called, from Mississippi, carry away annually hundreds of schooners loads of the shell fish.

The Bayous of these bivalves here taken, although of excellent and fine 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, Thibodaux bay, Bay island, Barataria bay, Vine island lake, Vermillion bay and the Calcasieu grounds furnish the best, those of Bayou Cook having the highest reputation in the markets of Louisiana and the neighboring states, and bringing a correspondingly high price.

The difficulties, dangers and delays of transportation are being rapidly overcome by railways and canals, some of them built, and others projected, penetrating the best oyster regions, and if capital be properly encouraged and protected it
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 catesbaei, turkey oak; quercus cinerea, sand jack oak; quercus falcata, Spanish oak; quercus f从严治党, overcup oak; quercus michauxii, cow oak; quercus nigra, black jack oak; quercus obtusa, post oak; quercus palustris, pin oak; quercus phellos, willow oak; quercus punicea, swamp chestnut oak; quercus incana, red 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 ovata, pecan.

**Ash**—Fraxinus Americana, American ash; fraxinus platycarpa, water ash; fraxinus veridis, green ash.

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

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

**Maple**—Glaucia, sweet bay; grandiflora, magnolia macrophylla, cucumber tree.

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

**Maple**—Acer griseum, hard maple; acer rubrum, red maple; acer saccharinum, sugar maple.

**Pecan**—Pecan Americana, American pecan; angustifolia, Chickasaw plum; serrulata, wild cherry.

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

**Witchhobble**—Hibiscus incanum, marshmallow; hibiscus moschatus, marshmallow.

**Sumac**—Rhus glabra, sumach; rhus concoliana, sumach.

**Haw**—Viburnum, medium haw; viburnum, pinodoceum, black haw; viburnum scabrel- lum, haw.

The following trees are mentioned in the text:

- Elms
- Willows
- Maples
- Oaks
- Pines
- Sumac
- Hibiscus
- Viburnum
- Aesculus
- Ulmus
- Quercus
- Nyssa
- Acer
- Pecan
- Viburnum

Other trees—Ostuja Virginica, Ironwood; cornus flava, dogwood; sassafras officinalis, sassafras; dioxyrys Virginiana, persimmon; asimila parviflora, pawpaw; gleditschia triacanthus, honey locust; gleditschia monosperma, water locust; hamamelis Virginica, witch hazel; oxycotinus ornus, witch hazel; Fraxinus americana, wax myrtle; alnus serrata, alder; casanea pumila, chinquapin; juniperus Virginiana, red cedar; fagus fer- ruginea, beech; tilia Americana, linden tree; carpinus Americana, hornbeam; flex opaca, holly; enonymus Americanus, burning bush; lenodendron tulipifera, tulp, or poplar; crapeagus apifolia, hawthorn; sambucus Canadensis, alder; chromaustus Virginica, fringe tree; morus rubra, mulberry; madura aurantia, Osage orange; beta rubra, red birch; populus hel- rophylla, cottonwood; salix —, willow (many species); catalpa bignoldes, catalpa; platarius occidentales, sycamore; ne- gundo aceroides, box elder; celtis occidentales, hackberry; taxodium distichum, cypress; jugiassa nigra, black walnut; xanthoxylum clara, 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 re- cently invested in these timber resources, and the timber mill profits of the south, 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 for- mer, of the latter we stand without a rival, in both the immense quantity avail-
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 more opportunities for all manufactories of wood than here in Louisiana. Factories for wagons and carriages, lumberware, barrois, 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, 1890, viz:

- **Long Leaf.**
  - Short Leaf, Feet. 117,119,000,000
  - Long Leaf, Feet. 121,904,400,000

**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 organized 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, New Orleans, 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 research. 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, is 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 Methodist have a college for young men at
Jackson. The Catholics have made college at Mansfield, and the Baptist at Keatchie and the Masons at Fort Jessup.

Monroe, Lake Charles, Liberia, and other towns maintain excellent graded schools.

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

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

Theological seminaries exist in St. James, Baton Rouge, Alexandria, Shreveport, Opelousas and Monroe. There are also, in Rice University, which is credited for both boys and girls in New Orleans.

Clinton has a flourishing female college (the Simmons Institute) and a fine military academy. Shreveport also has a flourishing female college and military academy, besides an excellent system of graded public schools. In 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, Liberia, and other towns maintain excellent graded schools.

Tulane University, situated in New Orleans, established by the munificence of Paul Tulane, has recently turned out a handsome style all of its colleges. Its colleges of arts and science, letters, engineering, law and medicine are numerously attended and highly regarded. In 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 academies supported by private or missionary contributions, which are well managed and attended.

**HEALTH OF LOUISIANA.**

The erroneous impression prevails throughout the country that Louisiana is a low-lying swamp, full of deadly malaria, the impecunious 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 more about Louisiana than a 12-year-old pupil in the public schools of the country. In the compilation of the eleventh census, 1880, part 1. population, Robert R. Porter, superintendent, page 58, a description of the alluvial region of the Mississippi 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 far the larger proportion of the inhabitants is of the colored race." This fact!!! is announced in several other places in the same volume, with the noonday, the noonday 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 52 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, lusty 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 a 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 disease; nor have a single one been forced to leave this fertile country because "the climate is 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 17.20 for the blacks.

For the white, Oregon is first, with a mortality of 11.04 per 1000, while Minnesota, an excellent second at 11.51 and Arkansas brings up the foot of the list with a mortality of 14.11, 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, laying a rate of mortality in that state of 11.30 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 undeniably 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, 15.85; 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 7.32. Mississippi 7.90. 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, 21.40; California, 25.31; New York, 25.38; Connecticut, 26.75; Massachusetts, 20.21; Ohio, 33.36; Rhode Island, 33.43; Oregon, 33.49; New Jersey, 35.22; Wisconsin, 35.01; Pennsylvania, 36.15; and then Louisiana, with 35.05, 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 4.62; Texas second, with .60 per cent; Nebraska third, with .35; Kansas fourth, with .75; Florida fifth, with .13; Oregon twentieth, with 12.12 per cent; California thirty-third, with .15, and Maine the very last, with .10 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 the 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
ITS ADVANTAGES! ITS CONDITIONS! ITS PROSPECTS!

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 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, 228 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 mails, 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 buildings, 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 manufactories 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, Iberville, Opelousas, Natchitoches, Donaldsonville, Plaquemine, Lafayette, Franklin and Thibodaux are all towns of 2000 inhabitants and have aspirations for fuller development and larger importance. Each have one to three banks, several manufactories and are centers of trade.
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 at Natchitoches for north Louisiana.

Second—State lands, of which there are 3,423,190 acres. Full information in regard to these can be given by Major Jno. N. Later, 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 English Syndicate, Dr. S. A. Knapp, president, Lake Charles.
- 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.
- Curtis & Walmsley, New Orleans.

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. P. Merry, assistant passenger agent Illinois Central Railroad, Manchester, Iowa.
- Mr. E. Hawley, assistant general traffic agent Southern Pacific Company, 343 Broadway, New York.
STATE OF LOUISIANA,
State Land Office,
Baton Rouge, Nov. 23, 1883.
Commissioner of Immigration, New Orleans, La.:—Dear Sir:—I have no letter of the 21st inst., I have to inform you that the within copy of act is still in the possession of the law, and that the laws do not apply to all at homesteaders, that the governing law as to these is act. No. 61, of the session of 1888, which you will find on page 76 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 enclosed copy of act 57 of 1880 refers entirely to purchasers of state lands. The public lands donated by the public lands sold this year was not made because they were not fit for settlement and culture; hence there are few home-stead entries made at this office, and the United States land office in your city.

Very respectfully,

JOHN S. LANIER, Registrar.
The Newspapers of Louisiana.

No 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; 3 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 State 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'Abéille (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.