ECONOMIC DEVELOPMENT OF THE
GULF COASTAL PRAIRIE

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GULF COASTAL PRAIRIE

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CHAPTER I

PHYSICAL ASPECTS

The study of the economic development of the Gulf Coastal Prairie has been divided into the following seven chapters: (1) Physical Aspects, (2) Grazing, (3) Development of Farming, (4) Development of Transportation, (5) Development of Mineral Resources, (6) Development of Industry and (7) A Look to the Future.

The region chosen for this study comprises a geographic area which is characterized by its natural vegetation. The map on page two, which pictures the boundaries of the Gulf Coastal Prairie, is derived from the natural vegetation map, number 14 of the Texas Series, edited by L. W. Newton and published by Denoyer-Geppert Company of Chicago. This area corresponds in a general way with that portrayed in the native plant life map on page 189 of the Texas Almanac 1949-1950.

In each chapter of this study except that of Physical Aspects and A Look to the Future an effort has been made to trace the development of that industry from its inception to the present.
Gulf Coastal Prairie
Scale 28 miles to the inch
In order to better understand the economic development of the Gulf Coastal Prairie some understanding of the physical aspects of the region is deemed necessary.

The Gulf Coastal Prairie is an elongated area lying adjacent to the Gulf of Mexico which stretches from the Sabine River on the northeast to the San Antonio River on the southwest. To trace the boundaries of the area one may begin in San Antonio Bay at the mouth of the Guadalupe River, following that river to the mouth of the San Antonio River. From this point the boundary follows the San Antonio River until it intersects the eastern boundary of Goliad County, thence north along said boundary to the northeastern most part of the county. Turning northeast the boundary of the Gulf Coastal Prairie then follows, in a rather erratic fashion, the northwestern boundaries of Victoria, Jackson, Wharton and Fort Bend Counties, until it reaches the Brazos River. From here the boundary runs to the northwest along the course of the river. At a point a few miles south of Hempstead the boundary leaves the Brazos and stretches to the east, southeast, then east again, to pass through the center of Harris County, on the north of Houston, and cross the San Jacinto River just north of where it forms a juncture with Buffalo Bayou. Thence the boundary continues in an east-north-east direction along the northern boundary of Chambers County, through northwestern Jefferson County and across Orange
County to a point on the Sabine River a short distance north of the city of Orange. From here south to the Gulf of Mexico the Sabine River and Lake Sabine mark the boundary. The southeastern margin of the Gulf Coastal Prairie is formed by the Gulf of Mexico.

A much briefer description of the boundaries is given by the Texas Almanac 1949-1950: "The Coastal Prairies of Texas extend inland from tidewater for a distance of fifty to eighty miles . . . from the Sabine to the Rio Grande Embayment."¹ W. T. Chambers defines the area as including "the eastern and central parts of the Texas coast."²

The Gulf Coastal Prairie is a wide strip of low, almost perfectly level land. Along the coast the surface is but a few feet above sea level. From the Gulf inland, to the north, it rises very gradually and uniformly to elevations of some 100 feet or more above sea-level. The surface is very smooth and generally flat, though near the inland margins of the region it is undulating. "Many areas are so flat, or even slightly depressed, as to allow water to stand for a long time."³ This is due in part to the dense clay soils which do not allow fast penetration of the water. The

¹Texas Almanac 1949-1950, p. 156.
general slope of the land is from the northwest to the south-east.

In area the Gulf Coastal Prairie covers approximately 11,400 square miles, or 7,300,000 acres which lie within, or partly within, sixteen counties.\(^4\) For the purpose of this study only those counties which have a considerable part of their area within the boundaries of this region are considered. They are: Brazoria, Calhoun, Chambers, Fort Bend, Galveston, Harris, Jackson, Jefferson, Matagorda, Orange, Victoria, Waller and Wharton.

This is a prairie region and the most important vegetation is the grasses which in their native state covered all of the region except along the streams and on alluvial lands. Marsh and salt grasses are to be found in the area immediately adjacent to the coast. Inland, on the better drained areas, are to be found the numerous species of coarse prairie grasses which are largely "Andropogon, Faspalum, Panicum and others."\(^5\) Some grama grasses are to be found in the western portions of the prairie.

The first Anglo-American settlers to this region found the alluvial bottom lands "covered with cane, wild peach, haw, persimmon, mulberry, hackberry, pecan, walnut, ash, cypress, cedar, cottonwood, box elder, sumach, liveoak, Spanish


\(^5\)Carter, op. cit., p. 11.
water oak, post oak and overcap oak.\(^6\) Salt cedar is abundant on the sandy land along the shore while cypress and pine grow in the northwestern part of the region. Pecans flourish on the well drained bottom lands in the southwestern section and there are numerous motts of live oak.

The climate of the Gulf Coastal Prairie is mild and subtropical. Because of its location along the Gulf it benefits more from the prevailing southeastern winds than do the more inland areas of the state, and there is less variation in seasons. In the late fall and winter months "northers" bring chilling winds on the average of about once a week. Although a few killing frosts are expected the winters are short, and the moderating influence of the Gulf makes them rather mild and enjoyable to the inhabitants. The summers are long and hot and would be much hotter except for the breezes from the Gulf.\(^7\)

The average annual temperature is very nearly the same throughout the area and does not vary more than two degrees. Computation based on figures from the thirteen counties in the region shows the annual mean temperature to be \(69.1^\circ\), while the January average is \(54.4^\circ\) compared to a July average of \(83.2^\circ\). (See Table 1)

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\(^6\) M. S. Helm, *Scraps of Early Texas History*, p. 137.

\(^7\) Carter, *op. cit.*, p. 22.
There is a greater variation in rainfall with as much as 53.66 inches in Jefferson County to as little as 35.60 inches in Victoria County. The annual average for the Gulf Coastal Prairie, based on figures given in Table 1, is 45.0 inches. A study of monthly rainfall tables\(^8\) shows that rainfall is well distributed throughout the year with heaviest precipitation occurring during the months of May through September.

There are four soil groups in the Gulf Coastal Prairie with each having many different characteristics. On the basis of the main soil characteristics they are divided as follows: "(1) Dark-colored prairie soils; (2) Light-colored prairie soils; (3) Marshy and semi-marshy soils; and (4) Alluvial soils."\(^9\)

The dark-colored prairie soils cover the largest portion of the land in this region as well as being the most productive. They occupy more than three million acres of land and produce such crops as "rice . . ., cotton . . ., figs, various feed crops, and in places, considerable truck crops. . .\(^{10}\). It is this soil which is most highly esteemed for rice because of its characteristic slow drainage and high moisture content. Much of the land in this soil group is still in its virgin

\(^8\) Texas Almanac 1949-1950, pp. 171-75.
\(^9\) Carter, op. cit., p. 23.
\(^{10}\) Ibid., p. 25.
state, being used for range land, because it is located in areas where there is inadequate drainage.

Second in extent are the light-colored soils which occupy a total area of "nearly 2,750,000 acres."\(^{11}\) They form a belt along the interior margin of the region adjacent to the post oak and pine wood timberlands of East Texas. Only a small percentage of these sandy textured soils have been turned by the plow. Pine, oak and gum growth are found on a part of this land while most of it is turned to grazing. Crops grown with moderate success in some areas are cotton, corn, rice, berries and truck crops.

The marshy and semi-marshy soils, comprising some 750,000 acres, "occupy strips of lowland adjacent to the waters of the Gulf. . . . The surface is very flat and lies but slightly above sea-level and in places some is at times covered with salt water blown from the Gulf during storms."\(^{12}\) The vegetation consists of salt cedar and other salt and water-tolerant plants. These soils are not suited to crops but are used for grazing as vegetation allows.

The alluvial soils consist of soils washed from other regions and deposited in the Gulf Coastal Prairie by its sluggish streams. These soil deposits, lying along stream courses, are forested with hardwoods. Although subject to overflow, "They are well suited to cotton, corn, sugar cane,

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feed crops, alfalfa, pecans and some truck crops." The extent of these soils is approximated at 750,000 acres.

It should be noted that the region has large areas of soils which within themselves are well suited to the cultivation of many different crops, but that the extent of their use depends largely upon adequate drainage. Rice is the only crop irrigated, but the canals could be used for irrigation of other crops should the need arise. Conservation programs to conserve and build up the fertility of the soils are being carried out on an increasing scale.

The water resources of the Gulf Coastal Prairie, as compared with other regions, are plentiful. A majority of the main rivers of Texas either cross or bound the region. The largest of these rivers are the Sabine, Neches, Trinity, Brazos, Colorado, Guadalupe and San Antonio. Other streams, some of which have proved of the utmost importance to the economic development of this region are the San Jacinto, San Bernard and Lavaca Rivers and Buffalo Bayou. In addition there are numerous bayous and creeks which flow into the above mentioned streams or directly into the Gulf. These streams drain all of the 11,400 square miles of the Gulf Coastal Prairie and a vast interior region. Computations based on figures given in the Texas Almanac 1949-1950 show that streams flowing through this region drain about 59 per

cent of the total land area of Texas, or about 157,000 square miles.\textsuperscript{14}

This factor points to the importance of the development and control of these rivers to the Gulf Coastal Prairie. Rains in the interior of Texas may bring devastating floods to the region. Silt washed down stream and deposited in the river channels and near the mouths of the rivers hinders navigation and is destructive to certain forms of sea life such as oysters. Inasmuch as control of floods and regulated flow of water along the rivers of the region are dependent upon water and soil conservation programs from source to mouth, the development of the basin of each river is briefly considered.

When discovered the banks of the Sabine River were covered with cypress trees which caused the explorers to name the river "Sabine," meaning "cypress."\textsuperscript{15} This stream has its source in the hill regions of Hunt County and flows into Sabine Lake. The lower course of the Sabine forms the boundary line between Texas and Louisiana and because of its interstate character dam construction along that portion of its course has been hindered. The fifty-first legislature set up a new Sabine River Authority to work in cooperation with Louisiana to speed development. Reservoirs have been


\textsuperscript{15}F. M. Hughes, \textit{Legends of Texas Rivers,} p. 71.
constructed on the part of the river which lies wholly within Texas. Among these is the 62,500 acre-foot capacity Cherokee Lake completed in Gregg and Rusk Counties during 1949.16

The Neches River heads in Van Zandt County and follows a southeast course to Sabine Lake. In 1949 the construction of four reservoirs on the head waters of this stream had been authorized. One of these was a dam at Rockland, in Tyler County, to impound water which would be flowed by gravity to the Beaumont area for irrigation and industrial purposes.17

Both the Sabine and Neches Rivers have played a very important role in the development of this region. It was here that commercial irrigation of rice had its birth. Rice irrigation companies get their water almost exclusively from the rivers, and in recent years Beaumont, Orange and Port Arthur have come to look to these streams for an additional industrial water supply. A problem that has accompanied the use of these waters is indicated by the following:

The public water supplies of Beaumont and Port Arthur have been noticeably affected during periods of low flow in the Sabine and Neches Rivers, and it has been necessary to install temporary dams across the main stream to prevent salt and sewage pollution from receding back far enough to affect seriously these supplies.18

17"Development of Texas Rivers," (Prepared by The Texas Planning Board, Austin, 1938) p. 11. (Mimeographed).
18Ibid., p. 6.
The largest of the streams which empty into Galveston Bay is the Trinity River whose tributaries reach almost to the Red River in north central Texas. The average annual stream flow near its mouth is 5,000,000 acre feet, but its flow through the year is irregular.\textsuperscript{19} Within recent years considerable development of the watershed on the upper branches of the river has taken place. There are no reservoirs on the river within the Gulf Coastal Prairie. The nearest thing to it is a strongly backed proposal to build a dam about ten miles north of the town of Liberty in Liberty County.\textsuperscript{20} Working toward the development of the Trinity River basin are the Trinity Watershed Soil and Conservation and Flood Control District; the Trinity River Canal and Conservation District; the Harris County Flood Control District; and the San Jacinto River Conservation and Reclamation District.

The Brazos, which is the largest of Texas Rivers, head at Lake Abilene in Young County and traces a course of 900 miles to discharge its waters into the Gulf of Mexico near Freeport in Brazoria County. Two outstanding efforts made to control flood waters on this river were the building of Possum-Kingdom and Whitney dams, the one in Palo Pinto County and the other on the Hill-Bosque County line. There are no

\textsuperscript{19}Ibid., p. 22.

\textsuperscript{20}The Dallas Morning News, June 23, 1951, Section 1, p. 3.
reservoirs on the Brazos River below Waco although the Texas Planning Board for the development of Texas rivers has recommended the construction of several. "Some of the reservoirs can be designed, constructed, and operated to generate electrical energy and provide irrigation water in the coastal region during periods of low flow."\textsuperscript{21}

The Colorado River is like the Brazos in that it, too, flows some 900 miles from its source near the New Mexico boundary to Matagorda Bay. "The name, Rio Colorado, meaning red stream, is a misnomer, as its waters are clear and sparkling and have been, according to the earliest records of historians."\textsuperscript{22} There has been some contention that in some way the names of the Colorado and Brazos were interchanged.

Development of the basin of the Colorado to conserve soil and water and to furnish electrical energy has progressed farther than that of any other district. Most of the work has been done above Austin by the Lower Colorado River Authority. Use of river water for irrigation on the Colorado came about as the result of a raft, which blocked the river some ten miles above its mouth. The raft, which was there when the Anglo-Americans began to settle Texas, defied their attempts to destroy it. Efforts to do so were suspended and for more than fifty years it was allowed to

\textsuperscript{21}"Development of Texas Rivers," \textit{op. cit.}, p. 52.

\textsuperscript{22}Hughes, \textit{op. cit.}, p. 35.
grow, forming a dam, and holding the water which the rice
growers made use of to irrigate their crops. \(^{23}\) Eventually
the raft was destroyed. Nonetheless, by 1943 an estimated
85,000 acres of rice in the lower Colorado River valley were
irrigated primarily with river water. \(^{24}\)

The Guadalupe River flows 255 miles from Kerr County,
via Victoria, into San Antonio Bay. "It has a steadier flow
and carries more water to the sea than any other Texas riv-
er." \(^{25}\) Stephen Austin, in describing the water resources of
Texas reported that the Guadalupe afforded a great many situ-
ations for waterfalls. \(^{26}\) This characteristic has been ex-
plotted by the building of a number of hydroelectric plants
in DeWitt and Gonzales Counties. Recent years has also seen
the use of the water of this river for irrigation purposes.
In 1943 it was determined that "an estimated 50,000 acres of
rice could be developed in Victoria and Calhoun Counties by
installing pumping equipment and canals to utilize water from
the Guadalupe River." \(^{27}\)

\(^{23}\) Ibid., p. 75.

\(^{24}\) F. B. Plummer, "Water Resources," Texas Looks Ahead, I
The Resources of Texas, edited by Lorena Drummond, 251.

\(^{25}\) "The History of the Guadalupe River," A leaflet pre-
pared by the Victoria Chamber of Commerce.

\(^{26}\) Hughes, op. cit., p. 14.

\(^{27}\) A. C. Magee, Information Basic to Adjustments in Rice
Production in Texas, p. 8.
The spring-fed San Antonio River forms a part of the southwestern boundary of the Gulf Coastal Prairie before it joins the Guadalupe to empty into San Antonio Bay. It too, offers a potential increase in water for irrigation.

Other than rivers there are few natural bodies of fresh water in the Gulf Coastal Prairie. Green Lake, situated in Calhoun County about five miles from San Antonio Bay, is the only one of any consequence and is reputed to be the largest natural body of fresh water in the state. The lake covers an area of about 10,000 acres. 28

There are few man-made lakes in the Gulf Coastal Prairie. The abundant water resources of the region did not, in years prior to about 1940, make their building necessary as a source of water while the surface characteristics of the land did not make their building for generation of hydro-electric power feasible. Industrial development in this region in recent years has begun to change the picture. A few reservoirs have been built and others are being considered.

Wharton and Galveston are the only counties in the Gulf Coastal Prairie other than Harris which have large reservoirs. Near the San Bernard River in Wharton County is a lake of 2,150 acre-feet capacity which is owned by the Texas Gulf

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28"Inventory of the County Archives of Texas, No. 29, Calhoun County," (Prepared by the Texas Historical Records Survey, 1941), p. 1. (Mimeographed.)
Sulphur Company. In 1949 Texas City completed a 2,700,000,000 gallon reservoir which obtains its water from the Brazos River by means of a series of canals with gravity flow. The reservoir has an inlet capacity of 250,000,000 gallons per day.

Harris County reservoirs include Addicks and Barker Lakes on Buffalo Bayou and tributary. Completed during 1947-1948 they have a capacity of 188,000 and 135,000 acre-feet respectively. They were built primarily for flood control. There are three other lakes in the county with their waters being used for municipal supply and irrigation. Houston now has a $22,000,000 construction project under way on the San Jacinto River above the city, which will make available "150 million gallons of surface water per day."

Of no less importance than the surface waters are the ground waters of the Gulf Coastal Prairie. The three formations found in this region are the Goliad-Willis-Lissie group, the Beaumont clay, and the Alluvial and Bolson deposits. It is from these formations that the municipalities of the region have for many years derived their water supply.

29 Texas Almanac 1949-1950, p. 188.
30 "Texas City, Texas," Information leaflet prepared by the Texas City Chamber of Commerce, February 26, 1951.
31 "Houston," Information folder prepared by Houston Chamber of Commerce.
The Goliad-Willis-Lissie formations are the most important and it is from this source that Houston gets most of its water by means of some thirty-nine wells.\textsuperscript{33} As of 1938 Houston was the largest city in the United States that used ground water exclusively.\textsuperscript{34} Beaumont, Galveston, Texas City, Port Arthur and Orange, as well as other smaller cities and towns, get their water supply from the Beaumont Clay. The industrial growth of several of these cities within the last decade have caused some of them to make attempts to obtain supplemental supplies of surface waters, as previously indicated.

Ground waters have also played an important role in irrigation. The first extensive use of ground water for irrigation in the state came in the rice lands of the Gulf coast south of Houston.\textsuperscript{35}

Table 1, which was compiled from information in various sections of the \textit{Texas Almanac 1949-1950}, shows average annual rainfall, average annual growing season, mean January temperature, mean July temperature, and annual mean temperature of the counties of the Gulf Coastal Prairie.

\textsuperscript{33}“Houston," \textit{op. cit.}

\textsuperscript{34}“Development of Texas Rivers," \textit{op. cit.}, p. 235.

\textsuperscript{35}Plummer, \textit{op. cit.}, p. 235.
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CHAPTER II

GRAZING

Recorded history gives basis to the belief that grazing is the oldest land use industry in the world, as well as the most important upon the basis of percentage of land area devoted to it. Likewise grazing is the most important land use in Texas and the Gulf Coastal Prairie. It has been one of the most important factors in the economic development of this region. In determining the origin of the industry it is necessary to look to the Spanish settlement of Mexico.

The animals associated with the grazing industry in this country are primarily cattle, sheep, goats and horses. The Spanish peoples are to be given the credit for introducing them to Mexico, Texas and many other parts of the "new world." Grazing was an important industry in sixteenth century Spain, and the Spaniard undoubtedly brought with him a liking of this way of life. Necessity, too, prompted him in bringing animals to the Americas. The conquering armies had to have food. In order to have fresh meat it was necessary to drive the cattle, sheep, goats and swine along on the hoof and kill them as needed. Horses and mules were used to carry other supplies as well as to ride.
Cattle were brought to Mexico as early as 1521 by one Gregorio Villalobos.\textsuperscript{1} That they and other livestock had increased rapidly in numbers by 1540 is indicated by this statement concerning the Coronado expedition:

Coronado seems to have had no trouble in gathering at least 500 head of cattle, besides thousands of sheep, goats, and hogs to supply food for this great expedition in search of the golden Seven Cities of Cibola.\textsuperscript{2}

It was Coronado who brought the first cattle to Texas. It is said that some of these cattle and horses escaped and were the forerunners of the animals that later roamed the plains. However, other sources point out that there were not a great many cattle on the plains of West Texas before the Civil War. Be that as it may, it appears certain that these animals were not the forerunners of the cattle found later in the Gulf Coastal Prairie by the Anglo-Americans.

Probably the first cattle brought into East Texas were brought by General Alonso de Leon, governor of Coahuila, who made four expeditions north of the Rio Grande between 1687 and 1690 searching for Fort St. Louis, the ruins of which he eventually found somewhere in the vicinity of Matagorda Bay. On the last expedition, a Franciscan priest, Father Massanet, came along and was aided by de Leon in establishing a mission

\textsuperscript{1}Christian Science Monitor, Magazine Section, October 26, 1946, p. 15.

\textsuperscript{2}J. F. Dobie, The First Cattle in Texas and the Southwest, Progenitors of the Longhorns, p. 1.
near the Neches River. A herd of 200 cattle from south of the Rio Grande were delivered to the mission. 3 When the mission was abandoned about 1693 the cattle and other livestock were left behind.

On June 22, 1715, St. Denis, a Frenchman, asserted that the Indians had been afraid to kill the livestock left by the Spaniards and that as a result it had "increased to thousands of cows, bulls, horses, and mares with which the whole country is covered." 4

About 1765 a story was told, and denied, that in conducting the expedition to establish San Francisco de los Tejas Captain de Leon left a bull, a cow, a stallion, and a mare at each of the rivers he crossed, thus accounting for the many cattle that were to be seen in the vicinity of the Colorado and Brazos Rivers. 5 Reports from several persons seem to verify that there were numerous cattle in the region before the era of permanent missions began about 1716.

Wherever the Spanish built missions they took cattle and other livestock. For a period of about thirty years there was a mission located first in Calhoun and later in Victoria County. In 1749 this mission was moved to a location near Goliad where there was another mission. Father

3Ibid., p. 7.


5Dobie, op. cit., p. 7.
Solis, the official inspector of the Texas missions in 1868 for his college wrote in his diary of one of these missions:

It has two droves of burros, about forty gentle horses, thirty gentle mules, twelve of them with harness, five thousand cattle, two hundred milk cows, and seven hundred sheep and goats . . . .

Several missions were reported to have had many more cattle than this. The fact that Spanish settlers in Texas devoted most of their work activities toward ranching does not mean that they did a good job. In the case of the missions much of the work often depended upon the Indians who were not always too reliable. The limited market resulted in cattle having little value other than for their hides and as a source of food for local consumers. There is little wonder that the Spanish rancher did not bother about a few stray cattle. Other cattle became strays as a result of wandering away, or otherwise being lost, from trail herds that were being driven to and from the East Texas missions or to market in Louisiana.

In 1821 the Spanish rule in Texas was replaced by Mexican rule, and in that same year Anglo-Americans began to migrate to the state. Most of them were seeking farm land, but they soon found that "by declaring an intention to raise cattle, they could procure a grant for ten times as much land

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6H. E. Bolton, Texas in the Middle Eighteenth Century, p. 322.
as if they merely declared an intention to farm." A law passed by the Mexican government in 1825 provided that a family which was planning to farm might settle only 177 acres, while a family which was expecting to raise livestock would be given a grant of 4,251 acres. The result was that most of the immigrants avowed their intention to ranch and did so even if to a limited extent.

The Gulf Coastal Prairie was teeming with wild Spanish cattle without mark or brand. Daniel Shipman, one of the first settlers in Fort Bend County, in giving a description of life there said, "When we first came we found hundreds of wild cattle, horses and hogs." Instead of furnishing a source of stock cattle they presented problems.

They had become wilder than the deer and more dangerous to the hunter than the fiercest buffalo, and all efforts to domesticate them were futile. The settlers on the Brazos sent back to Louisiana for their cattle and the natives were so wild that they would not mix with the domesticos. While the wild horses were caught and tamed, not so with the cattle. It was estimated that there were millions of these wild cattle in the coast country between the Sabine and the Rio Grande.

These wild cattle furnished a source of food for the settlers, while occasionally they hunted them for sport.

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7 J. F. Dobie, The Longhorns, p. 29.
9 C. R. Wharton, History of Fort Bend County, p. 39.
10 Ibid., p. 39.
Not all of the cattle in Texas when the Americans came were wild. Many of the Mexican ranchos had large numbers of cattle under control and some of those cattle were sold to the Americans. Others were brought from the United States.

Abner, Joseph, Robert and Peter Kuykendall brought seventy cattle from Natchitoches, La., to the Lower Colorado River country . . . . They turned these cattle loose on a creek New Year's morning of 1822 and named it New Year's Creek. Randall Jones, in 1823, traded a Negro slave in Louisiana for sixty cattle, which he drove back to his place on the Brazos.11

The numbers of domestic stock increased rapidly. J. N. Almonte, in 1833, estimated the number in the Department of the Brazos as about twenty-five thousand.12 Computation from official figures for the year 1856 show that 337,434 cattle were assessed for taxation in the Gulf Coastal Prairie at a value of $1,772,760. This compared with a state total of 1,635,507 at an undetermined value.13

The ease with which cattle could be raised in this region accounts in part for the rapid growth of the industry. The head of the family could devote most of his time to farming, yet within a few years have quite a number of cattle. Early settlers did not consider prairie lands suitable for farming, so there were large areas of open range upon

13 J. de Cordova, Texas: Her Resources and Her Public Men, pp. 305, 308-12.
which the cattle might feed. The suitability of the country for this industry is described in the following:

The prairie lands everywhere afford the very finest pasture, and cannot be surpassed for grazing purposes. So luxuriant is the growth of every kind of herbage, that throughout the year, cattle, grazing in the open country, are generally found in excellent condition; and all the care that is required in rearing stock, is easily obtained by employing a Mexican or two as herdsmen, an occupation for which they are admirably fitted, and which they are said to fulfill with fidelity.  

Jacob DeCordova, a Texas real estate man of the 1850s, had this word of advice to prospective immigrants:

From the appearance of the large herds of horned cattle to be found on her extensive prairies, we feel justified in pronouncing this an excellent stock-country. All that is necessary is for the grazer to locate himself at one of those points of timber that skirts the large prairie, where he will be in the neighborhood of lasting stock-water. Such locations can be easily obtained on Buffalo Bayou from its head to its mouth, clear Creek, San Jacinto River . . . . For stock raising only a small quantity of land is necessary to be purchased: one hundred and sixty or three hundred and twenty acres will be amply sufficient.  

Even though it was easy to raise cattle the cattlemen of Texas often found it difficult to sell them. The chief problem lay in getting the cattle to market. During the Spanish era a few cattle were driven overland to New Orleans. After the Anglo-Americans came they continued to drive a few that way. In 1836 Taylor White drove a herd over the route,


\[15\] DeCordova, *op. cit.*, p. 231.
using the "Old Beef Trail." By 1842 New Orleans had become the chief market. Francis R. Lubbock described the overland route from Harris County, known as the Opelousas trail, as being a "long, tedious, and expensive trip, sometimes very disastrous in consequence of the many rivers to cross." Soon cattle came to be shipped to some extent by water to New Orleans, Mobile and the West Indies. The first shipment appears to have been on a Morgan steamer in 1848 "probably from Galveston." In 1849 a Captain Jerry Smith is reported to have taken a load of cattle aboard his ship, the Palmetto, while in Matagorda Bay. During the same year shipments were made from Indianola.

On April 26 of that year W. H. Foster inserted a "cattle wanted" advertisement in the Houston Democratic Telegraph and Texas Register, asserting that he was building a wharf on Lavaca bay for the purpose of transporting "live cattle" from that place to New Orleans, that he would continue to operate there for six weeks or two months and that thereafter he would conduct the business from Galveston.

Prior to the Civil War limited numbers of live cattle were shipped. During the years 1850-1855, Galveston exported

16 Writers' Project, Texas, A Guide to the Lone Star State, p. 83.
20 McCoy, op. cit., p. 23.
24,920 beef cattle. The year ending August 1, 1859, showed that Fort Lavaca exported 912 head while Indianola exported 16,002 head of beeves.  

In the period before the Civil War the prices of cattle fluctuated somewhat but at no time were they very high. Even though cattle might have a price set upon them it was often the case that they could not be sold for any price in actual money. J. Frank Dobie describes how they came to be used as a medium of exchange in early Texas.

Cattle were so common and money was so scarce that a "cow and calf" represented the medium of exchange . . . . By tacit understanding a cow and calf passed for ten dollars . . . . The custom was for an individual to give a promise to pay one cow and calf, three cows and calves, or any other number. This piece of "cow paper" was passed on from person to person just as bank notes or checks are now, somebody finally presenting the claim and receiving the cattle.

In 1833 Stephen F. Austin stated that fat beeves weighing from 500 to 750 pounds were worth from eight to ten dollars. During the years 1845-48 cattle sold for about four to five dollars per head. The next few years saw a gradual increase in price with some cattle being driven to market through Missouri. Outbreaks of Texas cattle fever in that region brought the drives virtually to a stop causing a drop

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22 Dobie, The Longhorns, pp. 36-37.
in prices again "so that by 1860 the average price of Texas cattle was about six dollars per head."\(^{24}\)

At different times during the years prior to 1875 cattle became so worthless for their beef that they were killed for their hides and tallow. One of these periods came just at the close of the Civil War and another following the Panic of 1873. C. J. La Bauve visited the hide and tallow factories of Jackson County as a young man. Years later he described them to I. T. Taylor.

The Snodgrass Hide and Tallow Factor was located on the west side of West Carancahua Creek . . . . It contained four large wooden tanks large enough to hold eight large beeves each, a daily capacity of from thirty-two to thirty-five head. Hot steam was forced into the wooden tanks that had been filled to capacity with meat. The heat from the steam caused the tallow to melt and come to the surface. It was skimmed off with large shovels into barrels and hogsheds. The meat at this factor was fed to five hundred head of hogs after the tallow was rendered out. Much of the lean meat was cut and fed to the hogs raw or given to anybody that wished fresh meat in any quantity they desired.\(^{25}\)

Such business establishments were to be found scattered throughout the Gulf Coastal area. At Beaumont "the carcasses . . . were thrown into the Neches River to be swept on out into the gulf and become food for fish and carrion fowl . . . .\(^{26}\) Near the mouth of the Colorado W. B. Grimes


\(^{25}\) I. T. Taylor, The Calvacade of Jackson County, p. 166.

had a hide and tallow factory that consumed from 100 to 300 head of cattle a day. Shanghai Pierce had an establishment in the vicinity of Tres Palacios. The biggest operators in the coast country were Allen and Poole who had a packery on Galveston Island. During the winter of 1870-1871 it is reported that they slaughtered 20,000 head of cattle for their hides and tallow alone. 27

Even when the price of cattle was high in the north, such as the period following the Civil War, many cattle were killed primarily for their hides and tallow because these items, too, were high and cattle could be purchased locally very cheap. Some of the factories became packeries and attempted to utilize the meat by salting or pickling it. These efforts met with limited success in some instances and none in others.

In the spring of 1867 an English cattleman named Williams went into partnership with a man named Hughes living at Indianola to establish such a factory. Hughes was to build and operate the factory while Williams furnished the beeves.

By the time Williams could gather up a bunch of his cattle and drive them to the coast, Hughes was ready for business. They made a fine extract of beef that they could hardly give away; they sold prime salt beef at $9 a barrel of 200 pounds and salted tongues at $10 a barrel. The business proved a failure and within

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less than a year's time Williams sold out his ranch claim and the remnant of his stock—on credit. 28

Another effort took place in Victoria.

In 1868 a group of eastern capitalists established a packing plant on the Guadalupe near Victoria. The promoters chose that location for the plant, the biggest in Texas up to that time so that it would be near the cattle range and at the same time would have access to water transportation. Operations were begun on a large scale. But the enterprise was not successful financially. 29

In 1883 the first modern type of meat packing plant in Texas was established at Victoria. Most of the stockholders were local cattlemen. The plant, known as the Texas Continental Meat Company, slaughtered cattle, sheep, hogs, poultry and wild game. The first refrigerator cars used in Texas were operated from this plant. The enterprise was not successful and was forced to shut down in a few years. In 1890 the equipment was dismantled and moved to Fort Worth. 30

The acquiring and selling of hides came to be a business conducted by individuals as well as by the hide and tallow factories. The methods were different. During the days of the open range there were large herds of cattle that migrated to a certain degree with the seasons. During the winter months, as the weather grew colder, they would work closer to the warm coastal areas for protection and good

28 Ibid., p. 7.
29B. Mooney, 75 Years in Victoria, p. 19.
grass. Sometimes they gathered in such large numbers that they ate all of the grass and some grew weak from hunger and died. Others died in the bogs. As the hide would soon ruin and be of no value to anyone there came into existence an unwritten law that anyone who found a dead cow could take the hide. As a result the winter months became known as the skinning season when men rode the range looking for cows from which they might take a three to four dollar hide. This law caused thieves to come into the area. They killed the animals and took the hides. It is said that one good skinner could take ten hides a day. Vigilante committees cleared this situation up.\textsuperscript{31}

Some idea of the importance of the tallow and hide industry in Texas during this period is obtained from the numbers of hides exported. For the fiscal year 1867-1868 Galveston exported about 205,000 hides, some one-half of the total for the state. The next year Galveston exported 302,762 hides while the state total was about 567,000. In the year 1872-1873 nearly 460,000 hides were shipped from Texas ports.\textsuperscript{32}

The period following the Civil War was the period of the great cattle drives into Kansas and Nebraska. It was the Coastal Prairie area between the Brazos and Nueces Rivers

\textsuperscript{31} Taylor,\textit{ op. cit.}, p. 165.

\textsuperscript{32} The \textit{Galveston Daily News}, \textit{op. cit.}, p. 12.
that spawned these great trail drives. The close of the war had brought a demand for meat in the prosperous North. Texas had the cattle. The problem was how to get them there. By 1870 three important routes had been established. They were as follows: (1) by coastwise steamers to New Orleans, via river boats to Cairo, thence to Chicago by rail; (2) overland to shipping points on Red River, by river boat to Cairo, via rail to Chicago; and (3) by trail into Kansas, thence by rail to Chicago.

Among others who initiated trail drives from the Gulf Coastal Prairie were Robert Driscoll who operated in Victoria County and Shanghai Pierce in the Matagorda area.

Two things which greatly changed the cattle industry in the Gulf Coastal Prairie were the building of fences, and the expansion of railroads. The industry was changed throughout the state by these developments but changes occurred first in the region of the Gulf.

J. M. Foster fenced a league of land near Indianola about 1850 with cypress lumber. Preston Rose is said to have fenced 20,000 acres in the Victoria country in 1857, also using lumber. Thomas O'Connor also had wooden fences around a large block of grazing land.

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33 Texas Almanac 1949-1950, p. 256.


In the second half of the century it was the barbed wire fences around the rice fields in the Beaumont area that caused the bitterest opposition as they offered a barrier to the cattle drives through this area to New Orleans, and of course, they were a menace to the free open range of the cattlemen. It is said that the opposition to the rice growers was almost as bitter as that toward the nesters and sheep raisers in west Texas.\footnote{Writers' Project, \textit{op. cit.}, p. 411.}

Growth of the railroads was first and foremost in this area. They did not greatly affect the cattle industry, however, until the local roads were connected with New Orleans and points in the mid-west so that cattle could be shipped all the way by rail. The completion of these roads brought an end to the long trail drives and thereby the animosity against barbed wire fences. It also gave a boost to the prices paid local producers for their cattle.

Even though the Gulf Coastal Prairie abounded in cattle the quality was very poor. Predominantly the cattle were Longhorn or scrub cattle of the Old South, which the Anglo-Americans had imported, or a mixture of the two. Only this type of cattle, it seemed, could survive in the area. Although this was, for the most part, an excellent grazing region, the summers were hot and humid and the region was invested with flies, ticks and other insects. Coastal ranges
were made use of during the winter months almost exclusively. In the spring the cattle were driven inland to drier areas. Importations of thoroughbred cattle usually resulted in the loss of those cattle to the Texas fever which was carried by the tick. Fear of such a loss hindered progress of the industry. 37

Evidence of Texas or Spanish fever had been noted in the decade before the Civil War when Texas cattle had been driven to northern markets through Missouri. Native cattle of that state contracted the disease and died in large numbers. The same thing happened during the period of trail drives following the War. At the time no one was sure of the exact cause of the disease or of how it was transmitted although there were a number of theories. 38 It was noted that the disease seldom killed the Texas cattle. A number of the states through which Texas cattle were being driven to market passed legislation in an attempt to control the situation but met with little success. Finally the federal government enacted laws to control the disease. It was determined that the tick was the carrier, and in 1906 a federal quarantine was placed upon 198 counties in Texas requiring that cattle be dipped to rid them of ticks before they could

37 G. M. Lewis, A Market Analysis of the Cattle Industry of Texas, p. 120.
38 McCoy, op. cit., p. 224.
be shipped out of the area. The Livestock Sanitary Commission of Texas, established in 1893, worked to eradicate the tick and lift the quarantine. Work did not really begin in earnest until 1917. Dipping pens were built in one or more places in each county and systematic dipping of cattle began to take place. By 1938 only six counties were still under complete quarantine, none of these being in the Gulf Coastal Prairie. 39 Ticks were not and have not been completely eliminated, and cattle are still dipped frequently during the year as a preventive measure. The fight against the tick has made it possible to introduce and raise successfully European breeds of cattle such as the Hereford and Shorthorn.

"The most important event to pioneer Texas cattlemen was the introduction of Brahma or Zebu cattle from India, a variety scientifically designated as Bos Indicus." 40 The Brahma's thick hide proved impervious to the ticks, flies and mosquitoes; he thrived on the grasses of the region; and he continued to graze when the sun became so hot that it drove other cattle to the shade. More important was the fact that cattle produced by crossing the Brahma with other breeds proved to have inherited these characteristics with the ability to transmit them to their offspring. At the same

39 Texas Almanac 1939-1940, p. 205.
40 Writers' Project, op. cit., p. 83.
time the cross-breeds proved to be better beef cattle than the Brahma.

The first record of a successful crossing of these cattle with native stock was in 1874 when Captain Mifflin Kenedy experimented with his herds. However, the introduction of Brahma cattle in large numbers did not really occur until about the turn of the century. T. M. O'Connor, son of Thomas O'Connor, joined A. P. Borden of the Pierce Estate in importing a commercial herd from India. At the time, 1906, this was the largest importation to have reached Texas.

As the Brahma cattle were worshipped in India, it required strategy to secure them. The exporters pledged that they would never be killed. The cattle were shipped by boat to New York, loaded on a cattle train and brought to Wharton County.\(^{41}\)

Jas. A. McFaddin of Victoria County also stocked his ranch with Brahmas. He began his herd about 1903 or 1904 with the purchase of the famous bull, Prince, from the Hagenbeck circus in St. Louis. Most of his foundation stock came from East Texas and Louisiana. He then used the O'Connor-Borden stock to improve his herds until they were among the most outstanding in the state.\(^{42}\)

The Brahman cattle have proved to be the great lifesaver and rejuvenator of the cattle industry in the Gulf Coastal Prairie. Although Brahmas comprise only fifteen per

\(^{41}\) F. M. Hughs, *Legends of Texas Rivers*, pp. 41-42.

cent\textsuperscript{43} of the cattle of Texas they are the leading breed in this region. Very few of them are thoroughbred, most being crossed with other breeds. The most popular crosses are with Shorthorn and Hereford. \textsuperscript{44} On the drier prairies of the inland areas are to be found pureblood herds of Hereford and other breeds.

Another breed of cattle which may prove as important to the Gulf Coastal Prairie as the Brahma is the Santa Gertrudis. Three-eighths Brahman and five-eighths Shorthorn, this new breed was developed by Robert Kleberg on the King Ranch. \textsuperscript{45} Development of the breed began by chance in 1910. In the fall of 1950 the ranch held its first public auction at which one bull sold for $10,000 to Edgar Brown of Orange, Texas. \textsuperscript{46} The potentials of the Santa Gertrudis are well described in the following quotation:

It was not only the first breed ever developed in the U. S.; it was also the first new breed developed anywhere in more than 100 years. And from all evidence it was the sturdiest, fattest, most efficient grass burner the cattle world has ever seen anywhere.

\ldots The new breed combines the tough resistance to heat, insects, and disease of the humpbacked Brahman with the sleek carcass conformation and fine beef qualities of the Shorthorn \ldots Four-year-old Santa

\textsuperscript{43}Texas Almanac 1949-1950, p. 241.
\textsuperscript{44}W. T. Chambers, The Geography of Texas, p. 104.
\textsuperscript{45}This ranch is not in the Gulf Coastal Prairie.
\textsuperscript{46}"Santa Gertrudis: A Lot of Beef," Fortune, XLIII (May, 1951), 96.
Gertrudis steers will outweigh their British cousins by 200 pounds or more.47

A project which offers great possibilities is that of pasture development. Experiments being conducted in east Harris County "give every indication of grazing from two to three cows per acre the year around"48 on soil that less than five years ago was doing well to support one cow on twenty acres. The answer lies in the use of improved pasture grasses and fertilizers.

The importance of the grazing industry in and to the Gulf Coastal Prairie is indicated by the numbers of cattle found there and the amount of land devoted to grazing. Tabulation for the year 1945 based on information in the Texas Almanac 1949-1950, shows that out of some 4,980,000 acres devoted to cropland and pasture, about 79 per cent, or 3,927,000 acres, was turned to grazing.49 As for numbers of cattle this region had, in 1945, 694,296 head which compared with a state total of 7,900,000. These figures show that one of every twelve head of cattle in Texas is to be found in the thirteen counties of the Gulf coast.

47 Ibid., pp. 96-97.
48 The Houston Chronicle, July 1, 1951, Section A, p. 29.
Computation of statistics for the years 1910\textsuperscript{50} and 1935\textsuperscript{51} shows the ratio to have been about the same.

The counties with the most cattle in 1945 were Harris, Matagorda, Victoria, and Wharton. Harris led the state with 107,000 head while each of the other counties listed above had more than 70,000.\textsuperscript{52} In 1930 Victoria was the banner county of Texas with 93,997 head while Harris County had only 72,079.\textsuperscript{53}

Dairying is an important phase of the livestock industry in the Gulf Coastal Prairie. It has become increasingly important with the growth of major urban areas and the industry for the most part centers in those counties. Harris, with the largest city in the state, has the most dairy cattle and produces the most milk of any county in the state.\textsuperscript{54} Wharton, Fort Bend, Brazoria, Jefferson, and Victoria counties all have more than 5,000 head of dairy cattle. Only Chambers and Calhoun Counties, neither of which has any large cities, have less than 1,000 dairy cattle.

The introduction of hogs and sheep into the Gulf Coastal Prairie came about in the same way and at the same time as

\textsuperscript{50} Johnson, op. cit., II, 650-721.
\textsuperscript{51} Texas Almanac 1939-1940, pp. 205-8.
\textsuperscript{52} Texas Almanac 1949-1950, pp. 250-252.
\textsuperscript{53} Mooney, op. cit., p. 31.
\textsuperscript{54} Texas Almanac 1949-1950, p. 242.
that of the cattle. The hogs, like the cattle, grew wild and lived off the land. The Mexican, Colonel J. N. Almonte, reported to his government in 1834 that there were no sheep in the department of the Brazos but that herds of swine were numerous. He estimated the number at 50,000 head. Daniel Shipman described the wild hogs as being different from the domestic. He said that they would not mix with the latter and were not very good to eat. Nonetheless they were hunted and eaten by the settlers.

Raising of hogs in this region has been primarily for home consumption rather than for a commercial market. In numbers, hogs rank second to cattle, however, they are comparatively few with a total of only 72,553 in 1945.

Worms of various kinds and the scarcity and high price of grain feeds ... handicap the hog industry. Sheep are raised in small numbers, but they have even more difficulty with worms in this warm and humid region than do hogs and are usually less profitable than cattle.

That these animals are raised to the extent they are is due in part to the demand created by markets in such cities as Houston, Galveston, Beaumont, Port Arthur, and Orange.

In contrast to cattle, horses were very valuable. Oxen were used to a considerable extent in the early days but

55 Johnson, op. cit., I, 171.
56 Wharton, op. cit., p. 39.
57 Chambers, op. cit., p. 104.
gradually came to be replaced by the mule. Both horses and mules were considered necessary to the successful operation of farm and ranch. Although climatic conditions were not conducive to the breeding of these animals they were raised for restocking purposes. Computation of statistics for 1913 shows that there were about 90,000 mules and horses, including colts, in the Gulf Coastal Prairie.\(^58\) There was no decrease between that time and 1935 as the census for that year shows the region to have had a total of 92,201 horses and mules.\(^59\) However, by 1945 the number had decreased to 56,101.\(^60\) This decrease appears to have been the result of the introduction of motorized farm machinery as the number of mules decreased from 48,964 to 19,298 while the number of horses decreased from 43,237 to 36,303. As this region is largely range land, horses are needed in the working with cattle and a large decline in their numbers is not to be expected.

\(^{58}\) Texas Almanac 1914, pp. 220-22.

\(^{59}\) Texas Almanac 1939-1940, pp. 205-8.

\(^{60}\) Texas Almanac 1949-1950, pp. 250-52.
CHAPTER III

DEVELOPMENT OF FARMING

Farming in the Gulf Coastal Prairie had its beginning with the crude cultivation of the Indians whose efforts were limited to the raising of small plots of maize, beans, and pumpkins. The first efforts to till the soil of this region by white men were conducted by members of the ill-fated LaSalle expedition which landed in the Matagorda Bay area. Agricultural efforts on the part of the Spanish were limited to the production of only enough food for their settlements. Their chief interest was ranching. Farming on a commercial scale did not begin until after the coming of the Anglo-Americans in 1821.

The Spaniards who had sailed along the Texas coast, and those who had marched through the area in search of LaSalle and his party, did not feel that the Gulf Coastal Prairie was a desirable place to live. The presidio of La Bahia and the mission Espiritu Santo de Zuniga were established on Garcitas River, near Lavaca Bay about 1718, but were later moved inland to a point on the Guadalupe River near the present site of Victoria, and later to Goliad.\(^1\) Other than this

\(^{1}\)H. E. Bolton, *Texas in the Middle Eighteenth Century*, pp. 5-6.
one effort Spanish settlements were confined to the fringes of the region. Inasmuch as the few Spanish settlers who came to Texas were not primarily interested in farming except as a necessity, and the mission fathers were unable, in spite of their great efforts, to create a love of work in the fields on the part of the Indians, cultivation of the soil was limited throughout Spanish Texas. In the Gulf Coastal Prairie there was less.

That parts of this area offered great possibilities to the immigrant is indicated in the writings of Elias R. Wrightman who was one of the surveyors in Austin's colony and a member of the "Old Three Hundred."

A farmer from the northern country who is used to industry, and with no other force than his own and one or two hirelings, may commence in the first place—on a new plantation—about the first of November, and with a good ox team may plow with one of the cast paten plows . . . one-half acre per day, and by the first of February could not fail of having thirty acres ready for planting, which put into corn in the month of February. . . . would be no risk in calculating twenty-five bushel to the acre. 2

During the first few years of Anglo-American immigration corn was the most important crop, with cotton running a close second. This was true because of the great demand for corn as a food by the settlers and by the many immigrants who were pouring into the state through this region. On some few farms as many as two crops of corn a year were made. In 1840

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2 M. S. Helm, Scraps of Early Texas History, p. 188.
the price of corn was twenty-five to thirty-seven and one-half cents a bushel. With wheat becoming generally available corn continued to be one of the chief crops, being produced for sale as feed for freighting teams and for shipment to other countries. In Victoria County corn occupied more acreage than any other crop until after 1900. The average yield was from forty to eighty bushels per acre.

According to the terms of his grant, Austin could not give to settlers grants of land which lay along the Gulf. This did not displease the settlers as this land did not appear desirable. The drainage, if any, was very poor. In selecting a grant, one was chosen, if possible, which had frontage on some river or creek, and one which had plenty of wood and water available. Land covered with a dense growth of cane was highly desirable for farm land. The cane was not only an indication to the settler of the richness of the soil, but it could be easily cleared for cultivation.

S. A. McMillan describes the method used:

Some of the green cane was hacked down and allowed to dry, then when the wind was right a fire was set and the brake usually burned out clean to the great discomfort of the rattlesnakes which had hitherto held undisputed possession. The loose rich loam need only to be planted, which at first was done by jabbing a hole with

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3"Inventory of the County Archive of Texas, No. 120, Jackson County" (Prepared by the Texas Historical Records Survey, 1940), pp. 5-6. (Mimeographed.)

a heavy sharp stick, and dropping the corn, beans, or pumpkin-seed therein. No cultivation was necessary the first season and often two crops were made before the land grew foul with weeds. 5

Corn culture has played an important role in the agricultural history of this region even though it has not been an important cash crop. It has occupied a large acreage in some counties and has been important as a stock feed on the farms and ranches both to livestock and poultry. Actual acreage varies greatly from county to county with those counties lying along the coastal lowlands planting very little corn. In 1945 Fort Bend, Wharton, and Victoria Counties had acreages of 38,649, 36,452, and 27,330, respectively; while Galveston, Orange, and Jefferson Counties have a total of 1,602 acres. 6

The second most important food crop in colonial Texas was the sweet potato which yielded abundantly throughout the area where soil was well drained. Elias R. Wightman tells of using it as a substitute for bread. Plantation owners found it a very good food for their slaves. 7 Mary Austin Holley, who visited Texas in 1831, told of the ease with which sweet potatoes were raised, with a yield, at times, of "five hundred bushels to the acre. Some of these potatoes

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5 S. A. McMillan, The Book of Fort Bend County, Texas, p. 65.
7 Helm, op. cit., p. 189.
weigh from four to seven pounds. Yet they sell, at Brazoria, at the enormous price of seventy-five cents a bushel.  

Other crops which found favor with the early settlers were cotton, tobacco, sugar cane, rice, indigo, beans, pumpkin, and melons of various kinds.

The economy of the Gulf Coastal Prairie as a whole is not predominantly agricultural, nor is most of the land under cultivation. Nevertheless, farming has played an important role in this region from the beginning of Anglo-American settlement, and at times that role has been the leading one. This region has its specialty crops in which it is or has been a leader in the state and nation. Among these are sugar cane, rice, figs, and flax.

The soils of the Gulf Coastal Prairie are suited to a great variety of crops. The long frost-free growing season, together with mild winters, provides climatic conditions favoring several types of agricultural industry. However, the region has a heavy rainfall, and that coupled with inadequate drainage over most of the coastal counties and some parts of the others, causes much of the land to stay wet too long for successful crop raising. Agricultural development is least extensive over the eastern section.

It is, however, more general in the western and central sections where rainfall is lower and considerable areas

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8 M. A. Hatcher, Letters of an Early American Traveller, Mary Austin Holley, Her Life and Her Works, 1784-1846, p. 162
have moderately free natural drainage. In the drier sections cotton is generally the important crop grown with some corn and other feed crops, and in some of these counties rice is grown extensively. In the eastern section rice is the chief crop, though some corn and other crops are grown, but very little cotton is produced.\(^9\)

It did not take cotton long to displace corn as the chief money crop of Texas and the Gulf Coastal Prairie. Commercial planting of cotton was begun by Jared Groce who became known as the father of Texas agriculture because of his efforts.\(^10\) Shipment to New Orleans began in 1823 when 5,000 bales were exported.

The cultivation of cotton grew rapidly along the streams of the region which furnished transportation outlets for the crops. In 1833 Stephen F. Austin reported to the officials in Mexico City that there were thirty gins in the municipalities of San Felipe and Brazoria, and that the Texas cotton crop of that year would amount to about 7,500 bales.\(^11\) Brazoria County was outstanding in this area and throughout the state for many years for the value of its farm products.

As early as 1846 Brazoria County alone produced ... over ten million pounds of cotton, twice as much as any other county, and the total value of property in the County was one and three quarter million dollars which was three times as much as that of any other county.


\(^11\) Ibid., p. 76.
Ten years later it was still one of the richest counties in the state, the taxable values having increased three-fold.\textsuperscript{12}

Extensive cultivation of cotton was undertaken about 1830 with crops of two bales to the acre not uncommon.\textsuperscript{13}

Prior to the time of the Republic the growing of cotton was confined almost entirely to the Gulf Coastal Prairie and along the rivers of Texas. This was a result of the rivers offering a means of transportation plus a common belief that cotton would not yield well on the prairie land. In the Gulf Coastal Prairie the idea that the prairie land was no good for the plow persisted up until about 1860 or 1885. About this time truck industries were started in some areas. Before this the prairie land had sold for fifty cents to three dollars an acre, while fertile bottom land brought from twenty to forty dollars an acre.\textsuperscript{14}

The cultivation of cotton continued to increase in importance until the time of the Civil War. That conflagration brought disaster to the entire economic structure of Texas. The freeing of the slaves brought about the breakdown of the plantation system and the abrupt decline of its chief crop—cotton. Brazoria, Fort Bend, Wharton, and Waller Counties,

\textsuperscript{12}S. G. Reed, \textit{A History of Texas Railroads}, pp. 79-80.

\textsuperscript{13}A. L. Allhands, \textit{Gringo Builders}, pp. 229-30.

where the plantation system had been the most important, were hurt the most. From the paralysis wrought they recovered more slowly than many others. Although cotton acreage increased slowly the production of the Coastal Prairies was of little importance even by 1890.\textsuperscript{15} The cotton industry was struck another body blow when the Mexican boll weevil crossed the border into Texas at Brownsville in 1892.\textsuperscript{16}

Table 2, based on information given in the \textit{Texas Almanac 1949-1950}, shows the production of cotton in the counties of the Gulf Coastal Prairie for given years since 1900. Crop failures account for some of the variations in production; however, the large increase between 1906 and 1926 was the result of a marked increase in acreage which began about 1910.\textsuperscript{17} Decreases in production were brought about beginning in 1933 with the introduction of the government crop acreage control program. Acreage planted to cotton in this region in 1950 was 218,000 acres with a production of 118,000 bales. This was a decrease below the 1949 crop of 95,000 acres and 94,000 bales.\textsuperscript{18}

\begin{footnotes}
\item[17] \textit{The Daily Times Herald}, January 14, 1951, Section 7, p. 15.
\end{footnotes}
<table>
<thead>
<tr>
<th>County</th>
<th>1906</th>
<th>1926</th>
<th>1939*</th>
<th>1944*</th>
<th>1947</th>
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<td>6,434</td>
<td>2,579</td>
<td>5,255</td>
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<td>10,253</td>
<td>10,570</td>
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<td>7,724</td>
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<td>Chambers....</td>
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<td></td>
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<td>Fort Bend...</td>
<td>28,100</td>
<td>38,260</td>
<td>33,885</td>
<td>30,590</td>
<td>34,382</td>
</tr>
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<td>Galveston...</td>
<td></td>
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<td></td>
<td>14</td>
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<td>5,576</td>
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<td>Jefferson..</td>
<td></td>
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<td>Matagorda..</td>
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<td>8,478</td>
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<td>Victoria...</td>
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<td>Waller.....</td>
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<td>7,244</td>
<td>2,200</td>
<td>2,289</td>
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<tr>
<td>Wharton....</td>
<td>20,581</td>
<td>40,053</td>
<td>37,941</td>
<td>29,527</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>96,922</td>
<td>164,959</td>
<td>129,652</td>
<td>91,071</td>
<td>118,259</td>
</tr>
</tbody>
</table>

*Figures in these columns show bales harvested in counties. Other columns show bales ginned, some of which may have come from other counties. Where no figures are shown for certain years, it is an indication of little production and no gins in the county.

Over the period of years the Gulf Coastal Prairie has proved itself adaptable to the successful culture of a number of crops which are not common throughout the state as a whole. Among these are sugar cane, rice, figs, and flax.

Sugar cane was another of the early crops of Texas which grew into importance commercially. Immigrants from the United States and Europe tried planting a little of everything on an experimental basis, sugar cane being no exception. Some of
the first settlers in the Beaumont area produced sugar cane and manufactured for home use a coarse grade of sugar. In his report to the Mexican government in 1833 Stephen F. Austin listed sugar cane as being one of the crops of Texas. Some three years earlier in writing a description of Texas he stated that about 70,000 acres of land in the state were adapted to the growth of this crop.

Counties of the Gulf Coastal Prairie which have proved important in the production of sugar cane are Brazoria, Fort Bend, Matagorda, and Wharton. Prior to the Civil War and for a time thereafter Brazoria County led the state in its production. Sources disagree as to the exact time commercial production of sugar cane began. That it was being grown by 1840 there is no doubt. One writer says of Brazoria County that:

in 1840 sugar cane was introduced, and in about seven years it had become one of the leading agricultural products of the country. At this time there were ten or fifteen large sugar mills in the county, and some large plantations made annually as much as 1,200 hogsheads of sugar. The industry grew very rapidly and production was so greatly increased that the price of molasses fell to such a degree as to make its production...

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21Reed, op. cit., p. 7.
unprofitable. During this period of depression molasses was fed to stock or allowed to go to waste.\textsuperscript{22}

In describing the wealth of the plantation owners of Brazoria County S. G. Reed says that "as early as 1848 Brazoria County alone produced over five million pounds of sugar, ten times as much as all the other counties in the state combined."\textsuperscript{23} The sugar cane industry grew rapidly until 1860. As with cotton, the freeing of slaves dealt the industry a serious blow. The industry was one which required a great deal of hard work on the part of the slaves.

Sugar cane culture had its beginning in Fort Bend County on the Williams plantation about the same time as in Brazoria County and proved highly successful. In the fifty year period following the Civil War, Fort Bend County equaled and then surpassed Brazoria County in the amount of sugar cane harvested.

In 1880 Brazoria County was credited with 3,358 acres in sugar cane, while Fort Bend had an acreage of 1,738. The census of 1910 gave Brazoria County an acreage of a little over two thousand in sugar cane, while Fort Bend County had 6,775 acres, producing more than ninety thousand tons of cane. Of the thirteen sugar mills in Texas in 1910, four were in Fort Bend County.\textsuperscript{24}

\begin{footnotesize}
\begin{enumerate}
\item Bennett and Jones, \textit{op. cit.}, p. 350.
\item Reed, \textit{op. cit.}, p. 79.
\item F. W. Johnson, \textit{op. cit.}, II, 652.
\end{enumerate}
\end{footnotesize}
Wharton County was also an important producer having 10,000 acres in 1903. It did not long retain such large acreage having less than 5,000 acres in 1910.\textsuperscript{25}

There has been a gradual decline in the acreage devoted to sugar cane during the past forty years. The acreage in the Gulf Coastal Prairie alone was more than 13,000 acres in 1910. During the period 1937-1946 the average for the entire state was about 4,000 acres, while the harvest for 1947 and 1948 was from only 2,000 acres.\textsuperscript{26}

Originally the sugar cane was processed so as to make both sugar and syrup while in recent years it has been used only for the syrup. The sugar which came from the kettles of the plantation mills of the nineteenth century was rather coarse. The price obtained for it depended in part upon the fineness of the grains and how white it was.

In 1891 a large sugar refinery was built at the present site of Sugarland, Fort Bend County. This mill had its beginning some twenty years before when a large cane grinding mill was erected on the site for the purpose of taking care of locally grown cane, converting the juice into syrup and plantation sugar. As the refinery prospered a little community came into existence adjoining the mill properties.

\textsuperscript{25}Ibid., p. 658.

\textsuperscript{26}Texas Almanac, 1949-1950, p. 229.
At this time most of the labor on the plantations was performed by convicts leased from the state of Texas, and from the tales of cruelty that were circulated, the town of Sugar Land was nicknamed "Hellhole on the Brazos."  

This system was later abolished.

In 1908 the present owners of the Imperial Sugar Company acquired control. They modernized not only the plant, but the town as well. In 1925 the plant had a daily production capacity of 1,000,000 pounds of pure refined sugar. Following World War II, about 1948, the company undertook a $4,000,000 improvement program. With a daily production capacity of 2,000,000 pounds the company now boasts the world's only air-conditioned sugar packing room. Although at one time the refinery depended upon local production, it now imports all of its raw sugar from Cuba and the West Indies, having imported some forty-nine full cargoes through the port of Galveston in 1950. Imperial Sugar Company, the only sugar refinery in Texas, markets its products in thirteen states.

The Gulf Coastal Prairie produces most of the state's rice crop. In 1947 this area had some 83 per cent of the rice acreage with Wharton and Brazoria Counties leading the

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28 Ibid., p. 157.
29 The Daily Times Herald, January 14, 1951, Section 7, p. 2.
parade with 73,000 and 66,000 acres, respectively. All of the counties in the Gulf Coastal Prairie have at some time produced rice commercially, with Jefferson County having the distinction of being the first and largest producer over a long period of years.

Today, rice is grown entirely under irrigation primarily on the Hockley-Katy group of soils. The most important varieties are Rexora, Texas Patna, and Bluebonnet. Water for irrigation is taken from the lower course of the Sabine, Neches, Trinity, Brazos, Colorado, and Lavaca rivers and other streams and from wells. It is pumped through canals to the fields. Canal companies provide a large amount of the water used in irrigation.

It was the Acadian French settlers from Nova Scotia who first began to grow rice in Louisiana. From there its culture spread to Texas.

The first rice grown in Jefferson county was planted by David French, on the old French homestead, three and one-half miles north of the city of Beaumont, soon after the close of the Civil War. At that time irrigation systems were unknown in this section, and the grower trusted in providence for sufficient rainfall.

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31 A. C. Magee, Information Basic to Adjustments in Rice Production in Texas, p. 7.
33 F. M. Hughes, Legends of Texas Rivers, p. 72.
to mature the crops. In fact such crops were designated as "providence rice." 34

These early settlers created an artificial water supply by damming the rainfall in the fields with levees thrown up with shovels, thus holding the water until needed, when the levees were cut and fields flooded. Frequently no rain fell and the crop failed utterly to pay the cost. 35

In 1886 French brought from Louisiana some old machinery and erected a small rice mill on his farm. As he was not a mechanic and did not know how to repair the machinery when it broke down, the mill failed.

The first commercial production of rice came in 1886 when Louis Bordages and Edgar Carruthers planted about 200 acres near Fannett. This was "providence" rice, but a good crop was made.

Irrigation in Jefferson County was begun in 1891 when W. G. Lovell, B. C. Hebert, and Joe Broussard built several small pumping plants on Taylor's Bayou. These plants demonstrated the value of the soils of this region for rice culture when scientifically grown, and brought about the formation in 1898 of the first irrigation company, the Beaumont Irrigation Company, which eventually attained an irrigation capacity of 25,000 acres. Other companies formed about this time were: McPaddin-Wiess-Kyle Canal, with a

35 Hughes, op. cit., pp. 72-73.
capacity of 10,000 acres; Fort Arthur Rice Canal, with a
capacity of 10,000 acres; and the Treadway Canal, with a
capacity of 35,000 acres.  

Successful production of rice brought about the con-
struction of rice mills which in turn encouraged the in-
creased production of rice. Joe Broussard built the first
rice mill in Beaumont which was known as the Beaumont Rice
and Grist Mills.

In 1907 K. Kishi, a wealthy Japanese nobleman, estab-
lished a Japanese colony at Terry, in central Orange County,
and began intensive cultivation of rice. His success en-
couraged others to increase acreage with the result that
there was a bumper crop in 1909 which broke the market.
This led to the organization of the Southern Rice Growers
Association which in 1918 launched a widespread campaign to
encourage people to eat more rice. However, the following
year, over-production again paralyzed the market. As a con-
sequence Kishi renounced rice farming and turned to truck
gardening which has proved highly successful.

Jefferson County has not always led the parade of rice
producing counties as indicated by acreage figures for 1948

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36 Stratton, op. cit., pp. 140-41.

37 "Inventory of the County Archives of Texas, No. 181,
Orange County" (Prepared by the Texas Historical Records
(previously given). Since the turn of the century all of the counties of the Gulf Coastal Prairie have produced rice in greater or lesser amounts. Within recent years drainage projects on a large scale have made increased acreage available on hitherto unusable land. For example: rice acreage for 1951 was estimated at 62,000 acres in Chambers County and 22,000 acres in Galveston County. This is an increase of 10,000 acres over the 1947 crop in each of these counties. Other counties have made like increases.

Over the years methods of cultivation have changed considerably. A comparison can best be made by describing the earliest process with the latest. The early method consisted of plowing the lowlands in the early spring with a walking plow drawn by oxen, sowing the rice broadcast and harrowing it in with a wooden-tooth harrow, levelling the field with a small embankment—then waiting hopefully for the necessary rainfall to irrigate the crop.

Today there is motor drawn equipment to prepare the ground and drill in the seed, combines to harvest the grain, and extensive irrigation systems to furnish the needed twenty-five inches of water.

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38 Letter from J. R. Carroll, County Agricultural Agent of Chambers County, March 6, 1951.
39 Letter from M. B. Viesman, County Agricultural Agent of Galveston County, March 7, 1951.
40 Writers' Project, *op. cit.*, p. 195.
The latest and probably the greatest, mechanization of rice production in the Gulf Coast area is the planting of rice from a plane. Jefferson county has taken the lead in this work in 1946, where between 5,000 and 6,000 acres have been seeded from the air this year.\(^{41}\)

World War II had a marked effect on the rice industry in Texas causing it to expand enormously. Wartime demand brought about a rapid rise in price from $2.30 per barrel in 1939 to $6.34 per barrel in 1943. Acreage increased from 291,000 acres in 1940 to 396,000 acres in 1943.\(^{42}\) The post-war period has provided no let-up but rather a continued increase in demand. Acreage in 1950 was 1,675,530 acres with an average yield of 12.3 barrels per acre, and a price of more than $9.50 per barrel. Jefferson County was first in production with some 350,000 barrels.\(^{43}\)

Prior to World War II most of Texas' rice was exported to Cuba and the islands of the West Indies.\(^{44}\) United States government buying for relief abroad has sent much of this rice overseas since the war. Farmers are worrying about the possible end of this relief buying and a resumption of competition with Asian producers.\(^{45}\)

\(^{41}\) Whitlow, op. cit., p. 15. \(^{42}\) Magee, op. cit., p. 5.

\(^{43}\) The Daily Times Herald, January 14, 1951, Sec. 7, p. 4.


\(^{45}\) The Daily Times Herald, op. cit.
Fig tree culture in the Gulf Coastal Prairie dates back to the early Anglo-American settlements when they were grown principally for home consumption. In describing the Texas of 1848 the German immigrant, Viktor Bracht, told of seeing various kinds of fruit trees, "especially peach trees, figs, pomegranites, plums, and mulberries ..."\(^{46}\) and Governor Lubbock told of the fine fig trees in the orchard on his ranch in Harris County about 1850.\(^{47}\)

Commercially the story of fig-growing began in 1902 when the first small plantings were made at the little town of Algoa in Galveston County. The fig growing area stretches from Algoa northeastward along the coast to Beaumont. The Magnolia fig is grown for canning and preserving while the Texas Everbearing is grown for the fresh market. The Magnolia fig has dominated the industry.

Initial growth of the industry was not rapid. By 1910 there were some five to six hundred acres of trees in Galveston County and about three to four hundred acres in Brazoria County.\(^{48}\) Growth was more rapid during the next decade and the industry reached its peak in acreage plantings in the period 1925 to 1928, when between 20,000 and 25,000

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\(^{46}\) V. Bracht, *Texas in 1848*, translated by C. F. Schmidt, p. 34.


acres of land was in fig orchards.\textsuperscript{49} By 1925 there were 10,000 acres of trees in Galveston, Brazoria, and Harris Counties.\textsuperscript{50} Over in Jefferson County acreage increased from fifty-three acres in 1920 to 1,800 acres in 1927.\textsuperscript{51}

The future of the industry seemed assured. In 1925 figs were bringing about six cents a pound at the preserving plants, and orchards were producing from 600 to 12,000 pounds of fruit per acre depending upon age of the trees and the many climatic factors.\textsuperscript{52} In Galveston County alone there was a production of 10,000,000 pounds in 1927.\textsuperscript{53} A. E. Menn voiced the optimism of the industry in telling of the industry in Orange County.

Much attention is now being devoted to fig raising. One of the important features about the fig business in this section is that climatic conditions are so well adapted for fig production that they yield a heavy crop over a long period and have never been known to be killed out by cold weather.\textsuperscript{54}

During the period from 1920 to 1925, many new preserving plants were built and by 1926 there were seventeen plants in operation. Seven of these were in the Galveston-Houston area.

\textsuperscript{49} A. B. Kennerly, "Will the Fig Industry Come Back in Texas?" \textit{Farm and Ranch} (January, 1944), p. 6.

\textsuperscript{50} F. A. Briggs, "10,000 Acres of Figs in Three Counties," \textit{Farm and Ranch} (October 3, 1925), p. 2.

\textsuperscript{51} Plummer, \textit{op. cit.}, p. 77. \textsuperscript{52} Briggs, \textit{op. cit.}, p. 2.

\textsuperscript{53} Plummer, \textit{op. cit.}, p. 170.

\textsuperscript{54} A. E. Menn, \textit{Texas As It Is Today}, pp. 154-55.
These plants, largely organized by the fig growers themselves, were underfinanced and inexperienced in the processing and sale of canned foods. A surplus of the products and the accompanying evil of price-cutting below necessary profits soon demoralized the market and many plants were forced to close. Today only a few plants are active.  

From the large acreage, previously described, there was a rapid decline until not more than 1,500 acres of trees were left. Today most of the figs of this region are grown south and southwest of Houston in Galveston and Brazoria Counties. As of 1948 annual production was about 2,000,000 pounds with a market value of more than $75,000.  

M. B. Vieman, County Agricultural Agent of Galveston County, had this to say about the industry: "The figs have proven their adaptability and while the industry is not now as extensive as it was in years past, it is still a sizeable farm enterprise."  

The newest crop of considerable commercial importance in the Gulf Coastal Prairie is flax. First commercial acreage of flax planted in Texas was in 1935 when 1,000 acres were planted. By 1947 the acreage was 91,000 acres and in 1949 it was 300,000 acres.  

This new agricultural industry has centered to the southwest of the Gulf Coastal Prairie in

55 Kennerly, op. cit., p. 6.
56 Texas Almanac, 1949-1950, p. 228.
57 Letter from M. B. Vieman, op. cit.
58 "Flax, Miracle Crop," Ranch and Farm News (June 5, 1949), p. 34.
Karnes County where in 1947 the Archer-Daniel-Midland Company erected a large plant to process the flaxseed. Wharton, Jackson, Victoria, Calhoun, and Matagorda are the flax producing counties of the Gulf Coastal Prairie.

"The biggest drawback in growing flax is weeds, but dusting by plane with chemicals is beginning to work that problem out for the flax farmers."^59 Flax is planted in the fall and grown during the winter months, being harvested in February. A new crop, guar, is being planted and grown on the land during the spring and summer to rebuild the soil.^60

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CHAPTER IV

DEVELOPMENT OF TRANSPORTATION

The key to the economic development of the Gulf Coastal Prairie, as to all of Texas, lay in the development of transportation facilities. In some respects this region was more fortunate than others. It lay near the coast and the rivers could be used to a limited extent. On the other hand the many rivers were barriers to overland transportation and the level prairie lands were exceedingly difficult to cross in wet weather. At the same time the region was a focal point for the trade and commerce of much of the state which made its transportation needs greater.

As the Spaniards had not settled this part of the state there were no roads or trails to be found at the time Austin brought his first colonists. With the passage of time travel between given points tended to follow routes which came to be known as roads. Thus wagon trails leading out of Houston were known as the San Felipe Road, the Washington Road, the Richmond Road, the Montgomery Road, and the Liberty Road.\(^1\) There was a road from Indianola to San Antonio over which much freight passed on its way to the frontier army posts.

One of the prairie roads was described by Frederick Olmsted who traveled through Texas about 1855.

The road was a mere collection of straggling wagon ruts, extending for more than a quarter of mile in width, from outside to outside, it being desirable in this part of the country rather to avoid a road than to follow it.²

In 1848 Viktor Bracht offered the compliment or criticism that, "there is no lack of roads in Texas. In fact there are so many that a traveler often has difficulty in determining which one to take."³

The means of transportation over these roads, other than by walking and by horseback, was by wagon, cart, and sled. To haul freight over inland routes there were stout wagons drawn by as many as seven yoke of oxen. The men who drove these wagons were called freighters. Many of them owned their own wagons and teams while others worked for merchants, who provided delivery service, or for some freight company. George T. Howard and Charles Ogden, who operated a teaming business from 1845 to 1860, are said to have had as many as 800 teams at one time.⁴ With oxen costing fifty dollars a yoke this represented quite an investment.

²F. L. Olmsted, A Journey through Texas, p. 246.
³V. Bracht, Texas in 1848, translated by C. F. Schmidt, p. 82.
⁴G. Reed, A History of the Texas Railroads, pp. 43-4.
Although there were no established freight rates they were rather uniform, subject to change in weather. DeCordova stated that the approximate rates in 1857 were about one cent per pound for each one hundred miles carried. For example the rate from Houston to Dallas was about three dollars per one hundred pounds. During the rainy season the rates were frequently doubled.\(^5\)

Passage over the roads in wet weather was all but impossible. Freighters often had to wait for days for the roads to dry. "For a period in 1858 roads leading from Lavaca to San Antonio were so bad that an empty stage coach could not go five miles without getting bogged."\(^6\)

Passenger transportation by stagecoach was inaugurated from Houston as early as 1839 or 1840, and by 1857 there was a network of stage lines from Galveston and Houston to nearby points and to the interior of the state. Some of the first stagecoaches were not much better than wagons.

When it rained, women passengers opened umbrellas, often to the discomfort of the men who received the drippings down their collars. If the stage bogged down in mud, even the dandies aboard, resplendent in patent leather shoes and velvet pantaloons, were expected to help push.\(^7\)

By 1850 the coaches, if not the roads, had improved as witnessed by the following description:

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\(^5\) J. DeCordova, \textit{Texas: Her Resources and Her Public Men}, p. 228.

\(^6\) R. N. Richardson, \textit{Texas the Lone Star State}, p. 214.

\(^7\) Writers' Project, \textit{Houston, A History and Guide}, pp. 139-140.
Messrs. Brown and Tarbox have completed another of their superior coaches, for the Houston and San Antonio Lines. It is christened the "General Taylor"... Its running gear is strong ash, the body and panels are of magnolia; its leather springs and its axles were forged in their own shop; the boxes were cast and polished at McGowen's furnace. ... The body is long, narrow and trim, giving ample room for three rows of passengers.  

Even though roads were dry more often than they were wet it was the undesirable features that spurred the people to improve their conditions. The early 1840s found the enterprising citizens of Houston building bridges across three of the bayous on roads leading out of the city. Some of the roads across the county were graded. The time involved in transporting the mails and freight between various places, especially between the capital at Austin and the coastal cities, caused a great deal of complaint. There were numerous proposals to alleviate this circumstance. In 1840 it was proposed that a turnpike be built from Houston to Austin and in 1841 a charter was granted to the Houston and Austin Turnpike Company for its construction. The company was unable to raise enough money to begin construction.  

In 1850 a number of men, primarily of Houston, obtained a charter under the name of the Brazos Plank Road. It was their plan to grade a road from Houston to some point on the

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Brazos River and then cover it with planks so that ox wagons and other vehicles could reach the city easily in all kinds of weather. Some twenty-three miles of road had been graded by the year 1852 but no planks were laid. Opposition by persons interested in the construction of a railroad, which was completed in 1853, caused abandonment of the plan.  

The coming of the railroads discouraged the building of any roads on any extensive scale. The first Congress of the Republic had placed the responsibility of building roads in the hands of the counties and there it remained until 1917 when the State Highway Commission was created. It was the advent of the automobile that brought about the renewed demand for more and better roads and bridges. The first horseless carriage appeared on the streets of Houston March 15, 1897. It was an electric carriage run by storage batteries. Gasoline powered automobiles made their appearance in the cities of the region about 1900.

Many of the roads of the area were paved with shell taken from the bays and bayous. Galveston was probably the first city of the region to make use of this material. Harris County boasted of some 300 miles of such road by

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10 S. C. Young, A Thumb-Nail History of the City of Houston, Texas, p. 65.

1913. The first concrete highway in Galveston County was a fifty-mile stretch between Galveston and Houston built at a cost of approximately $1,000,000. This road was completed in 1928.

With the development of highways and improved automotive vehicles there came into existence means of transportation which have played an important part in the development of the region; namely, buses and trucks. Makershift bus lines began operation as early as 1921. Freight truck lines came at a later date but have increased rapidly. Today motor buses and motor trucks serve all the cities of the region and carry a large percentage of the passengers and freight.

The newest means of transportation in the Gulf Coastal Prairie is by airplane. Like the automobile its development on an extensive scale was made possible by the invention of the gasoline engine and the discovery of large supplies of petroleum. One of the first airplane exhibitions took place in the region in Houston on February 18, 1910, "when more than 2,500 people paid a dollar each to watch a barnstorming French aviator, Louis Paulhan, take off and land several times." Commercial air transportation of passengers in

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15 Ibid., p. 147.
Texas and the Gulf Coastal Prairie was inaugurated in 1928 when Texas Air Transport began scheduled flights between Galveston and Fort Worth. Flights between Dallas and San Antonio were begun at the same time.  

Air mail service to the region was begun during the same year.

Seven of the eleven commercial air lines which operated in Texas as of 1949 served cities of the Gulf Coastal Prairie. Each of the seven maintain scheduled flights in and out of Houston, while the Beaumont-Port Arthur area is served by three lines, Galveston by two and Victoria by one. Commencing in 1946 three air lines began to operate international flights to and from Houston.

These include operation by Braniff to the principal capitals of South America via Havana and the Canal Zone; to the principal cities of the Caribbean islands and Venezuela by Chicago and Southern, and to Guatemala City via Mérida, Mexico, by Pan American.

To take care of this increased air traffic Houstonites voted a $6,000,000 bond issue to improve plant facilities of the airport. This includes a terminal building with facilities for loading and unloading thirty-five planes at one time.

17 Ibid.
18 "Houston Bids and Wins," The American City, LXII (March, 1947), 13.
The history of early railroad construction in the Gulf Coastal Prairie is in part a story of the struggle of different towns to gain control of a trade area. The first railroad in the region was not completed until 1853. However, prior to that time there were numerous plans and schemes for construction. The first charter for a railroad in the region appears to have been granted on May 24, 1838, to the Brazos and Galveston Railroad Company. The charter gave to the company permission to build a railroad, road, or canal, or combination thereof, from the main channel of Galveston Bay to the Brazos area. The plan never reached the construction stage.19

This effort on the part of Galveston did succeed in arousing the citizens of Houston, who on January 26, 1839, secured a charter under the name of Houston and Brazos Railroad Company to build a railroad from Houston to the Brazos River. A. C. Allen, one of the founders of Houston, was a leader in this venture. "A threatened Mexican invasion caused the enterprise to be abandoned."20

The first railroad to reach the construction stage was that of the Harrisburg Railroad and Trading Company. It was the plan of Andrew Briscoe of Harrisburg to build a railroad from that town to the Brazos area where settlement was most dense. Instead of asking for a charter he at first undertook

19 Reed, op. cit., pp. 30-31. 20 Ibid., p. 33.
by his own initiative and enterprise to build the road. In 1840 work was begun with several miles of roadbed being graded and ties secured. Briscoe decided to charter the road in 1841, nonetheless, work on the project had to be discontinued for financial reasons.  

Texas' first railroad, the second west of the Mississippi, came into existence as a result of the efforts of General Sidney Sherman. Sherman, also a citizen of Harrisburg, had been inspired by the efforts of Briscoe. In 1848 he secured a charter under the name of Harrisburg City Company, but after securing financial aid from citizens of Boston the company was reorganized and chartered as the Buffalo Bayou, Brazos, and Colorado Railroad. Construction was begun in 1852 and by 1860 it had been extended as far as Alleyton in Colorado County. The first twenty miles of the road was officially opened to service in September, 1853, with the locomotive "General Sherman" drawing several cars which appeared to have been built for trolleys. The biggest problem of this railroad was spanning the Brazos River near Richmond.

Financially unable to build a permanent span, the road rigged up a low water pontoon bridge, leaving fifty feet open in the middle for passing steamboats. This

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21 Ibid., pp. 36-38.
gap was closed by floating the necessary length of rail on a flatboat which was moved into place for the train crossing.22

This bridge was considered so unsafe that it was customary to stop the train before it reached the river and give the passengers the choice of taking their chances with the train or of getting off and taking the ferry.23 The Buffalo Bayou, Brazos, and Colorado Railroad later became a part of the Southern Pacific system.

The year 1853 marked the beginning of construction of Texas' second railroad, the Houston and Texas Central. It had formerly been chartered as the Galveston and Red River Railway Company with permission to build a railway from some point on Galveston Bay to a point on the Red River. Ebenezer Allen of Galveston was the chief promoter. Unable to get sufficient financial backing from citizens of that city he accepted the aid of Houston citizens. In accordance with their desires the Legislature on February 7, 1853, approved a change in the charter to permit the railroad to begin at Houston. Later the name was changed to Houston and Texas Central Railway Company. The leading Houston advocate of the railroad was Paul Bremond upon whose shoulders came to rest the responsibility of getting the road built. There

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23 Reed, *op. cit.*, p. 62.
were many difficulties to be overcome, the greatest of which were centered around finances. Only two miles of track were laid the first year. However, through perseverance the road was built as far as Millican, a distance of about eighty miles, by the end of 1860. It is interesting to note that there was strong opposition for a time to the building of this road by a number of the merchants of Houston, especially by the teamsters and by those advocating a plank road.

The chartering and construction of other railroads came thick and fast for a few years. In 1856 the citizens of Houston taxed themselves to build a railroad to tap the Buffalo Bayou, Brazos, and Colorado at Pierce Junction. Later this road was extended to Columbia and came to be known locally as the "sugar road" because it served that part of the state where so much sugar was produced.

Two promising towns on Matagorda Bay were Indianola and Lavacca. For a time Indianola ranked second only to Galveston in tonnage of goods exported and imported. The city of San Antonio had become interested in building a railroad to some point on the Gulf. It was decided to build the road to one of these ports and a branch to the other. Under a charter granted to the San Antonio and Mexican Gulf Railway work was

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25 Young, op. cit., pp. 67-68.
26 Reed, op. cit., p. 82.
begun at Lavaca in 1856 and by the end of the following year the road extended some five miles inland. In reporting on the railroad at this time the State Engineer stated:

The remarkable fact may be stated that this five miles of road terminating in the open prairie at a point remote from any settlement or public highway, has not only been of vast service to the people of Texas, but has actually overpaid running expenses. I . . . witnessed myself the tremendous business it was doing; the noise and bustle; the hundreds of wagons and teams and teamsters drawn to its present terminus or station in the prairie.27

The road was completed to Victoria and opened to traffic in April of 1861. In the meantime a line was built from Indianola to tap this railroad at a point several miles from Lavaca.

One of the most important railroads built before the Civil War was the Galveston, Houston, and Henderson Railroad. Construction began in 1856 and was completed in 1860, including the building of the first bridge across Galveston Bay. This railroad has

... the distinction of retaining its original charter name longer than any other railroad in Texas. There has been no extension or abandonment of any part of the line since it was completed, except a temporary extension on Galveston Island during the Civil War.28

The railroad drew the Henderson part of its name from its intention to build one branch of the road into that area.

27"Inventory of the County Archives of Texas, No. 29, Calhoun County," (Prepared by the Texas Historical Records Survey, 1941), p. 10. (Mimeographed.)

28Reed, op. cit., p. 75.
This was never done. Although Galveston's purpose in the construction of this road was to thwart the growing commercial importance of Houston it was supported by the investments of Houston business men.

The Texas and New Orleans Railroad was built in the year 1860 from Houston to Orange, Texas, a distance of 106 miles. A. M. Gentry, president of the company, was instrumental in getting the road built. Both Texas and Louisiana granted charters to the same company with the intent of connecting Houston and New Orleans. Although begun, the Louisiana branch of the road was not completed until after the Civil War. 29

The benefits derived by the people of Texas from the railroads are reflected in a statement written in 1857:

Until within about one year past, Texas has been confined its transportation to the use of the ox-wagon, upon the prairie, often submerged in water, and always a slow, difficult, uncertain and expensive method of carriage. Now her railroads penetrate the interior. Certainty as to time, and a great reduction in expense, are at once obtained; while in two hours a locomotive takes over fifty miles what a thousand ox-teams could not have taken in two weeks. ... That belt of coast prairie has been spanned by the railway; and the steam-engine does now in hours what it took oxen months to do. 30

Passenger fare on the railroads during this period was five cents a mile while freight rates were about one-half

29 Ibid., pp. 84-87.
30 Decordova, op. cit., p. 95.
cent per mile for each one hundred pounds. This compared to ten cents a mile by stagecoach which, like the rates of the freighter, sometimes doubled in wet weather.\footnote{Richardson, \textit{Texas the Lone Star State}, p. 216.}

During the period 1836-1861 eleven railroads were built in Texas. Ten were in operation when the Civil War began. Nine of these railroads were completely or partially within the Gulf Coastal Prairie. These railroads played an important role in the early part of the war. The Texas and New Orleans was of particular importance in transporting men and supplies toward the fighting fronts. The Galveston, Houston, and Henderson was used by troops in retaking Galveston after it had been captured by Union forces. However, before the war came to a close only two railroads, the H. \& T. C. and the G. H. \& H. were still in operation. Some had been abandoned while others had been torn up. On all of the railroads the equipment was almost, if not completely, worn out.\footnote{Reed, \textit{op. cit.}, pp. 125-27.}

One of the first railroads to be constructed following the close of the Civil War was the Gulf, Colorado, and Santa Fe. Sponsored primarily by citizens of Galveston this railroad might never have come into existence had it not been that Galveston's only rail outlet at that time passed through Houston. Each year there would be one or more yellow fever scares on the coast. When these occurred Houston would place
a quarantine on goods coming from Galveston. Citizens of that city came to believe that the purpose of the Houston quarantine was more to interfere with their trade than due to a fear of yellow fever. The course of the G. C. and S. F. was so planned that it not only by-passed Houston but Harris County as well. Construction began in 1875. The road was completed to Richmond in 1879; to Brenham, 126 miles, on August 1, 1880; and to Belton, about 226 miles on March 1, 1881. Other extensions were made later. On March 3, 1886 the G. C. & S. F. became a part of the Atchison, Topeka and Santa Fe system of which it is still a part.\(^{33}\)

The 1880s saw the construction of a railroad from San Antonio to Houston primarily through the efforts of one Uriah Lott, a well known railroad builder of South Texas. Lott lost control of the road in 1890, only one year after it had begun operation. This road was a part of the San Antonio and Aransas Pass system which was often referred to as the S. A. P.\(^{34}\)

In the Beaumont area a number of railroads were built around the turn of the century. "In 1895 Coleneol L. P. Featherstone built the Gulf and Interstate from Beaumont to Bolivar Point.\(^{35}\) In 1896 John Henry Kirby sponsored the


\(^{34}\) J. L. Allhands, Uriah Lott, pp. 68-69.

building of the Gulf, Beaumont, and Kansas City from Beaumont to Kirbyville in Jasper County. The primary objective of this road was to haul logs to the saw mills in Beaumont.\textsuperscript{36} The discovery of oil and development of oil fields in the area brought about the building of the Beaumont, Sour Lake, and Western Railroad from Beaumont to Sour Lake in Hardin County. This road, built in 1906, is today a part of the Gulf Coast lines.\textsuperscript{37}

Running north out of Port Arthur is the Kansas City Southern Railroad. Both the railroad and the city came into existence as a result of the ideas and efforts of Arthur Stillwell who gave his first name to the city.\textsuperscript{38} At the time the railroad was known as the Kansas City, Pittsburg, and Gulf. It was Stillwell’s plan to build this railroad from Kansas City to Shreveport, Louisiana, and utilize the Houston East and West Texas Railroad from that point to make connection with Houston and Galveston. In his autobiography Stillwell told why he changed his mind and built the railroad to an unpopulated spot on Sabine Lake.

An intuitive sense—or a hunch as I have chosen to call it, told me to abandon the entire project and look to a more northeasterly portion of the Texas coast for the end of our line to deep water. I did so and there occurred to me a picture of a city of 100,000 persons

\textsuperscript{36}\textit{Ibid.}, p. 93. \textsuperscript{37}\textit{Ibid.}, p. 94. \textsuperscript{38}Writers’ Project, \textit{Port Arthur}, p. 32.
on the north bank of Sabine Lake which could be connected with the Gulf by means of a canal about seven miles long. Here in this land locked harbor, safe from the most devastating storm the Gulf could produce, we would erect elevators and piers and create a port for the shipment of the famous export grain.39

Stillwell built his railroad to the present site of Port Arthur completing it in 1896. He lost control of the railroad in 1900, and at that time the name was changed to Kansas City Southern.

Today the Gulf Coastal Prairie is served by an integrated system of railroads. Each county has at least two lines serving it.

Two main railroads parallel the coast. The Missouri Pacific extends southwestward from Orange to Brownsville, only a few miles inland from the coast, while the Southern Pacific operates a parallel line about thirty miles farther inland. In addition to these coastal lines, the Kansas City Southern, the Southern Pacific, the Santa Fe, the Burlington, the Missouri Kansas and Texas, and other lines provide excellent rail contacts with inland areas.40

Competition by air lines and bus companies brought about improved railroad services and facilities by the mid 1930s. The first all-metal, diesel-powered streamlined train in Texas was the Sam Houston Zephyr which began service between Houston and Dallas over the tracks of the Burlington-Rock Island Railroad in 1936.41 The period since World War II

39Reed, op. cit., p. 434, quoting A. Stillwell, Memoirs.

40E. J. Foscue, "Industrialization of the Texas Gulf Coast Region," The Southwestern Social Science Quarterly, XXXI (June, 1950), p. 5.

41Writers' Project, Houston, A History and Guide, p. 149.
has seen a rapid conversion to diesel-powered units in both
freight and passenger service.

Water transportation has played a most important role
in the economic development of the Gulf Coastal Prairie and
of the state. To the Spaniard the Texas Coast with its
shallow bays and lagoons and long, almost flat sand bars,
with seldom a tree to be seen, appeared very uninviting and
was a place to be avoided. All of their communication with
the interior was by overland trails. The pirates under
Lafitte found this isolation rather to their liking, utiliz-
ing the area around Galveston Island until 1821 when the
United States Navy asked them to leave. The same year saw
the coming of the Anglo-Americans to Texas and with them be-
gan the utilization of the waterways of the region.

Many settlers came overland, others came by sea, while
all came to depend almost entirely upon water transportation
to get their goods to and from market. The increasing ton-
nage of their farm products and increasing need of supplies
from the outside world, together with the lack of good roads,
caused increased use of the rivers and the development of
ports. In the early days row boats and barges were used
even though they were too slow. Sails could not be used to
advantage although shallow draft sailing vessels did make
their way inland as far as Brazoria. For a time there was a regular line of schooners to New Orleans.\footnote{42}

Navigation of the inland waterways was handicapped not only by the lack of depth to the rivers but by bars found at the mouth of the rivers. The wind as well as the tide affected the depth of the water in the bays, as explained by Mary Austin Holley:

The effect of . . . winds upon the tide-water of the bays along the coast, is very perceptible. In Galveston bay a strong norther reduces the depth of water three or four feet, and keeps out the tide until it moderates. A southeast gale has a reverse effect. On Red Fish bar, which crosses that bay, during a strong norther, there are at times, but three and a half feet of water at high tide, but with a strong south-east wind, there are usually six feet, and sometimes seven. This observation will apply to all the bays of the coast.\footnote{43}

Although steamboats had been used earlier on the Rio Grande they were not introduced to this region until about 1830. The firm of McKinney and Williams began in 1831 to operate steamboats between Harrisburg and Brazoria. Later they extended operations up the Brazos as far as Richmond. Occasionally they operated as far as Groce's Landing near the present town of Hempstead. One of their boats, the Yellowstone, was there in 1836 and was used to carry General Sam Houston's army across the river in his retreat from

\footnote{42}{A. L. Allhands, \textit{Gringo Builders}, p. 219.}
\footnote{43}{M. A. Hatcher, \textit{Letters of an Early American Traveller, Mary Austin Holley, Her Life and Her Works, 1784-1846}, p. 164.}
Later, as she went down the river, the Mexicans tried to destroy her, but bales of cotton stacked high all around the decks served to protect her from damage. The first steamer on Galveston Bay was the Cayuga, a small river steamer chartered by the Harris brothers. In January of 1837 the steamer Laura made its way from Harrisburg up Buffalo Bayou to Houston. The voyage of twelve miles took three days as it was necessary to stop frequently and remove snags and other hindrances to navigation from the water. The boat did not travel at night.

Navigation of the Trinity began as early as 1843 when the Ellen Frankland "made a successful voyage up the . . . river, to a distance of between four and five hundred miles from its mouth." Captain Frankland, the owner of the steamer, believed that navigation was practicable to within sixty or seventy miles of the Red River. There were several steamers that operated on this river. Operations of great distances inland depended upon the stage of the water.

All of the large streams of the Gulf Coastal Prairie were utilized to some extent for navigation. Meager though it was in some instances it was very important to the people of the area concerned. On most of the streams side-wheelers

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44 Reed, op. cit., p. 6.
46 M. C. Houstoun, Texas and the Gulf of Mexico, II, 90.
were preferred to stern-wheel steamers because they could turn more sharply which was often necessary along some of the water courses.

Buffalo Bayou proved to be the most dependable stream for navigation in Texas. As both Houston and Galveston were "booming" the traffic between those two points was very heavy. In 1857 passenger fare between these two points was three dollars for cabin passage or a dollar and a half for deck passage. Before the Galveston, Houston, and Henderson Railroad brought an end to the steamboat passenger service some very nice ships were reported in operation.

During the latter years there were some magnificent steamboats engaged in the Houston-Galveston trade, the two most magnificent ones being the "Diana" and the "T. N. Bagby," sister boats which compared favorably with any of the famous Mississippi river boats. They were each 170 feet long, thirty-two feet beam and five feet hold and were furnished in the most luxurious manner. Each was a veritable floating palace.

As the size of ocean-going vessels increased and the commerce of the state expanded Texas ports found themselves more and more handicapped. Freight carried down stream to Galveston, or overland to Indianola and other ports, had to be lightered to ocean-going vessels lying off-shore. What some of the cities of the Gulf Coastal Prairie did to overcome this handicap is the story of the development of the

\[47\] DeCordova, op. cit., p. 223.
\[48\] Young, op. cit., pp. 76-77.
deep-water ports of Texas of which there are thirteen. Eight of them are in this region and the tonnage of cargo handled is more than 80 per cent of that of the state.⁴⁹

Active efforts of Galveston to become a deep water port date back to 1869 when the city constructed a pile of jetty from Fort Point for a mile into the Gulf. The purpose of this was to deepen the water by scour. In 1870 the federal government, for the first time, appropriated money for dredging. From time to time other aid was given or promised. The people of the West had much influence in aiding Galveston's cause. Their demand for a deep-water port caused the Congress in 1889 to authorize the creation of a board of engineers.

... to select in a most eligible place a location for a deep-water port on the Gulf of Mexico, providing a harbor sufficient to accommodate the largest ocean-going vessels, commensurate with the commercial and naval necessities of the country.⁵⁰

The board of engineers selected Galveston as that site and in 1890 the Congress appropriated $6,000,000 to carry out the plan of creating the channel by the building of jetties. Results of this project plus continued peace-meal work by the city gave the channel an overall depth of thirty feet with jetties extending eight to nine miles from the

⁵⁰ F. W. Johnson, op. cit., II, 693.
inner harbor to the sea. By 1927 the port had a thirty-five foot channel\textsuperscript{51} which is the prevailing depth today.

Houston became a deep-water port as the result of widening and deepening of Buffalo Bayou which is known today as the Houston Ship Channel. From the time of the founding of the city, Houston was interested in water transportation. The first steamboat up the Bayou to the town site, the Laura, was hired to make the trip by the Allens, founders of the city. Even though a promotion scheme the usability of the Bayou for navigation was soon proven.

By a city ordinance passed June 8, 1841, Houston declared herself to be a port.\textsuperscript{52} The following year the Congress of the Republic gave the city the right to remove obstructions from Buffalo Bayou and otherwise improve navigation. Some work of this sort was conducted. By an act of the Legislature in 1856 $300,000 was appropriated for work on the waterways of the state. Of this amount $22,725 was designated for improving navigation over Clopper's Point (Morgan's Point).\textsuperscript{53}

Charles Morgan is termed by many to be the founder of the Houston Ship Channel as it was he who showed Houston

\textsuperscript{51}Richardson, Texas the Lone Star State, p. 457.


\textsuperscript{53}F. W. Johnson, \textit{op. cit.}, I, 505-6.
what could be done. In 1847 Morgan gained control of much of the shipping between Texas and New Orleans. Following the Civil War he became dissatisfied with the rates and facilities being offered him at Galveston. After conferences with city officials failed to bring any relief he threatened to dig a channel through the bars of Galveston Bay and send his ships to Houston if his wishes were not complied with.

With his ultimatum turned down, Morgan turned immediately to Galveston Bay and Houston's Buffalo Bayou. He first purchased the City of Houston's interest in the Houston Direct Navigation Company, and put to work a large engineering force to deepen the channel across the bay and dredge a cut through the present Morgan's Point.54

A channel was not dredged all the way to Houston. Instead wharves were built at Clinton and a railroad was built to carry the goods the remainder of the way.

Finally on July 1, 1876, with the Morgan flag flying at top-gallant height, with shore crowds cheering and bands playing airs of the day, the good ship "Morgan" of 1,150 tons, length 210 feet, beam 34 feet, molded depth 18 feet, with Captain W. Thiessen in command, docked at Clinton landing. Thus was inaugurated the first of Houston's deep sea shipping.55

A survey of the water-way by the United States Engineers in 1871 marked the entry of the federal government into the picture. The following year a fourteen to eighteen foot channel was completed across Red Fish Bar. In 1899 the

54 J. A. Ziegler, Wave of the Gulf, p. 93.
55 L. N. Lyon, "Morgan—the Pioneer," Houston Port and City, X (November, 1932), 45.
Congress approved a project for a twenty-five foot channel from Bolivar Roads in Galveston Bay to the foot of Main Street in Houston. However, this was later amended to specify that a channel of only eighteen and one-half feet from Bolivar Roads to Harrisburg should be dug immediately. 56

Appropriations were thereafter made by Congress in such meager amounts that leaders of Houston realized that they must do something if they were to get any measurable results. A delegation was sent to Washington to propose that if the . . . national government would let a continuing contract for the twenty-five foot channel from Bolivar Roads to the Turning Basin, the taxpayers of Harris County would pay one-half of the construction cost, and would also provide adequate publicly owned water terminal facilities. 57

The Congress accepted this offer and on June 25, 1910, made an appropriation to complete the channel. It was completed in 1914 and opened to commerce in 1915. Further appropriations of money by the federal government have provided for increasing the depth and width of the channel. At present the forty-five mile long channel is 200 feet wide with a depth of thirty-four feet. The turning basin has a diameter of 1300 feet.

Port Arthur was the first of the cities in the Sabine-Neches area to have a deep-water port. The initial work on the channel was carried out by the Arthur Stillwell interests.

56 Farrar, op. cit., pp. 1-30. 57 Ibid.
Beginning shortly after the founding of the city in 1895 a canal eighteen or more feet in depth was dredged seven miles to the Gulf of Mexico. The canal was completed in 1899 at a cost of about $1,400,000. Citizens of Sabine Pass fought hard to keep the canal from being dug because they knew that it would hurt their shipping. When they secured injunctions against the Stillwell interests the latter group decided to dredge the canal through their own land instead of through Lake Sabine as previously planned. Through the combined efforts of the city and the federal government the canal has been enlarged to its present depth of thirty-four feet.

Shortly before the turn of the century the citizens of Beaumont began an agitation for government help to construct a deeper waterway. Dredging was done at the mouth of the Neches in 1880 and again in 1895 to secure a five foot deep channel but each time funds were exhausted before deep water in Sabine Lake was reached. In 1904 and 1905 the Congress appropriated a total of $598,000 for a channel paralleling the western borders of Sabine Lake, and extending north to Taylor's Bayou. This project was completed January 21, 1908.

The first Sabine-Neches Canal was fifteen miles long, nine feet deep, and 100 feet wide. The first deep-water vessel to reach Beaumont was the United States revenue cutter Windom, while the purchase of the Norwegian steamship Nicaragua by Capt. W. C. Tyrrell

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58 Writers' Project, Port Arthur, pp. 41-42.
gave the new port its first commercially-owned ship. Soon the city voted a $50,000 bond issue for wharves.\footnote{Writers' Project, Beaumont, A Guide to the City and Its Environ, p. 115.}

By approval of an act of the legislature in February, 1909 the people of Beaumont created a navigation district. Then, following the example of Houston, Congress was asked for further appropriations with the provision that Beaumont furnish an equal amount. The result was a federal appropriation of $4,980,000 for deepening the channel and improving the river. This gave to the city in 1916 a twenty-five foot channel and turning basin.\footnote{Ibid., p. 117.} Subsequent projects have given the channel a controlling depth of thirty-four feet.

Other deep-water ports of the Gulf Coastal Prairie are Orange, Sabine Pass, Texas City, and Freeport. Facilities at Orange and Sabine Pass were developed as a part of the Sabine-Neches system. Initial development of the port of Texas City was undertaken by private enterprise during 1895-1896, but was taken over by the United States government in 1899.\footnote{M. P. Fox, Report upon the Improvement of Rivers and Harbors in the Galveston, Texas, District, Extract from the Annual Report of the Chief of Engineers, 1932, p. 962.} Freeport, near the mouth of the Brazos River, became a deep-water port in 1913. Silting of the channel was a major problem which was not solved until about 1933. In 1925 Brazoria County created a navigation district. With

\footnote{Writers' Project, Beaumont, A Guide to the City and Its Environ, p. 115.}
\footnote{Ibid., p. 117.}
\footnote{M. P. Fox, Report upon the Improvement of Rivers and Harbors in the Galveston, Texas, District, Extract from the Annual Report of the Chief of Engineers, 1932, p. 962.}
$1,000,000 voted in bonds, and a congressional appropriation of $500,000, a diversion channel was dug so that the water of the river flowed into the Gulf at a point some five miles from its previous mouth. This made possible the use of the old channel as a canal with a minimum of silt deposit.\textsuperscript{63}

The most interesting and one of the most important waterways on the Gulf coast is the Intracoastal Canal. This canal which stretches from Brownsville, Texas, to Apalachee Bay, Florida, 1,116 miles, had its last link completed in June, 1949.\textsuperscript{64} The idea of connecting the numerous inlets and bays along the coast was not a new one but the first concerted effort toward that end was in 1905 when C. S. E. Holland and other interested citizens of Victoria called a meeting in that city for all parties interested in building an intercoastal canal. At this meeting the Interstate Inland Waterway League of Louisiana and Texas was organized. Later the name of the organization was changed to Intracoastal Canal Association. They set as their goal the "construction of a canal one hundred feet wide and nine feet deep along the Gulf Coast from the Mississippi River to the Rio Grande."\textsuperscript{65}

Included among the members of the organizing group were

\begin{itemize}
\item \textsuperscript{63} C. M. Hammond, "Freeport and Its Sulphur," The Texas Weekly, IX (August 12, 1933), 9.
\item \textsuperscript{64} "The Last Link," Time, LIII (June 27, 1949), 80.
\item \textsuperscript{65} B. Mooney, 75 Years in Victoria, p. 22.
\end{itemize}
J. M. Pickering and L. M. Stevens of Victoria and John Nance Garner, then Congressman from Texas.

Some success came almost immediately. The River and Harbor Act of 1907 authorized the dredging of channels five feet deep and forty feet wide, from Galveston Bay to the Brazos River, and from Pass Cavallo to Aransas Pass. Later these channels were connected. Legislation in 1925 and 1927 provided for a waterway nine feet deep and 100 feet wide from Corpus Christi to the mouth of the Mississippi River. This channel was completed in 1934. 66

An emergency measure for enlarging and completing the Gulf Intercoastal Waterway canal project was passed by Congress in July, 1942. The completed channel has a minimum depth of twelve feet and width of 125 feet. 67 During World War II the canal proved very valuable.

While tankers were being sunk by submarines within sight of the coast, the canal barges were safe from attack. That boomed shipping on the canal from 7,000,000 tons (prewar) to a peak of 17,500,000 tons in 1944. There has been little tapering off since. 68

All ports of Texas are connected to this waterway.

For many years Galveston was the leading port of Texas. The acquisition of deep-water facilities about the turn of

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68 "The Last Link," op. cit., p. 82.
the century caused it to grow rapidly until 1912-1913 at which time it became, according to the combined value of exports and imports, the second largest port of the United States, a rank which it held for a number of years. With the development of other ports following World War I Galveston's supremacy began to be challenged. Statistics for the year 1935 show that Houston was the first among the ports of Texas, on the basis of tonnage, and fourth in the United States. By 1940 Houston was the third ranking port of the United States while in 1950 she was in second place with an estimated 12,000,000 tons of shipping valued at over $1,164,000,000. This is an all time high record for the port which has shown an increase in tonnage year after year. According to tonnage statistics for 1947 the ports of the Gulf Coast of Prairie were ranked in the order listed below: Houston, 34,192,143 tons; Beaumont, 23,919,540 tons; Port Arthur, 23,392,655 tons; Texas City, 10,083,460 tons, Galveston, 6,570,287 tons; Freeport, 744,565 tons; Orange, 268,558 tons; and Sabine Pass, 257,709 tons. Port Lavaca, which

70 "Houston Ranks As a Major Port of the United States," The Houston Port Book, XIV (May, 1936), 35.
71 "1950: Record Tonnage Year," The Houston Port Book, XXIX (April, 1951), 23.
handles barge traffic exclusively, moved 294,158 tons of cargo.\textsuperscript{72}

\textsuperscript{72}Texas Almanac 1949-1950, p. 348.
CHAPTER V

DEVELOPMENT OF MINERAL RESOURCES

The commanding position which mineral resources hold in the development of the Gulf Coastal Prairie is one that has been attained in the last half century. Emphasis herein can be placed only upon the development of those resources which have affected the economy of the region in the largest measure.

In the Gulf Coastal Prairie can be found the following minerals: oil and gas, sulphur, oyster shells, sand, gravel, burning clay, cement material, gypsum, lime material salt, magnesium salts, bromine, and residual ironstone pebbles. Although all of these minerals are now being produced, or have been previously produced, only a part of them have been developed to any appreciable extent. Oil, natural gas, and sulphur have been most important. Just how important is indicated by the taxes paid by these interests. For the year 1947 the percentage of the total county and state ad valorem taxes levied against oil and gas producing properties ran from 3.2 per cent in Orange County to 67.4 per cent in Chambers County. For at least five of the counties the amount was 49.3 per cent or more. This calculation does not include
taxes levied against petroleum properties such as refineries, pumping stations and pipe lines.\(^1\)

Oil and gas fields found in this region have been characterized by certain geological structures of the earth which are described as follows:

The City of Houston in Harris County is located near the center of a region of the Coastal Plain of Texas that is characterized structurally by the presence of many salt domes and other structures related to salt movement in the subsurface. The salt domes are due to large plugs of salt that have been forced up through overlying strata from subterranean salt beds, causing folding and faulting of the surrounding formations. Other large structures often covering an area several miles in diameter are thought to be due to deeply buried salt masses. Structurally the salt dome region is a part of the Gulf of Mexico geosyncline. Regionally the formations dip and thicken toward the present coast line. The formations known to contain oil and gas deposits are all Cenozoic in age. Small blocks of Cretaceous rocks which underlie the Cenozoic are encountered in some of the salt domes, having been carried upward by the salt mass.\(^2\)

It is to be noted that salt dome structures are considered to offer excellent opportunities for the presence of oil and gas reservoirs.

Sands in the formation pierced by the salt are pushed or dragged upward, forming traps around the flanks of the dome. Sands in the uplifted but unpierced formation above the salt masses form typical domal traps. A cap

\(^1\)"County and State Ad Valorem Taxes Levied in 1947 in 100 Producing Counties," *Texas Oil and Gas* 1948, pp. 16-7.

rock which has formed directly on top of the salt, consisting mostly of anhydrite, may also act as a petroleum reservoir. 3

Written records of the presence of petroleum and its use in America date back to 1543. In that year the survivors of the De Soto expedition constructed some crude boats and journeyed down the Mississippi and along the Gulf coast in their attempt to reach Mexico.

The record of this expedition, published at Evora, Portugal, fourteen years later, tells how "The vessels came together in a creek, where lay the two brigantines that preceded them." On the water, floating about the ships, was a dark scum, which the Spaniards called "coco." Since it was like the pitch which they had used in Spain to caulk their ships, they "payed the bottoms of their vessels with it." 4

Just where they landed in search of water is not known but "based on the log of their trip . . . and . . . upon description of arms of the sea, days of sailing time, etc., it was unquestionably between Sabine Pass and High Island," 5 in Galveston County.

The Indians had long known of the oil seeps at Damon Mound, Sour Lake, Saratoga and a number of other places. They also knew of springs of sour water caused by the bubbling of gas through them. Having learned of the medicinal

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3Ibid., p. 131.
4C. C. Rister, Oil! Titan of the Southwest, p. 3.
5C. A. Warner, Texas Oil and Gas since 1543, p. 1.
6High Island is the present site of an oil field.
values of these strange products of nature they traveled for many miles to these places to treat themselves for battle wounds and skin diseases. When the Spaniards, and later the Anglo-Americans, came into Texas they too learned of the seeps and springs. They made use of the products thereof not only for medicines, but to grease the wheels of their carts and wagons. Sour Lake, Hardin County, which is on the margin of this region, became a health resort, but because of its inaccessibility it was not visited by a great many people. Frederick Olmsted described this locality after a visit in 1855.

There are two springs of cold, clear, acid, slightly astringent water, boiling with the outburst of an inflammable gas, having a slight odor of sulphuretted hydrogen. The overflow forms a pond of an acre in extent, which gives to the locality its name of "Sour Lake." Upon the banks and bottom is a deposit of sulphur.

The Drake discovery well in Pennsylvania resulted in an increased interest in the search for oil in Texas. In 1866, Richard (Dick) Dowling, who had a partnership with John M. Pennerty of St. Louis, leased land in Harris County for the purpose of developing the mineral resources. Whether or not any wells were dug by this party is not known.

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8 F. L. Olmsted, A Journey through Texas, p. 375.
The first attempt in Texas and the Gulf Coastal Prairie to utilize geology in the search for oil came in 1892. Prior to this time most of the wells dug in Texas had been at places where oil seeps were found. Pattillo Higgins was convinced that oil might be found south of Beaumont at a place called "Big Hill" (Spindletop). This so-called hill was really a mound near which were seeps of gas and mineralized water. The efforts of Higgins to get the mound explored resulted in the formation, on August 24, 1892, of the Gladys City Oil, Gas and Manufacturing Company with George W. Carroll, president, and himself as treasurer and manager. In 1893 a contract for the drilling of a well was let to W. B. Looney of Dallas, who in turn sublet the contract to Walter B. Sharp. After drilling to a depth of 418 feet the well was abandoned. The only positive result was a showing of gas at sixty feet. A second and a third were drilled in 1895 and 1896 but without success.\footnote{Rister, op. cit., pp. 51-53.}

The fourth contract for the drilling of wells at Spindletop was let to A. F. Lucas, a mining engineer of Washington, D. C., on June 20, 1899. The contract called for the drilling of two wells, the first of which was abandoned at 575 feet after showings of gas and oil. The Hamill brothers, who had been successful in bringing in wells at Corsicana,
were contracted by Lucas for the drilling of the second well. It was spudded in on October 27, 1900.

Drilling had progressed to a depth of 1,160 feet, and oil had already been noticed on the ditch when operations were shut down on January 10, 1901, to change bits. About 700 feet of the drill pipe had been lowered back into the hole when the well broke loose at 10:30 in the morning. The 4-inch drill pipe, swivels, blocks, and tackle were all blown up through the derrick, followed by the drilling fluid, mud, sand, and rocks, and then a strong gas eruption and a solid column of oil extending far above the top of the derrick. The Spindletop field had been discovered. 11

The gusher flowed at an estimated rate of 75,000 barrels every twenty-four hours. While efforts were being made to bring the well under control earthen levees were built around the derrick to hold the oil. In a short time this lake covered several hundreds of acres and probably contained some 240,000 or more barrels of oil. Later, after the gusher had been brought under control and precautions taken to protect it, the oil in the lake caught fire and burned.

The results of the "blowing in" of the Lucas well were immediate and far reaching. Florence Stratton described the effects upon Beaumont.

In the twinkling of an eye, Beaumont, the slow-moving, quiet little sawmill town of 9000 people was converted into a seething, fighting, shouting mob of 15,000 money-mad adventurers, each striving for a share in the hitherto undreamed-of wealth that lay beneath the uninviting, barren surface of Spindletop. The bringing in of the Lucas gusher on January 10, 1901, was responsible, raising the curtain upon one of the

greatest commercial and speculative dramas in the history of the development of the country.\textsuperscript{12} By the end of the year, 1901, a total of 166 wells had been drilled in the Spindletop field, only twenty-eight of them being abandoned as unsuccessful.\textsuperscript{13} Within a short time literally hundreds of oil companies were formed for the purpose of speculating in the search for oil. Spindletop was proof that the salt dome structures might contain oil. Throughout the region searches for the mound-like areas similar to that at Beaumont were conducted. Lucas is reported as having said, "I am going to punch a hole in every pimple on the Gulf Coast."\textsuperscript{14} A great many wells were drilled but only a few persons met with the success they hoped for.

Texas' total production of oil in 1900 was some 836,000 forty-two gallon barrels which came principally from the Corsicana field. During the year 1901 the state produced 4,394,000 barrels, the largest part of which came from Spindletop.\textsuperscript{15} By 1925 that field had produced a total of 48,782,604 barrels of oil, but in that year production was only 428,873 barrels. The sinking of deeper wells during 1925 and subsequent years resulted in new discoveries.

\textsuperscript{13}Warner, \textit{op. cit.}, p. 86.
\textsuperscript{14}W. Haynes, The Stone that Burns, p. 50.
Production increased and an all-time high of 20,751,000 barrels were produced from Spindletop in 1927.\textsuperscript{16}

The next discovery of importance in the Gulf Coastal Prairie was the Humble field of Harris County. Gas seepages had brought about the unsuccessful drilling of a well in the fall of 1902. Other tests followed. In January, 1905, the No. 2 Beatty well was brought in with an initial production of 8,500 barrels of oil per day from a depth of 700 feet. Development of this field was rapid with a production of more than 90,000 barrels per day being attained during the first year. Although there was a decline in production after the first few months the field proved in time to be one of the major producers of the region.

Harris County's second important field was brought in at Goose Creek on June 2, 1908. This field did not prove to be very important for a number of years. Initial production of the first well was only thirty barrels per day. Eight years later an 8,000 barrel-per-day well was completed on a site near the first well, but at a depth of 2,017 feet instead of the 1600 foot level. Although production of the deeper well declined after a short period, it led to an intensive development of the field.\textsuperscript{17}

\textsuperscript{16} Rister, \textit{op. cit.}, pp. 226, 228.

\textsuperscript{17} Warner, \textit{op. cit.}, pp. 196, 199.
The third major field to be discovered in Harris County came in July 10, 1937, near Webster, in the southeastern part of the county. This field proved to be the county's largest producer. (See Table 3.)

The year 1913 saw the discovery of the first fields in Orange and Galveston counties. The first well in Orange County held the distinction, at the time, of being the deepest producing oil well in Texas. Its depth was 3,128 feet. Depth of the oil sands hindered the rapid development of this field. Galveston County's first oil field was brought in by the Patton Oil Company on High Island at a depth of 158 feet. The field in time covered an area of about 150 acres. 18

Drilling on the site of the West Columbia field, Brazoria County, dates back to 1901 when the first test well was blown out by a gas pocket and abandoned. The second test resulted in a 1,000 barrels per day well which soon declined to such a point that it did not pay to operate. Continued efforts in the area met with ill-success until September 7, 1917, when the Tyndall-Wyoming Oil Company completed its No. 1 Hogg as a small producer. Development of the field during 1918, at the 2,800 foot depth, resulted in a production of 119,100 barrels of oil by the end of the year. During 1920 the Texas Company completed one well which "produced

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approximately 1,275,000 barrels of oil, valued at about
$3,825,000, during the first 76 days of its productive life."\(^{19}\)

The presence of gas was observed in a shallow water well
being dug in Chambers County in 1889. After the success at
Spindletop a number of efforts were made to discover oil in
this area. However, it was not until 1916 that a producing
well was drilled. Even though development was relatively
slow until 1926 the field proved to be one of the larger
producers of the state.\(^{20}\)

Some of the fields which have been discovered and devel-
oped in more recent years have proved the most important from
the production standpoint. Among these are Old Ocean, Bra-
zoria County; Hastings, Galveston County; and Anahuac in
Chambers County. The first of these was brought in on Novem-
ber 8, 1934. Oil zones in this field have been found at
depths of 10,600 feet.\(^{21}\) The Hastings field, discovered on
December 23, 1934, proved to be one of the most rapidly de-
veloped, having more than 450 producing wells three years
later.\(^{22}\) The Humble Oil and Refining Company brought in the
first well in the Anahuac field on March 16, 1935. With the
close of the year 1935, oil was being produced in all coun-
ties of the Gulf Coastal Prairie. In December of 1937 there

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\(^{19}\) Warner, *op. cit.*, pp. 200-201.

\(^{20}\) Ibid., pp. 201-202.

\(^{21}\) Rister, *op. cit.*, pp. 230-1.

\(^{22}\) Ibid.
were eighty-one oil fields in the region with a total of 3,659 producing wells.\textsuperscript{23}

One of the most recent developments in the search for oil is the drilling of wells on the Continental Shelf in the Gulf of Mexico. As of October 1, 1948, oil was being produced at only one place off Texas' shores, that being in the vicinity of High Island. However, much exploratory work had been done and drilling was under way at twenty-one other locations. Most of the leases held were located between Matagorda Bay and High Island.\textsuperscript{24}

Statistical information for Table 3, showing the major oil fields of the Gulf Coastal Prairie, is taken from \textit{Texas Oil and Gas 1951}, page 21, published by the Texas Mid-Continent Oil and Gas Association, Dallas, Texas. This publication lists fifty-two major fields for the state. Table 4 is a compilation of data from \textit{Texas Oil and Gas 1948}, pages 7-9, and \textit{Texas Oil and Gas 1951}, pages 22-23. In studying these charts it is of interest to note that the total oil production for the state in 1949 was 743,990,000 barrels while the total cumulative production for the state to January 1, 1948, was 11,244,653,000 barrels.

\textsuperscript{23}Warner, \textit{op. cit.}, pp. 218-19, 305-7.

\textsuperscript{24}"Texas Oil Frontier in Gulf," \textit{Texas Oil and Gas 1948}, pp. 40-1.
### TABLE 3

MAJOR OIL FIELDS IN THE GULF COASTAL PRAIRIE*

<table>
<thead>
<tr>
<th>Field</th>
<th>County</th>
<th>Discovery Date</th>
<th>Cumulative Production to January 1, 1950 (Barrels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spindletop</td>
<td>Jefferson</td>
<td>1901</td>
<td>129,408,000</td>
</tr>
<tr>
<td>West Columbia</td>
<td>Brazoria</td>
<td>1902</td>
<td>108,409,000</td>
</tr>
<tr>
<td>Humble</td>
<td>Harris</td>
<td>1905</td>
<td>133,994,000</td>
</tr>
<tr>
<td>Goose Creek</td>
<td>Harris</td>
<td>1908</td>
<td>83,731,000</td>
</tr>
<tr>
<td>Barber's Hill</td>
<td>Chambers</td>
<td>1916</td>
<td>89,220,000</td>
</tr>
<tr>
<td>Hastings</td>
<td>Brazoria</td>
<td>1934</td>
<td>183,214,000</td>
</tr>
<tr>
<td>Old Ocean</td>
<td>Brazoria</td>
<td>1934</td>
<td>54,101,000</td>
</tr>
<tr>
<td>Anahuac</td>
<td>Chambers</td>
<td>1935</td>
<td>94,251,000</td>
</tr>
<tr>
<td>Webster</td>
<td>Harris</td>
<td>1937</td>
<td>138,782,000</td>
</tr>
<tr>
<td>West Ranch</td>
<td>Jackson</td>
<td>1938</td>
<td>59,371,000</td>
</tr>
</tbody>
</table>

*A field is classified as a major field only if it has produced 100,000,000 or more barrels of oil; or if its potential production is that great.

Table 3 has shown the cumulative production from the date of discovery to January 1, 1950 for the major oil fields in the Gulf Coastal Prairie.

Table 4 shows the cumulative production in barrels from the date of discovery to January 1, 1948 and the total production by counties for 1949.
<table>
<thead>
<tr>
<th>County</th>
<th>Discovery Date</th>
<th>Production for 1949 (Barrels)</th>
<th>Cumulative Production to January 1, 1948 (Barrels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazoria</td>
<td>1902</td>
<td>26,595,053</td>
<td>343,030,726</td>
</tr>
<tr>
<td>Calhoun</td>
<td>1935</td>
<td>1,812,793</td>
<td>20,396,009</td>
</tr>
<tr>
<td>Chambers</td>
<td>1916</td>
<td>17,334,607</td>
<td>220,781,995</td>
</tr>
<tr>
<td>Fort Bend</td>
<td>1919</td>
<td>13,814,637</td>
<td>178,034,133</td>
</tr>
<tr>
<td>Galveston</td>
<td>1922</td>
<td>7,393,761</td>
<td>77,035,306</td>
</tr>
<tr>
<td>Harris</td>
<td>1905</td>
<td>25,515,631</td>
<td>448,274,527</td>
</tr>
<tr>
<td>Jackson</td>
<td>1934</td>
<td>10,349,030</td>
<td>91,478,764</td>
</tr>
<tr>
<td>Jefferson</td>
<td>1901</td>
<td>7,140,137</td>
<td>205,264,489</td>
</tr>
<tr>
<td>Matagorda</td>
<td>1904</td>
<td>5,670,287</td>
<td>42,000,148</td>
</tr>
<tr>
<td>Orange</td>
<td>1913</td>
<td>1,626,315</td>
<td>47,895,589</td>
</tr>
<tr>
<td>Victoria</td>
<td>1931</td>
<td>6,492,413</td>
<td>56,173,658</td>
</tr>
<tr>
<td>Waller</td>
<td>1934</td>
<td>406,651</td>
<td>4,269,597</td>
</tr>
<tr>
<td>Wharton</td>
<td>1925</td>
<td>6,812,217</td>
<td>73,861,239</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>....</strong></td>
<td><strong>111,393,532</strong></td>
<td><strong>1,808,496,180</strong></td>
</tr>
</tbody>
</table>
The discovery and development of natural gas fields in the Gulf Coastal Prairie was retarded for many years. Oil producers usually considered the gas a nuisance as well as dangerous. It was something that was incidental to the production of oil. The development of the Spindletop field was accompanied by the discovery of appreciable quantities of gas.

The presence of so cheap and convenient a fuel aroused the imagination of local capitalists. A gas company was accordingly formed in 1901 to supply the city of Beaumont with natural gas from the new field, but the project was doomed to failure. The pressure in the wells declined rapidly, and, as the volume of gas was not sufficient to justify the expenditure required, the project was abandoned. 25

Similar misfortune met other groups. Some of the gas had a high sulphur content and was injurious to humans and animals. Operators came to the conclusion that it would not pay to attempt to pipe and sell the gas. The result was that gas was piped into the cities of the Gulf Coastal Prairie from other parts of the state. 26 Nonetheless, later discoveries made within the region proved it to have a large reserve of natural gas, perhaps the largest in the state. There are numerous gas fields in the region the largest of which are Katy and Old Ocean. The Katy field is estimated to have a recoverable reserve of six trillion cubic feet of

25 Warner, op. cit., p. 46.
26 Ibid., p. 215.
gas while estimates for Old Ocean run as high as five trillion cubic feet. In 1942 the region had more than 200 producing wells and produced about 12 per cent of the total production of the state.  

There were no refineries in the Gulf Coastal area until after the Spindletop field was brought in. The Guffey Oil Company built the first refinery in the area at Port Arthur, beginning construction July 13, 1901. In November of the same year the Guffey Company was merged with the holdings of Andrew Mellon to form the Gulf Oil Corporation. The Texas Company also traces its origin to the Spindletop area. In 1902 J. S. Cullinan and ex-governor Hogg, with associates from New York, Chicago, Dallas, and Beaumont organized the company. Other refining companies formed at this time were the Gulf Refining Company, the Houston Oil Company of Texas, and the Burt Refining Company. The latter, which was the first refinery in Beaumont, was acquired by the Magnolia Petroleum Company in April, 1911.  

The products of these first refineries were few in number, the chief being kerosene which frequently amounted to

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28 Ibid., p. 160.
29 Dallas Morning News, January 7, 1951, Section 2, p. 5.
30 Warner, op. cit., p. 46.
80 per cent of the crude. Gasoline for the most part had only a nuisance value since the automobile had not yet created any great demand. In contrast, today's refineries produce an estimated 2600 individual products. 31

There were eleven refineries in Texas by 1912. Eight of them were in the Gulf Coastal Prairie and had a "total daily capacity of 90,000 barrels of crude, or 90% of the total for Texas." 32 With the discovery and development of oil fields in other areas more refineries were constructed. The first refinery in the Galveston Bay area was built by the Pierce Oil Corporation at Texas City in 1911. Opening of Houston's deep-water channel in 1914 led to construction of refineries in that area so that by 1923 seven were in operation. At the same time the Beaumont-Fort Arthur area, with six large refineries, was the nation's greatest refining center with a total combined daily capacity of 365,000 barrels. 33 The Humble Oil and Refining Company was formed March 1, 1917, and began construction of its first refinery at Baytown in 1919. 34 Beginning with a capacity of 10,000 barrels of crude oil per day it grew to an 180,000-barrel

31 Egloff, op. cit., p. 4.
32 Warner, op. cit., p. 196.
33 Rister, op. cit., p. 230.
capacity refinery by 1946, the largest in the region.\(^{35}\) The development of this refinery led to the growth of the cities of Pelly, Baytown, and Goose Creek.

Growth of the refining industry was more or less continuous during the 1920's and 1930's along with the development of the automobile and airplane. The depression of the 1930's slowed up but did not stop growth. World War II brought an unprecedented development to the industry. Huge quantities of gasoline and oil were needed to prosecute the war. New refineries were constructed while others increased their production capacity. In 1946 the Gulf Coastal Prairie had only twenty-two of the ninety-six refineries in the state, but had a crude oil refining capacity of 1,103,200 barrels compared with the state total of 1,496,215 barrels.\(^ {36}\)

The post war period saw continued growth of the industry with the Houston area as the center of activity. \textit{Fortune} magazine described her importance as follows:

> Within the city limits are more oil companies and allied industries than in any other community anywhere. In the city and environs there are fifteen oil refineries with a daily crude capacity of 800,000 barrels.\(^ {37}\)

Although the Sabine-Naches area had less refineries most of them were large. In 1949 six of them were "producing


\(^{36}\) \textit{Ibid.}, pp. 9-14.

16 per cent of U. S. and 10 per cent of the world's refined products.\footnote{Ibid., p. 100.}

Hand in hand with the development of refineries went the development of means of transporting the oil. Pipe lines proved the most effective means of getting the crude oil from the fields to the refineries or to the loading docks. By January, 1902, three pipe lines had been laid, two from Spindletop to Port Arthur, a distance of nineteen miles, and one from Spindletop to Sabine, a distance of twenty-four miles.\footnote{Rister, op. cit., p. 63.} In time pipe lines brought in oil from other producing areas to the refineries of this region. A brief description of the extensive development is given by Warner: \footnote{Warner, op. cit., p. 216.}

A large amount of pipe line construction has been necessary in the development of this district to furnish transportation facilities for the oil and gas produced. The building of oil pipe lines has been almost continuous since the discovery of the first fields, until there is now an ample network of pipe lines conveying oil from all of the fields to various refineries and to storage facilities along the coast for coastwise and export shipment.

During the second world war, when there was a vital need of oil and oil products on the east coast of the United States, two large pipe lines were laid from points in Texas to that area. One of these, a twenty-inch line called the "Little Big Inch," had its terminus at Beaumont. The work of laying
this line began April 23, 1943, and was completed in January, 1944. The line ran from Beaumont via Norris City, Illinois, to Linden, New Jersey, a distance of 1,475 miles. The line was used primarily to carry refined products of which it could handle more than 200,000 barrels per day. 41

Railway and water transportation have played an important role in the transporting of petroleum products to distant markets. Special tank cars were developed for rail transportation. However, the cheaper water transportation was used whenever available. "Movement of oil by water began in 1902 when the tanker Atlas left Port Arthur with a cargo of Spindletop crude oil." 42 By the following year crude oil shipments amounted to more than 8,000,000 barrels. With the development of the intercoastal waterways barges came to be used extensively. A large percentage of the tonnage shipped from the ports of the region was comprised of oil and oil products. In 1949 it was estimated that 60 percent of the shipments from the Sabine-Neches district fell in this category. 43 More than 100 tanker and tanker barge lines were serving the ports of this region during 1950. 44

41 F. Simpich, "The Yield of Texas," National Geographic, LXXXVII (February, 1945), 164.
44 "Shipping Services," Houston Port Book, XXIX (April, 1951), 45.
The mineral resource which ranks third in importance in the Gulf Coastal Prairie is sulphur. The presence of sulphur on the Trinity River was mentioned in the writings of Stephen Austin about 1830. In 1857 F. L. Olmstead wrote of having seen some at Sour Lake. However, no deposits were discovered until 1904, and they, like natural gas, were incidental to the search for oil. The initial discoveries of sulphur were made by Captain Lucas. In his search for further deposits of oil he drilled two wells at Bryan Mound in 1902 and several others at Damon Mound, Brazoria County. As no oil was found, the fields were abandoned and leases allowed to expire. Little attention was paid to the possibilities for sulphur as there was no successful means of mining it from the salt dome formations. During this period, however, the Frasch method of mining was being perfected. Herman Frasch, developed the method of melting the sulphur in its underground deposit and forcing it to the surface with compressed air. He was associated with the Union Sulphur Company in Louisiana. When his patents began to expire about 1912 other companies were organized to engage in sulphur mining.

The first Texas production of sulphur was at Bryan Mound by the Freeport Sulphur Company. Eric F. Swenson and George

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Hamman were instrumental in getting this operation under way in 1912. There was no substantial production until 1916. The first world war, which brought the threat of a shortage of sulphur because of lack of shipping space, stimulated expansion of the industry. Explorations for oil at Big Hill in Matagorda County resulted in discovery of recoverable deposits of sulphur which proved richer than those at Bryan Mound. In 1918 Bernard M. Baruch, Seeley W. Mudd and others formed the Texas Gulf Sulphur Company to mine this deposit. Construction of a 11,000 horsepower plant was started in July, 1918, and the first production was begun in March of the following year. 47

The year 1930 found four companies producing sulphur in the Gulf Coastal Prairie. In that year Texas produced 82 percent of the world's output of sulphur. 48 From 1924, when Louisiana's largest deposit was exhausted, until 1932 and 1933, when new fields were discovered, Texas produced practically all of the sulphur mined in the United States. 49

The 3,736,150 long tons of sulphur produced in the Gulf Coastal Prairie during 1943 came from five mines in four

49 A small percentage of this was produced in Duval County which is not in the Gulf Coastal Prairie.
counties.\textsuperscript{50} They were as follows: Texas Gulf Sulphur Company at Newgulf, Wharton County; Freeport Sulphur Company at Hoskins Mound, Brazoria County; Duval Texas Sulphur Company at Orchard, Fort Bend County; and the Jefferson Lake Sulphur Company at Long Point, Fort Bend County and at Clemons Dome, Brazoria County.\textsuperscript{51} Largest production was at Newgulf where the Texas Gulf Sulphur Company produced 3,065,602 long tons of sulphur. The second largest producer was the Freeport Sulphur Company. It is of interest to note that the original mines of all of the companies now operating in Texas have been abandoned. Bryan Mound was abandoned September 30, 1935, after having produced a total of 5,000,000 long tons of sulphur. The Big Hill dome at Gulf, Texas, was abandoned August 10, 1936, with a total production record of 12,350,000 long tons.\textsuperscript{52} The original mines of the other two companies were not in this region. The largest sulphur deposit thus far discovered and mined is Boling Dome (Newgulf). Before mining began there in 1929 the total sulphur in the deposit was estimated to be more than 46,000,000 tons.

About 80 per cent of Texas sulphur is shipped out of state. Sulphur from Boling Dome is carried by railroad gondola cars to Galveston for shipment by barge or steamship.

\textsuperscript{50} Texas Almanac 1949-1950, p. 289.

\textsuperscript{51} Modern Sulphur Mining (author not given), p. 6.

\textsuperscript{52} Haynes, \textit{op. cit.}, p. 315.
More sulphur is shipped from Galveston than from any other port in the world. A considerable amount is also shipped from Freeport.
CHAPTER VI

DEVELOPMENT OF INDUSTRY

The Gulf Coastal Prairie is the leading industrial area of the state. Although the modern era began with Spindletop there are a number of basic industries which date back many years, some to the settlement of the region by the Anglo-Americans. Grist mills for the grinding of corn and wheat, and gins for the baling of cotton comprised the first manufacturing enterprises. Later there were the mills for the crushing of cane, and kettles for converting the juice into syrup and sugar. These were, however, localized industries which were, more often than not, considered a part of the farm activities.

The first important manufacturing business in Texas was the production of lumber. It is believed that the first sawmill in Texas was built by John R. Harris, the founder of Harrisburg, in that village about 1829.\(^1\) Austin reported the operation of two steam sawmills in 1833.\(^2\) During the period before the Civil War sawmills were built in the more


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populated areas where there was a local market for their products. Inadequate transportation facilities at this time prevented the development of these industries on an extensive scale. A description of the industry in Harris County in 1857 is given as follows:

On the San Jacinto River is a body of fine cypress and pine timber, which gives ample employment to a number of steam saw-mills, where lumber can be purchased at the rate of about fifteen dollars per thousand feet. One of the most extensive of these mills is that of Baker and Thompson, who have also a manufactory of sash, door, and blinds, where they keep on hand a general assortment of all goods in their line, and are in the habit of filling all orders intrusted to them at fair prices for cash or city acceptances.3

The lumber industry in Texas was first developed on an extensive commercial scale at Beaumont and Orange. These towns lay on the margin of the vast pine timberland of East Texas where many cypress trees grew along the streams. For a number of years logs were lashed together, making rafts which were floated down the Sabine or Neches to the sawmills. The product of most of these early mills was shingles made from cypress. Florence Stratton described the first method of sawing logs into planks as follows: "A pit was dug deep enough to accommodate a man underneath the log and another on top. A crosscut saw was pulled through the log lengthwise, turning out boards in that manner."4

3J. DeCordova, Texas: Her Resources and Her Public Men, p. 230.
In 1859 Ross and Alexander built the first circular sawmill in Beaumont, which had a daily capacity of 2,000 feet of lumber. During the same year exports from the Sabine area included 109,900 feet of lumber, 12,000,000 shingles, and 97,000 staves. The Civil War brought a temporary paralysis to the industry and for a short time thereafter the people reverted to the pioneer trade of making shingles and staves.

With the coming of the railroads the lumber industry came into its own. At Beaumont in 1876 the Reliance Lumber Company was organized by William Mark, V. Wiess, and Harry Potter. The same year saw the organization of the Beaumont Lumber Company with W. A. Fletcher, F. L. Carroll, John W. Keith, and others as stockholders. These mills, with the Texas Tram and Lumber Company, comprised the backbone of the industry and upon them depended the prosperity of the community. Over in Orange in the early 1880's there was established what was to become one of the largest sawmills in the nation, the Lutcher-Moore Lumber Company.

In 1881 nine lumber mills and six shingle mills were in operation at Orange, making it the chief center for this class of manufacture in Texas; while at Beaumont in 1882 were five sawmills, three shingle mills and three planing mills.

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5 Ibid. 6 F. M. Hughes, Legends of Texas Rivers, p. 18.
7 Stratton, op. cit., p. 135.
8 F. W. Johnson, op. cit., II, 697.
In 1900 the mills of Orange were cutting some 700,000 feet of lumber each day, while Beaumont boasted of shipment of 10,000 carloads annually and the largest creosoting plant in America. In 1925 the Lutcher-Moore Lumber Company had two mills capable of turning out 400,000 board feet of lumber daily.

Beginning about 1927 and extending through the early years of the depression the lumber industry declined seriously. Following this it did not regain its former importance partly because of exhaustion of lumber supplies, and partly because of the interest given to new business activities. The following paragraph describes the lumber industry in Beaumont in 1939:

Despite the decline of the lumber industry, three sawmills in the city, each with a capacity of 40,000 feet daily, handle hardwoods and yellow pine. Beaumont is still the center of this great south-east Texas industry; its lumber concerns handle approximately 12,000,000 board feet of pine annually. Although the manufacture of wood pulp for paper is gradually replacing that of dressed lumber, the latter still ranks second as an export.

The Texas Almanac 1949-1950 shows that there were eighty sawmills operating in the Gulf Coastal Prairie during 1947. Collectively they sawed 91,669,000 board feet of lumber most

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9 R. N. Richardson, Texas the Lone Star State, p. 436.
10 Writers' Project, Beaumont, A Guide to the City and Its Environs, p. 112.
11 Ibid., p. 121.
of which were pine and other soft woods. Harris County had the most mills while Orange County had the largest production of lumber. Other counties with one or more sawmills were Jefferson, Chambers, Brazoria, Fort Bend, Matagorda, and Waller.\textsuperscript{12}

Closely related to lumber milling is the wood pulp and paper industry, which dates back to about 1904. At that time there was established in Orange the Orange Paper Company, which later changed its name to Yellow Pine Paper Company, for the purpose of making paper from the wastes of the sawmills. This mill produced kraft paper bags and wrapping paper at the rate of twenty-five to forty tons per day. The operation of this mill led to the establishment of the E. Z. Opener Bag Company which in 1925 had a daily capacity of 2,500,000 bags.\textsuperscript{13} Later the business activities of these two concerns were combined as the Orange Pulp and Paper Mills, Inc.

A second pulp and paper mill is located in Pasadena near Houston. Known as the Champion Paper and Fibre Company, it began operation of a pulp mill in 1937 and a paper mill in 1940.\textsuperscript{14} The pulp mill has a daily capacity of about 500 tons of pulps. The paper mill converts about 100 tons of this

\textsuperscript{12} Texas Almanac 1949-1950, pp. 195-6.
\textsuperscript{13} A. E. Menn, Texas as It Is Today, p. 145.
\textsuperscript{14} Richardson, Texas the Lone Star State, p. 437.
into magazine paper, food containers, and paper stock, while the remainder is shipped to other mills. 15

Another of the older industries of the Gulf Coastal Prairie is fishing. When the first settlers came to the region they found the coastal waters abounding in fish, crabs, oysters, shrimp, and many kinds of marine life. After visiting a friend in Quintana in 1839, Mary Austin Holley wrote:

We had the finest oysters you ever saw—as long as your hand—some of them—we saw ranges of deer on our way—and ducks & game of all sorts in quantities—made the air thick in some places. Fish is just as abundant—the best of red fish. 16

Oyster production of the state reached its peak shortly after the beginning of the twentieth century with Port Lavaca the center of the industry. At that time more than ninety per cent of the state catch was coming from the bays and river mouths of the Gulf Coastal Prairie. 17 By 1949 the situation was considerably changed with the area contributing only three-fifths of the state's crop. 18 State production had gradually decreased from 114,792 barrels in 1910 19 to

15 Daily Times Herald, January 14, 1951, Section 7, p. 2.
16 M. A. Hatcher, Letters of an Early American Traveller, Mary Austin Holley, Her Life and Her Works, 1784-1845, p. 72.
17 Texas Almanac 1914, p. 233.
19 Texas Almanac 1914, p. 233.
about 50,000 barrels in 1935. Most of this decrease had come about in the Galveston Bay and Matagorda Bay areas because of unsound conservation practices and pollution of the waters of the bays. Some corrective measures began to be taken about 1936 with beneficial results.

The commercial shrimp industry in Texas had its birth in the early 1920's. Prior to that time there had been little market demand for this food. Pioneer work in the industry was done by C. E. Fisher of Port Lavaca, starting in 1923. In 1924 the first carloads were shipped to San Francisco and New York. Following that, shrimping grew rapidly as demand increased and for a number of years has dominated the industry. For the year ending August 31, 1949, the marine catch of the region, excluding oysters, was 10,537,602 pounds. Of this amount 9,224,494 pounds were shrimp. The Galveston area has taken the lead in this phase of the fishing industry. Like oysters, the fish crop of Texas has been on the decline after having reached a peak in 1917, and is at present only one-half of what it was at that time.

Species of fishes caught commercially include redfish, trout, mullet, drum, redsnapper, grouper, whiting, and

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20 Houston Post, April 28, 1936, Section I, p. 12.
21 Port Lavaca Wave, May 16, 1940, p. 1.
flounder. Redsnapper, mullet, drum, and trout constitute the larger part of the catch, which is not large for the region. During 1950, 500,000 pounds of fish, 400,000 pounds of which were redsnapper, were brought to Galveston. 23

With the development of rice culture as a major crop in the Gulf Coastal Prairie has grown the rice milling industry. This industry had its birth in the Beaumont region. In 1892 Joe Broussard added rice milling machinery to his grist mill. The first modern mill was built in 1900 by the Hinz Rice Milling Company of California. This plant later burned and was not replaced. In 1900 Gustave A. Jahn of New York erected a mill of brick structure which he sold to William Carrol and associates who operated it under the name of Atlantic Rice Mills. The next two years saw the construction of two more rice mills, the Beaumont Rice Mills and the McFaddin-Wiess-Kyle Mill. The Tyrell Rice Milling Company was organized in 1915, and erected a modern mill. 24

In 1939 three of the fourteen rice mills in Texas were located in Beaumont. 25 With the coming of World War II and increased acreage, two drying mills were constructed. The Comet Rice Mills, erected in 1927, is the largest of the

23 Daily Times Herald, January 14, 1951, Section 7, p. 5.
mills, and employs from 100 to 249 workers, depending upon the season. This company also packages rice. Its packaging plant is believed to be the largest in the world. Even though not so extensive as in this area, rice mills and dryers are to be found throughout the region. The expansion of rice growing to new areas, such as Calhoun County, has resulted in the establishment of processing plants in those areas. During 1947 and 1948 two dryers and one mill were located at Port Lavaca.

Shipbuilding in the Gulf Coastal Prairie had its origin during the early years of statehood, probably on the Brazos River. Small river steamboats were built in Galveston as early as 1847. The first of these was the Thomas F. McKinney which was built for use on the Trinity River. Texas facilities for shipbuilding in 1857 were described as follows:

"The facilities for building and repairing vessels are very good, and are increasing. The yard and way of Messrs. Biehling & Sherwood, of Galveston, are turning off a large amount of work, as also those of Hand & Miller, on the San Jacinto. Many small schooners and sloops have been built."

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27 "The Golden Coast," Fortune, XL (October, 1949), 86.
30 DeCordova, op. cit., p. 237.
The lack of a steel industry in Texas for many years limited the construction of ships primarily to wooden vessels. During World War I ship yards were erected at Orange and Beaumont to build wooden ships for transport service. After the war these yards were abandoned, but in 1932 the Beaumont Shipbuilding and Dry Dock Company sold its property on Industrial Island to the Pennsylvania Shipyards, Inc. The latter company began construction of steel oil barges and tankers as well as repair tankers and refinery transports. In 1931 the Gulfport Boiler and Welding Works at Port Arthur began the construction of a number of different kinds of steel welded vessels and offered repair facilities.

During World War II the Gulf Coastal Prairie played a more important role in ship construction. A summary of the industry on the Houston Ship Channel was given as follows:

On the ship channel near Houston the Houston Shipbuilding Corp., with a payroll of well over $1,200,000 a week and upward of 21,000 employees, is turning out Liberty ships from yards that a scant two years ago were wooded clay hills. Across the bayou, Brown Shipbuilding Co. is building PC subchasers, destroyer-escort ships, and landing vessels. Adjacent to the Brown yard, Texas Shipbuilding Co., is turning out tugs for the Maritime Commission. The Flatter Boat Works, which built yachts for 17 years, now lays the keels for Army

32 Writers' Project, Port Arthur, p. 131.
tugs and soon will build oil barges. McCloskey & Co.'s San Jacinto shipyard on the channel is building concrete barges. 33

Other shipbuilding industries included the Todd Shipyards at Galveston and the Consolidated Steel Corporation Shipyards, Levinson Shipbuilding Company, and Weaver Shipbuilding Company at Orange. The Consolidated Steel Corporation Shipyards, built after the outbreak of World War II in Europe, constructed 2,100-ton destroyers. Tugs and barges were constructed by the Levinson Shipbuilding Company. 34

Contributing greatly to the economic development of the cities of the region has been the shipping industry. Chief among the products shipped from the ports of the area have been cotton, grain, lumber, sulphur, and petroleum. Until the turn of the century cotton and grain were most important, with Houston and Galveston striving for domination. Cotton warehouses were among the earlier business establishments. The first press on Galveston Island was a crude wooden press operated by D. and F. G. Miels at San Luis. In 1846 a metal one was constructed in Galveston. Following the Civil War improved presses were put into operation and by 1887 Galveston compresses had a daily capacity of 6,000 bales and a


34 H. Hewes, "Orange, Texas--War-Impact Town," The American City, LIX (November, 1944), 67-8.
storage capacity of 140,000 bales.\textsuperscript{35} The first large warehouse in Houston was a two story structure owned by Tom Whitmarsh.\textsuperscript{36}

Upon becoming a deep-water port Galveston took the lead in export of both cotton and grain. However, completion of the twenty-five foot channel to Houston in 1914 took away from Galveston's advantage. Houston's cotton exports increased from 275,879 bales in 1920 to 1,657,688 bales in 1935.\textsuperscript{37} Because of Galveston's direct rail connections with the interior she has been able to retain her lead in exports of cotton and grain while Houston has taken over in petroleum. The importance of Galveston's chief exports is described as follows:

No visitor in the downtown area is likely to remain unconscious of Galveston's three principal exports. On every hand are evidences of cotton; . . . the city has fireproof space for two million bales, and has 15 high density compresses. Seen from the bay, a section of the waterfront has a distinctly yellowish cast; the bulk of the state's 2,000,000-ton annual output of sulphur is shipped here. On the skyline loom grain elevators; one of them has room for the storage of 6,000,000 bushels.\textsuperscript{38}

\textsuperscript{35}The Galveston Daily News, op. cit., Section D, p. 5.

\textsuperscript{36}J. A. Ziegler, Wave of the Gulf, p. 53.

\textsuperscript{37}"Port of Houston--Commercial Statistics," Houston Port Book, XIV (May, 1936), 36.

\textsuperscript{38}Writers' Project, Texas A Guide to the Lone Star State, p. 273.
A description of the port of Houston is not so simple, as its exports are the most diversified in the state. While her export of cotton and grain almost equals that of Galveston, her total export tonnage is fully six times larger.

The forerunner of the steel industry in the Gulf Coastal Prairie was the foundries, some of which were established during the time of the Republic. These establishments furnished iron for shipbuilding, made boilers, sugarmills, kettles, and other castings in iron or brass. Changes in ways of living brought changes in the products of the foundries, but throughout they were important to the economic welfare of the area. In 1946 there were nine foundries in the region with six located at Houston and one each at Galveston, Beaumont, and Port Arthur.

Other industries concerned with the making of iron and steel products came into existence following the advent of Spindletop. A number of these were concerned with the manufacture of cans and barrels for use in the oil industry; others with manufacture of pipes, drills, and other oil field equipment. Their importance is indicated by the number of enterprises engaged in making or fabricating steel products.

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39 Cordova, op. cit., p. 237.
In 1949 there were more than twenty of these businesses in the Beaumont area.\footnote{1}

The establishment of the first steel plant in the Gulf Coastal Prairie, and the first important mill in the state, came in 1941 and 1942 when the Sheffield Steel Corporation built a $17,000,000 openhearth mill near Houston. Plans for this mill were being considered before the advent of World War II. The government Defense Plant Corporation built additional facilities which were operated by Sheffield during the war. The entire plant reached a peak production of 500,000 tons of steel. Normal annual production is 350,000 tons in products which include barbed wire, road mesh, nails, wire, structurals, reinforcing steel, and plate steel.\footnote{2}

The newest, the largest, and probably the most important group of industries to come to the Gulf Coastal Prairie are the chemical industries. Basically most of them are related to oil and gas or depend upon them as a source of fuel. Although there were a few chemical industries in the region before 1940, most of them have come as a consequence of the war. That they would have been established there even though there had been no war is indicated by the continued increase of those industries since the end of the war.

\footnote{1}{\textit{Directory of Beaumont Area Manufacturers}, op. cit., p. 27.}
\footnote{2}{\textit{More Texas Steel},\textit{ Business Week} (January 26, 1946), p. 46.}
More capital investment has gone into chemical plants in the Texas Gulf Coast than in any other chemical producing region of America since the end of World War II. Indeed, in 1947 alone, upwards of $120 millions were invested in chemical plants along the coast, or one out of every six dollars spent on chemical plants in the nation.\(^4\)

During the period 1939 to 1945 an estimated $1,000,000,000 was invested in chemical plants, and another $350,000,000 from 1945 to 1950.\(^4\) It should be noted that although not all of this was spent in the Gulf Coastal Prairie, a large percentage of it was.

The reasons that chemical industries came to locate in this region are well summarized as follows:

We are accustomed to concentration of industry around what is called the "industrial trinity"—iron, coal and limestone. Now there looms a "chemical trinity"—acids, hydrocarbons and fresh water. The Gulf Coast has them all in virtually unlimited quantities: acids in sulphur and salt, hydrocarbons in petroleum and natural gas, fresh water from the heavens. This is the basic reason for the biggest thing happening on the Gulf: the shift of the busy industrial-chemicals industry to this section—75 chemical manufacturing companies have been built here since 1940, more than half of them since the end of the war.\(^5\)

Wartime safety measures, as well as availability of resources, caused many of these industries to locate in areas not previously industrialized. The result has been that more

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\(^4\) Ibid.

counties of the area have benefited from this increased industrial activity.

One of the first industries to locate in this region was the Dow Chemical Company. About 1937 it decided to locate a plant at Freeport for the purpose of extracting magnesium chloride from sea water and converting it into magnesium metal. An 800 acre site fronting on the Gulf was selected and a $12,000,000 plant constructed.

The first magnesium unit, with a capacity of 12,000,000 pounds annually, and with facilities for handling 300,000,000 gallons of water daily, was completed early in 1941. The first billet of magnesium at Freeport was poured on January 21, 1941. This was the first instance of any metal of consequence having been extracted from sea water at any time in the world's history. During the next three years more than 100,000,000 pounds of metallic magnesium was produced at Freeport.46

During 1941 the capacity of the Freeport plant was expanded to 30,000,000 tons. In October of the same year the government Defense Plant Corporation authorized the building of a 72,000,000 pound capacity plant to be located at Valasco. This plant, completed in June, 1942, was operated by Dow during the war years.47 After the war ended Dow purchased the plant. The Dow industries at Freeport and Valasco are


divided into six divisions in which are produced a total of forty-four organic and inorganic chemicals.

The products of the chemical industries of the region number in the hundreds. At Texas City the Union Carbide and Carbon Corporation makes vinylite and other plastics. The E. I. du Pont de Nemours and Company's plant on the Guadalupe River, near Victoria, manufactures chemical intermediates of nylon which are shipped to factories in other states for making nylon yarn and plastic.

Another set of industrial plants which were an outgrowth of the war were those manufacturing synthetic rubber. In 1942 the Gulf Oil Corporation, Pure Oil Company, Atlantic Refining Company, Socony-Vacuum Oil Company, and the Texas Company organized the Neches Butane Products Company to supervise construction and operation of a Defense Plant Corporation butadiene plant at Port Neches. Chambers describes the plant as

the world's largest synthetic rubber plant, a $60,000,000 group of fantastic structures--giant towers, scores of silvery, spherical tanks, and miles of coiled and twisted pipes and tubes. It is a queer-looking factory built out of doors, but with roots two miles deep.

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49 Butadiene, made from petroleum, is one of two major basic ingredients of synthetic rubber of the GR-S type. The other ingredient is styrene.


This plant, with a 120,000 ton annual capacity, led to the building of other plants by private industry, some to manufacture the same product, others to utilize these products. The Firestone Tire and Rubber Company and B. F. Goodrich Chemical Company built plants at Port Neches to use the butadiene produced at Port Neches. Humble Oil and Refining Company built and operated three plants for the government, two at Baytown and one at Ingleside. General Tire and Rubber Company operated a plant at Baytown and the Sinclair Rubber Company and Goodyear Synthetic Rubber Company built plants at Houston.

Following World War II a number of these plants were put on stand-by basis. In 1949 the plants in operation were the General Tire and Rubber Company, Baytown; the B. F. Goodrich Chemical Company, Port Neches; the Goodyear Synthetic Rubber Corporation, Houston; and the Humble Oil and Refining Company, Baytown.

One of the numerous outgrowths of the chemical industry is the manufacture of paint. With the addition of chemicals, now being produced, Texas has nearly all of the ingredients needed to make paint. Another incentive is the increased

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52"The Golden Coast," op. cit., p. 93.
market created by the large development of industry.\textsuperscript{55} Statistical information for the year 1946 showed that twelve of thirty-six paint manufacturing concerns in the state were in the Gulf Coastal Prairie. Eleven were in Houston and one at Beaumont.\textsuperscript{56}

Table 5 shows the chemical industries located in the Gulf Coastal Prairie as of October, 1949. Information in the table is based on material in "Gulf Coast Chemical Industry," a progress report prepared by the Houston Chamber of Commerce. It should be noted that some of the companies listed, such as Sheffield Steel Corporation, produce chemicals only as a by-product.


\textsuperscript{56}McGuire, \textit{op. cit.}, pp. 51-53.
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<th>Name of Company</th>
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<tr>
<td>Neches Butane Products Company</td>
<td>Port Neches</td>
<td>O</td>
</tr>
</tbody>
</table>
**TABLE 5--Continued**

<table>
<thead>
<tr>
<th>Name of Company</th>
<th>Location</th>
<th>Type of Chemicals Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nyotex Chemicals...........................</td>
<td>Houston</td>
<td>0</td>
</tr>
<tr>
<td>Pan American Refining Corporation (Chemicals Division).............</td>
<td>Texas City</td>
<td>0</td>
</tr>
<tr>
<td>Phillips Chemical Company.</td>
<td>Houston</td>
<td>F</td>
</tr>
<tr>
<td>Rohm and Haas Company...............</td>
<td>Pasadena</td>
<td>0</td>
</tr>
<tr>
<td>Sheffield Steel Corporation..</td>
<td>Houston</td>
<td>0 F</td>
</tr>
<tr>
<td>Shell Chemical Corporation...</td>
<td>Deer Park</td>
<td>0</td>
</tr>
<tr>
<td>Stauffer Chemical Company.</td>
<td>Freeport</td>
<td>S</td>
</tr>
<tr>
<td>Visco Products Company............</td>
<td>Sugarland</td>
<td>0</td>
</tr>
</tbody>
</table>

*C* - carbon black; *E* - elemental gases; *F* - industrial fertilizer chemicals; *I* - inorganic chemicals; *O* - organic chemicals; *S* - sulphur.
CHAPTER VII

A LOOK TO THE FUTURE

The Gulf Coastal Prairie in the future, as in the past, will play a leading role in the economic development of the state and the nation. As the area is endowed with many favorable physical characteristics and an energetic people, much is to be expected of it.

Continued development and conservation of the fresh water resources of the region is of vital importance. As previously indicated, much of the work of the harnessing of the rivers is to be done in inland areas. Such projects are sure to have the support of the people of the Gulf Coastal Prairie, as a continuous and sufficient supply of water is necessary to the irrigation of rice. Location of new industry in the region hinges in no small degree upon fresh water. Many of the industrial processes, especially those centered around chemicals, require tremendous quantities of water.

In areas where there has been considerable industrial development there has been a tendency to reduce rather than to expand agricultural activity. This trend may be expected to continue. Any increase in agricultural acreage may be expected to come primarily from the making available of new lands through drainage. Farmers are becoming increasingly
aware of the wisdom of soil conservation measures. Rice farmers, for example, have learned that they must not plant rice for more than two consecutive years: they must rotate by planting some other crop, or let the land lie fallow for one or two years. If rice is planted continuously year after year, the land will be taken over by a "wild rice" which will completely ruin the crop.

The livestock industry in the Gulf Coastal Prairie has a bright outlook for the future. Within recent years ranchmen have become greatly interested in improving the breed of their cattle and have done so to a considerable degree. The introduction of the Santa Gertrudis breed of cattle may prove almost as revolutionary to the cattle industry as introduction of the Brahma. Improvement of pastures and range land by use of fertilizers and improved grasses offers possibilities of at least doubling the carrying capacity of the land.

Even though transportation facilities in this region have been considered among the best in the state, there is much to be hoped for. The greatest need is in improved highways over which freight is hauled into and out of the region. Houston is working toward a forty-foot ship channel at least by 1960. Other ports, especially Beaumont and Port Arthur, can be expected to do the same as deeper channels will be needed to take care of the super-tankers now being built.
The industrial growth of the Gulf Coastal Prairie during the past decade has been among the most rapid of any section of the nation. The preparation for war, and later war itself, brought about the birth of the region as an industrial empire. The significant fact is that the boom did not end with the close of the war, but it has accelerated. Geographic and economic factors favor the location of certain industries in the region and thereby seem to assure a continued growth. Among these factors are: proximity to raw materials; proximity to fuel and power; adequate transportation; a mild climate; reasonable cost of land; reasonably low taxation; sufficient industrial water supply; and the vigor of the people. Among the handicaps are distance to markets and lack of sufficient manpower, especially skilled laborers.¹

Location of industry in the region can be expected to follow somewhat the pattern set during the war of scattering out so as to minimize damage in case of an air attack. This policy will benefit the less industrialized sections by giving them a more stable economy.

What is happening in Houston is the story of what is happening in many smaller cities of the region on a proportionate scale. Houston's growth during the last ten years has been described as follows:

¹E. J. Fosque, "Industrialization of the Texas Gulf Coast Region," The Southwestern Social Science Quarterly, XXXI (June, 1950), 5-7.
Retail sales have multiplied four-fold since 1940. Employment in manufacturing alone jumped from 22,600 workers in 620 plants in 1939 to 75,000 workers in 1,165 plants in 1950. The number of telephones in use more than doubled since 1940. And bank deposits rose from $350,000,000 in 1940 to $1,333,000,000 in 1950. 2

Houston, already the second largest port of the nation, may be expected to retain that position. The fastest growing large port of the nation, her tonnage of goods handled increased from 18,516,223 tons in 1934 3 to nearly 42,000,000 tons in 1950. Her rank as a port, over the same period of time, jumped from sixth to second. Although she trails New York by too great a margin to have any immediate hopes of attaining the rank of the number one port, she may be expected to fasten a stronger grip on the number two spot. One of the weaknesses of all of the ports of Texas has been the large excess of exports over imports. There is now a discernible trend, at least in the case of Houston, that indicates a better balance of trade. During 1950 Houston's overall increase in tonnage represented a gain of 11.3 per cent while imports showed an increase of 66 per cent over 1949. 4

2"Houston's 'Boom' Never Ends," Senior Scholastic, LVII (April 25, 1951), 8.

3Texas Almanac 1936, p. 334.

4"1950: Record Tonnage Year," The Houston Port Book, XXIX (April, 1951), 23.
Expectations for the future are further reflected in the increasing population of the cities of the region. Again Houston has set the pace.

Houston's 1940 population of 384,514 jumped to 594,321 in 1950—a ten year increase of 55 per cent. This is a greater percentage increase than that of any of the other 30 top-ranking cities except one—San Antonio. . . . And Houston rose from twenty-first largest to fourteenth largest city in the U. S. Her rate of increase since 1940 is almost four times greater than the national average.5

Table 6 shows the population of the larger cities of the region from 1930 to 1950. Data is given only for those cities which had a population of 15,000 or more in 1950. Population statistics for 1930 and 1940 are based on United States census figures given in different issues of the Texas Almanac while data for 1950 is taken from a booklet published by A. J. Nystrom and Company entitled 1950 U. S. Census.

5"Houston's 'Boom' Never Ends," op. cit., p. 8.
TABLE 6

CITIES OF THE GULF COASTAL PRAIRIE AND THEIR POPULATION

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1930</td>
</tr>
<tr>
<td>Baytown.....</td>
<td>Harris</td>
<td>5,200</td>
</tr>
<tr>
<td>Beaumont...</td>
<td>Jefferson</td>
<td>57,732</td>
</tr>
<tr>
<td>Galveston..</td>
<td>Galveston</td>
<td>52,938</td>
</tr>
<tr>
<td>Houston.....</td>
<td>Harris</td>
<td>292,352</td>
</tr>
<tr>
<td>Orange.....</td>
<td>Orange</td>
<td>7,913</td>
</tr>
<tr>
<td>Pasadena...</td>
<td>Harris</td>
<td>1,647</td>
</tr>
<tr>
<td>Port Arthur</td>
<td>Jefferson</td>
<td>50,902</td>
</tr>
<tr>
<td>Texas City.</td>
<td>Galveston</td>
<td>3,534</td>
</tr>
<tr>
<td>Victoria...</td>
<td>Victoria</td>
<td>7,421</td>
</tr>
</tbody>
</table>

*Between 1940 and 1950 Baytown, Goose Creek and Pelly were consolidated to form one municipality known as "Baytown." The population figure for 1950 is for this consolidated area.

The tenacity which the people have shown in meeting and overcoming their problems, together with the many economic factors favoring the region, leads to the belief that the Gulf Coastal Prairie is destined to become one of the chief industrial and population centers of the world.
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