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Louisiana Survey Systems: Their Antecedents, Distribution, and Characteristics.

John Whitling Hall
Louisiana State University and Agricultural & Mechanical College

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LOUISIANA SURVEY SYSTEMS: THEIR ANTECEDENTS, DISTRIBUTION, AND CHARACTERISTICS.

The Louisiana State University and Agricultural and Mechanical College, Ph.D., 1970
Geography

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LOUISIANA SURVEY SYSTEMS:
THEIR ANTECEDENTS, DISTRIBUTION, AND CHARACTERISTICS

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in

The Department of Geography and Anthropology

by

John Whitling Hall
B.S., University of Southwestern Louisiana, 1956,
M.A., Southern Illinois University, 1963
January, 1970
PLEASE NOTE:

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ABSTRACT

Survey systems are expressions of ideas men have about the way land should be subdivided. Once put into use, the survey system becomes part of the settlement pattern. The occupance pattern thus defined puts a cultural and physical imprint on the face of the earth which may persist for millenia.

Louisiana appears to be unique among the United States in having four survey systems within its boundaries. Successively settled by French, English, Spanish, and Americans, the state has experienced the land division ideas of each of these. As these cultural groups settled on the land, distinctive cadastral patterns began to appear on the landscape. The major culture groups settled areas which had distinctive physical characteristics. A brief physical and culture history sketch of Louisiana is given.

The arpent or long lot division was introduced by the French and was continued by the Spanish. This long, narrow parcel of land is characteristic of the streams of south Louisiana, but extends along the major waterways into north Louisiana. It was widely distributed in western Europe by the 12th century.

The Anglo-Saxon settlers in the Florida Parishes
brought in the idea of irregular or metes and bounds surveys. This system leads to a crazy-quilt field pattern and spiderweb roadnet. The method is ancient in Europe, particularly in the old Celtic lands. The first written charters in Anglo-Saxon England are described with this irregular survey.

The Spanish stockmen in the western portion of Louisiana used the square sitio type of division. These are usually one league square, and were specified for the Posts of Opelousas and Attakapas (St. Martinville). The antecedents of the sitio system are more obscure than the others, but appear to be at least medieval.

The great majority of Louisiana's area is covered by the American rectangular system, with its township and range lines oriented to the cardinal directions. The closest European antecedent appears to be the centuriatio of ancient Rome. The forebears of the centuriatio go back at least to the 6th century B.C. in Greece.

Though all systems are subsumed as irregular sections in the rectangular system, the physical and cultural landscape of Louisiana is still influenced by each of these four systems.
INTRODUCTION

The study of settlement and its patterns has long been an integral part of geography in both Europe and the United States. European geographers, however, have placed more emphasis on the geometrical patterns of properties and roads. American geographers have largely neglected this aspect of the landscape, for as late as 1954 the committee on settlement geography writing in American Geography: Inventory and Prospect noted that the study of these "contrasts in settlement patterns . . . would repay careful investigation" (James and Jones, 1954, pp. 127-128). Since then, few geographers have shown interest in this facet of discipline. Two notable exceptions are found in the works of Pattison (1957) and Thrower (1966). The former deals with the beginnings of the American rectangular survey and the latter compares the effects of two ways of dividing the land in an area of northwestern Ohio.¹

Though cadastral pattern studies have been comparatively few, the patterns themselves are basic and enduring. Recent photographs of the earth from space indicate that the cadastral patterns that man has engrained into the surface of the earth may be the only visible evidence of man's
existence on the planet.

Survey systems are expressions of ideas men have about the way land should be subdivided. They are not natural in any sense except to those who use them. When man puts a survey system into use, the occupance pattern thus defined puts a cultural and physical imprint on the face of the earth which may persist for millenia. Even after new systems have been superimposed, it is often possible to detect parts of former systems like palimpsests on the landscape.

Louisiana provides an excellent area for the study of surveys, due to the variety of systems represented. The state appears to be unique among the United States in having the greatest variety of survey types. Successively governed and settled by French, English, Spanish, and Americans, the state has experienced the land division ideas of each of these to greater or lesser extents. As these different cultural groups settled on the land, often in different physical milieux, distinctive cadastral patterns began to appear on the landscape. The major culture groups settled areas which had distinctive physical characteristics, and a brief description of each helps set the stage for the early European occupance.

Louisiana's surface features may be categorized into three broad landform types: hills, terraces, and floodplain and marsh (Fig. 1). The hill area occupies the
northwestern part of the state, and is divided into two unequal parts by the relatively narrow (10-15 miles wide) Red River valley. Other floodplains in the hill country are much narrower. Some individual features of the hill country are Kisatchie Wold, sloping rather steeply toward the northwest, and with longer, gentler slopes toward the Gulf. The Nacogdoches Wold, northwest of the Kisatchie, is a similar, but more gently sloping feature. The Sabine Uplift provides relief farther to the northwest, with associated features such as the Dolet Hills of DeSoto Parish. The eastern edge of the hill region is characterized by rough country west of the Ouachita River, an area collectively known as the Ouachita Hills.

The terraces occupy two large areas in the south central and eastern part of the state, with two major outliers to the north: the Bastrop Hills and Macon Ridge. The Bastrop Hills represent an alluvial cone of the Ouachita River, and include some terrace deposits, while Macon Ridge represents an alluvial cone of the Arkansas River which also encloses some terrace deposits. The Bastrop Hills stand as high as 70 feet above the floodplain of the Mississippi, while Macon Ridge stands as high as 40 to 50 feet above the plain. The terraces proper are the result of alternating periods of deposition and erosion during Pleistocene glaciation, and contain basal gravels grading upward through sands and clays. While the surface of the terraces is mostly smooth to gently rolling, local stream-eroded areas, such as
the eastern portion in the Florida Parishes, exhibit considerable local relief. The western part of the terrace area contains meander scars of an ancestral Mississippi River.

The most important agent in the formation of modern Louisiana is the Mississippi River. The floodplain of the Mississippi, with an average width of 50 miles, slopes very gently toward the Gulf. Its surface is characterized by subtle relief features which consist of ridge-and-swale topography—old channel scars and former natural levees—and cut-off, or oxbow lakes. The alluvial soils of the floodplain were high in natural fertility at the time of early European settlement, but were subject to frequent and long-lasting floods. A northern feature of the floodplain area is the poorly-drained Tensas Basin, formerly occupied by the Mississippi. To the south is the Atchafalaya Basin, named for that major distributary of the Mississippi.

The coastal portion of Louisiana consists of two different marsh areas, both of low elevation and low relief. The delta plain to the east consists of a series of overlapping former deltas of the Mississippi. This area is characterized by a very irregular coastline. To the west is the chenier plain created by the action of Gulf waves. Here, a series of old beach ridges extend inland, generally parallel to the modern shoreline. The slight relief (six feet or
or less) of the beach ridges, which are known as cheniers, is still sufficient to have attracted settlement.

This diversified physical environment was selectively settled by Europeans or their descendents, beginning in the latter 17th century. While the Europeans did settle some areas occupied initially by Indians, and while there may be some evidence that the Indians used some sort of boundary markers, the Europeans generally ignored these and established their own systems. The settlement succession of Europeans occurred at different times in the several physiographic regions, due in part to the nature of the physical environment.

French Settlement

The earliest French attempts at settlement near present-day Louisiana began with the establishment in 1699 of Ft. Maurepas on the Bay of Biloxi at the present site of Ocean Springs, Mississippi. In 1701 the colony moved to a site on Mobile River in search of better agricultural land. Two contemporary forts on Dauphine Island (Massacre Is.) and Ship Island (Isle aux Vaisseaux) and the one at the site of Mobile formed the nucleus of French settlement for 20 years (Knipmeyer, 1956, p. 18). By 1712, the royal management had failed and the colony was given to a succession of private persons and companies. Antoine Crozat was granted a commercial monopoly on Louisiana in 1713, but conditions for
agriculture in the coastal soils were poor, and the early settlers were not interested in farming.

The focus of settlement was moving toward the Mississippi Valley, and by 1720, a number of settlements had been established in the area of present-day Louisiana and adjacent Mississippi (Fig. 2). These included Natchitoches, the first permanent Louisiana settlement (1714), Baton Rouge (1720), Fort Rosalie (Natchez, 1720), and Yazoo Post (Vicksburg, 1720).

Agricultural settlements spread outward from the fort sites, and were most extensive in the vicinity of New Orleans (1718). In 1720, German immigrants, mostly from the Rhineland, settled upstream from the French settlements on the Mississippi. This area came to be known as La Cote des Allemands, and was initially on the right bank of the river. The German Coast eventually included both sides of the river from about 25 miles above New Orleans to about 45 miles above that settlement. While these German folk were important settlers and successful farmers, they were rapidly absorbed into the French population, and left little mark on the cultural landscape (Knipmeyer, 1956, pp. 20-23).

In 1731 the French government resumed control of the Louisiana colony. At that time there were some 5,000 whites and 2,000 Negroes in the colony. The important rural settlements were along upper Bayou Lafourche, on the Mississippi at Bayou Manchac, around Baton Rouge, Pointe
Coupee, and Natchitoches, as well as along the Mississippi above and below New Orleans (Knipmeyer, 1956, p. 24).

Then, in 1763, the Isle of Orleans and the territory west of the Mississippi were ceded to Spain as a result of the Seven Years' War and the Treaty of Paris. Except for a few weeks in 1803, Spain controlled the colony until it became a territory of the United States in 1803. Before Spain gained effective control of Louisiana, however, more people of French descent entered. These were the Acadians, driven from Nova Scotia (Acadia) by the British in 1744. They fled to Europe and the Atlantic coast of North America, and were later accepted in great numbers (4,000) by the Louisiana French (Knipmeyer, 1956, p. 24).

About 1765 the Acadians ("Cajuns") were settled on the Mississippi above and below New Orleans in the area called the Upper and Lower Acadian Coasts, around False River, on upper Bayou Lafourche, and along Bayou Teche. These Acadians were culturally distinct from the other Louisiana French settlers, who were generally known as Creoles. The former were poor and worked small farms (petits habitants). These Roman Catholic folk had great absorptive powers over most aliens with whom they came in contact (Knipmeyer, 1956, p. 25).

The French settlers, particularly the Acadians, had a high birth rate and great capacity for absorbing outside
elements. The Spanish government of Louisiana attempted to offset this by submerging the French with Spanish immigrants from the Canary Islands (Islenos) and Malaga, Spain. These were settled along Bayou Terre aux Boeuf (St. Bernard Parish), Bayou Lafourche, the Amite River (Galveztown), and New Iberia on Bayou Teche, but like the German population, most of the Spanish were culturally absorbed. They left only a few place names, their Spanish surnames, and some small Spanish-speaking enclaves in the Bayou Terre aux Boeuf area (Knipmeyer, 1956, pp. 25-26).

With the turn of the 19th century, Anglo-American settlement encroached upon the Louisiana colony. Her port of New Orleans was important to American settlements up the Mississippi in Kentucky, Tennessee, and Illinois. Though the Spanish governors tried to prevent masses of Anglo-Americans from entering Louisiana, these people of Anglo-Saxon stock increased as Spain's control weakened. The colony was ceded to France, and shortly thereafter (1803), the United States purchased the territory. During the territorial period (1803-1812), French Louisiana suffered the greatest onslaught of Anglo-American settlement. As cotton joined sugar cane as a plantation crop, American planters increasingly occupied formerly empty territory (Knipmeyer, 1956, pp. 26-27).

By 1803 Louisiana's population amounted to about 50,000. New Orleans was the largest settlement (ca. 10,000)
and the rest of the territory was primarily rural. The banks of the Mississippi were fairly well populated from below New Orleans to the mouth of Bayou Lafourche. Acadian settlement extended down Bayou Lafourche from its mouth at Donaldsonville to about Thibodaux. The rest of the population was scattered, with nodes of settlement near the mouth of Bayou Manchac, on the Amite, at Baton Rouge, at Pointe Coupee, and Acadian settlements in the west along Bayou Teche and Vermilion River (Knipmeyer, 1956, p. 27).

Arpent lots are obvious in the southeastern area of the state along streams in the prairies, up the Red River and in the northeast (Fig. 3). In the southeast the natural levees were the only areas of high ground, and thus relatively safe from flooding. The reasons for riverine settlement are less obvious in the southwestern prairies. The larger streams provided the major avenues of transportation in the empty prairies until a road net was established. Another major factor is the heavy nature of the prairie soils, underlain by a deep claypan. The lighter, better-drained alluvium adjacent to the streams was easier to till.

American long lots, established after 1803, are not easily indicated on a small-scale map, especially in the southern part of the state. They are interspersed among the arpent lots of French and Spanish origin, and on large-scale maps are readily identified by their regular shape and
LOUISIANA
GENERALIZED DISTRIBUTION
OF
SURVEY SYSTEMS

- ARPENT and AMERICAN LONG LOT
- IRREGULAR
- SITIO
- RECTANGULAR
- UNSURVEYED

SOURCES: MAPS 64-5000, SUGAR TOWN AERIAL SURVEYS, 1961.
LOUISIANA DEPT. OF HIGHWAYS

FIGURE 3
straight backlines. The American long lots are the dominant type, however, in several areas. Virtually the only long lots found along the Mississippi from Pointe Coupee northward to the Arkansas border, and from the northern part of Plaquemines Parish (hamlet of Alliance) downstream to the mouth are the American long lot type. The streams in the Atchafalaya Basin are festooned with the American modification as are most of the long lots found in the coastal marshes. These latter areas represent lands which were not as desirable, due to lower elevations and narrower width of the natural levee. These were not densely occupied and consequently these long lots are most apparent on the cadastral map and may not be obvious from the air or on photographs. In the upper part of the Mississippi (Tensas Basin), after the land was occupied, it often was consolidated into large holdings which largely obscured the original survey lines (Phillips, 1953, p. 167).

By the time of statehood, the French were well on their way toward assimilating the Spaniards and others as they had the Germans. The Acadians and Creoles tended to remain separated in non-plantation areas, and the former tended to be displaced by Creole and American planters in suitable plantation areas. The Isleños were generally absorbed, except in the Terre aux Boeuf area, where there was apparently little outside interest (Knipmeyer, 1956, p. 28).

It is apparent from Fig. 3 that arpent system
surveys are generally absent from the streams in the Florida parishes. The narrow nature of the floodplains preclude their practical use, but more important, the uplands which characterize this area were not attractive to the French settlers. During the British occupation of this area the French were also unwelcome, having recently been displaced from British Nova Scotia.

The area thus dominated by Creole and Acadian French was primarily riverine. Settlements were strung out along the Mississippi, Bayou Lafourche, Bayou Teche, and other streams. The highest and driest lands in these areas were the levee ridges deposited by the streams, with the interfluvial basins either consisting of swamps or marshes, or subject to periodic inundation by floods. South of Baton Rouge there are no elevations over 30 feet above sea level, and the highest land is the levee crest. This slopes almost imperceptibly back from the crest ("front") toward the ill-drained backland ("back").

The width of these natural levees is proportional to the size of the depositing stream, and all of these diminish in height as they approach the Gulf. All of the larger levees in the deltaic plain are former main or distributary channels of the Mississippi (i.e., Bayous Lafourche and Teche). The width of the levees is not uniform throughout their course, nor are they of equal width on opposite sides of the stream. The width of the natural levee is considered
to be the distance from the stream to the limit of cultivation on the backslope or to low, wet ground (Knipmeyer, 1956, p. 6). In the deltaic area the widest levees are on the Mississippi, just south of Baton Rouge and on the upper Lafourche, where the width is approximately six miles. Below Baton Rouge through St. James Parish the Mississippi levees narrow to three to four miles, and below St. John the Baptist Parish, few areas are wider than three miles. Farther downstream, Mississippi levees narrow from a maximum of one mile to the point where the roads stop on both banks. Bayou Lafourche's levees dwindle from three to four miles in width near Donaldsonville to almost nothing at the coast (Knipmeyer, 1956, pp. 6-7). Other bayous have similar levee systems, but on a smaller scale.

Most of the higher land lies between these levee ridges and drops from elevations of about five feet to sea level at the coast. The physical geography of this part of the state dictated where agricultural settlements could be located in the early days, and settlements developed in an orderly pattern created by the terrain. Natural levees provide the only area with ground high enough for settlement, and their width determined the amount of cultivable land in the region (Knipmeyer, 1956, p. 12). These areas, successively governed by France, Spain, and the United States, and first settled by the French, are covered by arpent lots granted by the French and Spanish, and by American long lots.
The empty interfluvial basins were subsequently divided according to the American rectangular survey or remain unsurveyed (Fig. 3).

In the prairies to the west, the initial European occupancy was primarily by Acadian French about 1765. Settlement was confined mainly to the levees of Bayou Teche and those of adjacent navigable streams, such as the Vermilion River (Fig. 3). The Spanish government continued the French practice of granting long narrow strips of land along streams, and also granted special square or rectangular parcels for stock-rearing (see below, p. 19). The Acadians often arrived in sizable groups, each forming a nucleus of settlement. These nuclei were often separated by many miles of open, empty prairie (Taylor, 1956, p. 45). The prairie interfluves remained mostly unsurveyed until the latter part of the 19th century.

ANGLO-SAXON SETTLEMENT

The areas first settled in Louisiana were the riverine areas of the deltaic plain, and the similar environments in the prairies. The hill country to the north and the dissected terrace lands to the east were settled later, and by peoples of different cultures who came from different parts of Europe. As described above (p. 2-3), the hill country is of rather low elevation and has a rolling to locally rugged surface. The Anglo-Saxon-settled area which
bears the characteristic survey type is the dissected, rolling eastern terrace area—the Florida Parishes.

The ridgecrests of these sandy, pine-covered hills developed as the major sites of settlement and cultivation. The streams which drain the Anglo-Saxon settlement area are only tributary streams, and as such were never important transportation routes except for local rafting of logs or other localized movement (Wright, 1956, p. 13). The floodplains of these streams are narrow and often swampy. They have seen little use other than for sugar cane or pasture land, because of flood danger and the heavy nature of the soils.

If St. Helena Parish is representative of the Florida Parishes as a whole, there were few European settlements prior to 1800 (Newton, 1967, pp. 29-30). Earlier settlement nuclei were Natchez (Ft. Rosalie, 1720), Bayou Sara (St. Francisville), and Baton Rouge (1720), and settlement diffused eastward into the dissected terraces from these nodes.

Great Britain took possession of the Florida Parishes in 1763 as a result of the Seven Years' War and the Treaty of Paris, and the British government proceeded to grant land to English settlers or to colonials from the American colonies. Other English (Tories) moved into the area after the American Revolution. While some of the English grants were surveyed, there were never a great
number of British settlers. Instead, the bulk of the Anglo-Saxon settlers migrated into the Floridas from the southern bend of the Tennessee River through western Alabama and eastern Mississippi. Other elements of these Upland South peasant folk immigrated via the Tennessee-Ohio-Mississippi river system. The typical Upland South Anglo-Saxon was of Scotch-Irish descent and made his living by farming, stock-rearing, and hunting. The other element was the influx of cotton farmers moving eastward from Natchez (Newton, 1967, pp. 29-30).

The settlements established by the Anglo-Saxons were markedly different from the riverine, linear patterns established by the French, both on the basis of the settlement pattern and of the survey system involved. They are in fact rather closely connected by a system of social ties—familial and religious—and form dispersed hamlets (Newton, 1967, pp. 44-45).

These Upland Southerners divided their land by an irregular survey and used irregular field patterns which appear to be casually draped over the crests of the interfluves. Roads tend to follow ridges and hill crests, and connect the farmsteads which have an affinity for such locations, giving a spiderweb appearance to the roadnet (Newton, 1967, p. 48).
OTHER EUROPEAN AND ANGLO-AMERICAN SETTLEMENT

The riverine French settlements and Anglo-Saxon hill settlements were settled somewhat earlier than the remainder of the state—i.e., the northern hills, the Tensas Basin and Mississippi floodplain north of Pointe Coupee, and the prairie interfluves. A partial exception to this rule is the establishment of Spanish sitios in the prairies and in the Neutral Strip west of the Red River. Many of these large square parcels were meted out shortly before the turn of the 19th century, primarily for stockrearing (Fig. 3).

Some sitios still appear vivid in the cadastral map (Fig. 19) and may be clearly seen on air photos (Pl. 8). They were connected into the American rectangular system as irregular lots, and as such have numbers above 36 within their respective townships. The U. S. Land Office incorporated many other sitios into the rectangular system by resurvey. In the former Neutral Territory, nearly 300 claims to land were confirmed by the United States. Of this number, the vast majority were 640-acre claims which were ultimately surveyed as regular sections in the American rectangular survey, and cannot be distinguished on the modern cadastral map.

The sitios are found generally outside the original area of Louisiana, in the area formerly held by Spain (Fig. 3). These grants were given in large measure to attempt to get Spaniards to occupy the territory to strengthen the
control of the Spanish crown in this otherwise empty territory. In the area formerly occupied by France, where the arpent system was firmly rooted, and where the bulk of the settlers were French, Spain continued to use the arpent system.

The remainder of Louisiana was surveyed by contract surveyors for the United States government in the characteristic grid pattern of the American rectangular survey system. Exception was made to this pattern in previously unsurveyed lands along streams and locally in the coastal marshes, where the American long lot was established, often in juxtaposition with the French arpent system. The bottomlands in particular were almost completely empty along the Mississippi north of Pointe Coupee, and were to remain so until about 1830 (Phillips, 1953, p. 53). The United States deputy surveyors covered the empty streambanks with American long lots, and the back country with township and section lines between 1820 and 1840. A few arpent strips were surveyed prior to that time, but there is little evidence of them in the landscape today (Phillips, 1953, p. 167).

Rectangular surveys were extended over the rest of the area of the state as settlement progressed. This type, characterized by its orientation to the cardinal points, occupies the vast majority of the area of Louisiana. Moreover, the bits and pieces of arpent, irregular, and sitio surveys are tied into the rectangular system and are subsumed as part of it.
Though it is not often evident to the observer at the surface, both aerial views and cadastral maps reveal the vivid patterns these survey systems create in Louisiana (Fig. 3).

The following pages trace some of the European antecedents of the survey systems which were implanted in the present state of Louisiana. Each survey type is treated as a system which has evolved as it has spread over the area. A "model" or ideal example of each system is given, showing the generalized procedure of survey. Original survey plats are included wherever possible as illustrations of each type. Since land laws and the procedure involved in receiving a grant of land under these systems are integral to the understanding of their operation, a discussion of these topics is included with the model. Though it is not the purpose of this study to give a detailed description of the settlement patterns in each survey area, some of the more obviously associated phenomena are briefly mentioned.
NOTES TO INTRODUCTION

1A notable antecedent to this pattern among American geographers preceded the commentary. Dan Stanislawski's study dealt with the origin and spread of the grid pattern, though he primarily applied the emphasis to town and city plans, rather than to cadastral surveys (Stanislawski, 1946).

CHAPTER I
THE ARPENT SYSTEM

A. GENERAL.

The arpent system (and its American successor) in Louisiana is a method of land division in which each parcel of land effectively is long in proportion to its width. An individual lot is about five times as long as it is wide. The lots usually front on navigable streams or, infrequently, on roadways, with the bounding lines normal to the base. They were, then, rectangular except where a meander effected a pie shape to fit its curving course.

Many names have been applied to the system in Louisiana, such as ribbon farms, radiating lots, long lots, riparian long lots, the French strip layout, and arpent strips. Since the arpent (often spelled arpen) is a French unit of measure, and since the French were the first to introduce its use into Louisiana, the term arpent is suggested for all such lots in the state. The American government later used a similar long-lot in parts of Louisiana, but that system represents only a modification of the system inherited from the French.

The term arpent, then, is French, derived from the
Latin *arepennis*, which comes from the ancient Gallic (a Celtic language). The unit is an ancient agrarian measure containing 100 square perches.² The arpent varied considerably in size because of the variance in size of the perch (Littré, 1956, p. 581). Though the French used several versions of the arpent, the most frequently used was the *arpent de Paris*. Don Vincente Sebastian Pintado, Deputy Surveyor under Charles Laveau Trudeau, Surveyor General of Louisiana for Spain, stated:

> It will be observed, the arpent of paris, of which use was made in Louisiana and West Florida during the Spanish domination, is a square whose side is of ten perches and, of course, contains 100 square perches. The lineal perch of Paris is 18 feet of the same city. The acres are those used by the English in the Floridas, and 512 of these acres are equal to 605 arpents of Paris. (Pintado Papers, Book I, Part I, Opelousas Claims, p. v.)

Land measurements now (1969) generally accepted are: the square arpent - 180 x 180 French feet, equivalent to 192 x 192 American feet; the acre - 208.59 x 208.59 American feet. The arpent contains 36,864 square feet, while an acre contains 43,560 square feet (Pintado Papers, Book I, Part I, Opelousas Claims, p. v.). One square mile is equivalent to 750 arpents.

Prior to France's cession of Louisiana to the United States, the system of weights and measures used in the state appears to have been exclusively French, though Bouchon, Surveyor General of Louisiana, knew of no law relative to weights and measures. According to Bouchon, the linear
arpent, the league of 84 arpents, and the square arpent were the "particular measures of Louisiana" (see above, p. 24).

The arpent was generally considered to be a unit of square measure, but has been used, even into modern times, as a unit of linear measure, especially among horse racing enthusiasts. When used in this sense, an arpent is equal to 11 7/11 English perches, or 192 English feet (American State Papers (Duff Green ed.)), III, pp. 256-263).

Arpent lots are found primarily along navigable streams, especially the Mississippi, the Lafourche and its distributaries, Bayou Teche, the Atchafalaya, the Ouachita, and Red River, at least as far north as Red River Parish. Arpent lots appear sporadically in other areas and may be noted along the western Gulf Coast (Fig. 3).

B. EUROPEAN ANTECEDENTS.

The ultimate origin of the long strip of land containing the housing complex of the settler and his fields is unknown. It appears in ancient Babylonia and is found at a very early date in Europe. Systems virtually identical to those in Louisiana were fully developed in eastern Germany by A.D. 1106 (Fig. 4). After the Saxons opened the eastern lands the long-lot system of survey was introduced into the German borderlands by Frisian, Dutch, and Flemish settlers from the low countries (Thompson, 1928, p. 510).

Prior to the 12th century, much of Low Germany was
DISTRIBUTION OF LONG LOT SETTLEMENTS IN EUROPE

- Highland areas
- Marschhufendorfer
- Waldhufendorfer

After Otto Schulte, 1900
unoccupied, due to the marshy nature of the land.

For the land into which they came the Fleming and Frisian were singularly adapted. In the high feudal age Lower Germany along the coast of the North Sea was an almost uninterrupted series of marshes and fens, which, owing to the sluggish flow of the rivers across the flat plain and the deep indentation of the estuaries like the mouths of the Weser and the Elbe, sometimes extended a considerable distance inland. Mecklenburg and Pomerania were dotted with lakes. Even in the interior there was much bog land and some areas which were huge morasses. (Thompson, 1928, p. 553)

Before the Flemings and Frisians arrived on the Slavic frontier, the German peasants had little knowledge of the techniques of draining or tilling the wet lands. A prime reason that nobles and prelates imported the fen dwellers was their ability as reclaimers of marshes (Thompson, 1928, p. 554). The incoming Netherlanders brought the notion of a village with associated fields which was quite different from the nucleated manorial village prevalent at the time. The new villages were laid out in a series of rectangular blocks of contiguous lots, in contrast to the scattered Gewannflur of the manorial village. These came to be known as "manors of Dutch measurement" (Mansus Hollandriensis dimensionis) (Thompson, 1928, p. 574, n. 1). Thompson cites the tendency to replace the traditional manorial system with its demense, strips of glebe land and dividing balks with this new mansus regalis, characterized by rectangular blocks 720 royal rods by 30 royal rods. There were several advantages to such a field system. The drainage
system was regular and therefore simpler. The long furrows reduced the effort and time required for turning the plow at the end of each furrow (R. Breton, 1968).

Meitzen has shown that the division of allotments into narrow rectangular strips was used in Frisia as early as the 8th century, though it was not Frisian in origin (Meitzen, 1895, II, pp. 47-53). The first obscure references to the granting of these Hufen, or hides of land, dates to the time of Charles Martel (714-741). The extension of the system along the whole Frisian coast has been ascribed to the Carolingian administration (Thompson, 1928, p. 509). In Holland, Zealand, and Frisia, the marsh and moor Hufen were surveyed almost without exception in long straight strips. Some believe the practice was later diffused into the forests (Thompson, 1928, p. 509). There is much disagreement regarding the origin of the marsh and forest villages, however (see below, p. 32). Flemings and Hollanders had been draining and diking since Roman times.5

The exact date of the influx of Flemings and Frisians into Germany is uncertain, but the Flemings appear to have settled in Belgesheim, near Altmark as early as the 6th century. Some followed St. Adalhard and settled around New Corvey between 822 and 827, while others followed Anskar into the Diocese of Hamburg (Thompson, 1928, p. 545 n.). These earlier Flemish settlements precede great movement later in the feudal period. The best known record is an
A.D. 1106 charter wherein Archbishop Frederick of Hamburg-Bremen granted "certain lands which are uncultivated, swampy, and useless" to persons "who are called Hollanders." Frederick divided the lands into rectangular strips called hides, measuring 720 royal rods by 30 royal rods. Though there is some disagreement as to the length of the royal rod, Thompson estimated that the Bremen tract granted by Frederick amounted to an area at least a mile and a half square (Thompson, 1928, p. 509 n.).

The exact procedure for laying off these "manors of Dutch measurement" is not stated, but the Germans of this period are known to have measured land with a rope or line, as described in Helmold's *Cronica Slavorum*.

The German colonists quickly adopted the Dutch system, noting its advantages over the manorial system. Their associated village, called a *Marschhufendorf*, formed a long street, with dwellings on either side, facing the road or a canal. The kitchen garden or orchard surrounded the house. Behind the home lot lay the farm acres, the meadow and the woodlot, in this order, if the lay of the land permitted. The priest's house and the church usually lay somewhere near the center of the village. Besides having the local tithe, the priest had a holding of his own (called "Goddes peece" in England) which was worked either by parish serfs or by the peasants of the village. If there were several villages close together, they collectively formed a parish (Thompson, 1928, pp. 510, 574).
These strip settlements spread widely in the 12th and 13th centuries to parts of the Black Forest and the Odenwald, Upper Bavaria, the upper reaches of the Mulde and the Pleisse and the region between the Lippe and Luneburg (Fig. 4). They also spread over nearly one quarter of Silesia and the marshland in the basins of the Oder, the Wartha, and the Netze (Thompson, 1928, pp. 510-511).9

In 1106 Leopold of Austria issued a charter designed to entice the Flemings to Vienna, but the mountainous nature of East Central Europe apparently held little attraction for these fen dwellers, as no evidence exists of organized or group colonization by them in that area (Thompson, 1928, p. 572).

Another type of surveyed village is to be found in the forest of east central Europe, especially in the valleys. Similar in appearance to the Marshhufendörfer discussed above, these Waldhufendörfer are oriented along the axes of valley floors with long lots extending back up the mountain sides. A notable difference between the two is that the forest village lots often take on sigmoid curves, whereas those in the reclaimed marshes are straight. Furthermore, the lots in the forest villages are "infinitely longer than they are wide," ranging in length to two or three kilometers and only "several dozens of meters in width" (Meynier, 1958, pp. 118-120). In both cases the linear arrangement combined the single farmstead with a village community. Though often
attributed to Germanic folk, Mutton states that the Waldhufendörfer were established in the Ostmark and the Mark of Thuringia by Slavonic Marcomanni tribes, as in the Czech lands of Bohemia and Moravia (Mutton, 1961, pp. 385-386). Thompson, following Meitzen, says that the whole practice goes back to the Hollanders who settled in the Weser marshes in 1106 (Thompson, 1928, p. 511). There are a number of unanswered questions in the matter, however. Thompson himself noted the reluctance of the Lowlanders to settle in the mountain valleys, even when they had been especially invited. Moreover, these colonists were specialists in implanting their villages in the marshes, fens, and moors, with their distinctive straight fields. Kretschmer, writing two decades before Thompson, indicates that these are separate and distinct types of villages. He states that the forest villages which rapidly expanded in the 12th and 13th centuries in the German Mittelgebirge (e.g., the Black Forest, Odenwald, Spessart, etc.) and especially in the Bohemian and Moravian border mountains, go back to the time of Charlemagne, and are first identifiable in A.D. 793 (Kretschmer, 1904, p. 380) (Fig. 4).

The marsh village, found in coastal and riverine marshes from the Schelde to the Elbemouth was first introduced into Lower Germany in A.D. 1106 (cf. p. 27 above.). Meynier acknowledges the hypothesis of the extension of the marsh or dike village into the mountains, "but nothing
justifies this theory," since there are forest villages anterior to the draining of the marshes in the 9th century (Meynier, 1958, p. 119).

Brünger summarized some of the basic sources of the long-standing controversy concerning the relative ages and origins of the Marshhufen- and Waldhufendörfer. The literature is voluminous, and the question is not likely soon to be resolved (Brünger, 1961, pp. 71-72).

Marshhufendörfer are thus known in Frisian lands as early as the 8th century. This form diffused into the borderlands of East Germany in the late 11th and early 12th centuries. Waldhufendörfer are reported in East Central Europe in the late 8th century, but with no apparent connections in the Low Countries. The strip system may well have multiple origins in Europe. The evidence indicates considerable antiquity.

C. ARPENT LOTS AND THEIR DISTRIBUTION IN THE NEW WORLD.

The arpent system is found wherever the French settled in the New World, from the Caribbean, up the Mississippi valley to the Great Lakes, Oregon, Canada, and Maine. In the United States it was first established along the Lower Mississippi, especially in the vicinity of New Orleans (Fig. 9). French settlers located on navigable waterways in the early days, using streams such as the Mississippi, Lafourche, Teche, Vermilion, Ouachita, and Red
as highways. Much of the area settled by the French came to be termed "Overflowed Lands" by the General Land Office. The only high ground in these areas was the high bank or natural levee of the streams. The intervening swamps and backcountry saw little or no development until much later (latter 18th century). With the Acadians, the arpent system spread along the previously unsettled waterways of the prairies of southwest Louisiana. The Baron de Bastrop and the Marquis de Maison Rouge attempted to organize settlements in the area of present-day Morehouse and Ouachita parishes. While the schemes of these two never came to fruition, arpent lots were surveyed in these areas of northeast Louisiana and subsequently granted to the people who settled them.

Due to political and economic problems in the Mother Country, little land was settled during the period when France first held Louisiana. The settlements that were established were founded on the Lower Mississippi. Before the first surveyor general was appointed in 1795, under the Spanish regime, very few surveys were made. Those surveys made under the French government were often not accompanied by plats, and it does not appear that they were sanctioned by public authority. Surveys were only occasionally ordered, and frequently not until many years after the concessions were made and the claimants had possession of their lands. Thus, when a lieutenant governor ordered surveys to be made,
they were generally of lands granted by his predecessor (Stoddard, 1812, p. 248).

When Louisiana was ceded to Spain, the new, liberal land granting policy along with increasing immigration of Americans encouraged new settlement. The Spaniards used different systems of land tenure and surveying elsewhere in the New World, but followed the system established by the French in Louisiana. They even continued the use of the arpent as a unit of measure. It should be noted that the granting of patents was a process involving many steps (see below, p. 41f), and very often under the lenient Spanish rule, lands were never officially surveyed, and perfect title was never issued.

When the government of the United States began surveying previously unclaimed lands, with the north-south-oriented geometrical grid (after 1803), they discovered that the inhabitants of the "overflowed lands" would not buy lands so divided, and the government was obliged to perform a modified arpent survey. These lots are found in small areas along the western Gulf Coast, along the Mississippi, in the Atchafalaya Basin, and elsewhere in previously unsurveyed areas along navigable streams (Fig. 3). These regular lots are a variant of the older system previously used by the French and Spanish. Since they were strictly regulated in size and shape by an act of Congress, used a different unit of measure (the acre), and were surveyed
Aerial photograph of arpent lots surveyed along Bayou Teche, near Cecelia, in St. Martin Parish (T8s, R6E, Louisiana Meridian). The 40-arpent road can clearly be seen paralleling Bayou Teche in the right (eastern) part of the photograph. The 40-arpent road is about 1½ miles from the bayou. Rectangularly subdivided lots can be seen in the lower right (southeastern) part of the photograph. Photograph courtesy Edgar Tobin Aerial Surveys, San Antonio, Texas.
before settlement, the term "American long lot" is proposed for this variant of the older form. Figures 5, 6, and 7, and Plate 1 indicate the respective appearances of the arpent system and the American long lot as they appear on original township plats in the Louisiana State Land Office in Baton Rouge.

D. LAND LAWS AND GRANTING PRACTICES.

In theory, land was to be granted in strips which were to be later surveyed perpendicular to streams, and all strips were to be adjoining. Most of these grants were made under Spanish rule, and the Spanish issued a series of land laws. O'Reilly, Gayoso, and Morales were notable publishers of such laws.

When Spain assumed control of Louisiana in 1769, it tried to attract settlers to the area. The O'Reilly decree of February 18, 1770, setting out detailed rules for all land grants, furnished guidelines for all future Spanish land ordinances. It and all succeeding ordinances specified that to be granted land a person had to be of the Catholic faith and also married, or a farmer, or have property of some kind, or have lived in Louisiana while farming someone else's land for four years. Those who qualified could be granted,

if it is on the bank of the Mississippi, four, six, or eight arpens, and if it is at any other place, the quantity which they shall be judged capable to
FIGURE 5

Example of arpent lots in St. James Parish along the Mississippi. Note the rectangular land division in the southwest part of the survey plat, in the back swamp. Original survey plat (1854) courtesy Louisiana State Land Office.
Portion of an original township plat, surveyed in 1837, which illustrates arpent system lots in St. Martin Parish (T8S, R6E, Louisiana Meridian). Note the 40-arpent line paralleling Bayou Teche (cf. Plate 1). Rectangularly surveyed lots appear in the southeast. Township plat courtesy Louisiana State Land Office.
Example of American long lots in juxtaposition with rectangular surveys along Bayou Petit Caillou in Terrebonne Parish. Note the square sitio grant on the eastern side of the township. The body of water in the southwestern portion of the township is Lake Boudreaux. Original survey plat (1832) courtesy Louisiana State Land Office.
cultivate, and which shall be deemed necessary for pasture for his beasts, in proportion according to the number of which the family is composed, understanding that the concession is never to exceed eight hundred arpens in superficies. (White, 1839, Vol. II, pp. 234-235)

During the first year of occupancy, the settlers were expected to construct suitable levees and canals (running parallel to the property lines) and to build and maintain a public highway at least 30 feet wide. Bridges 15 feet wide were to be constructed over canals and ditches.

Grantees were also expected to clear and cultivate the front of each of their concessions to a depth of two arpents within three years, or the lands reverted to the Crown. This stipulation was intended to prevent speculators from holding the lands for future sales. In some cases lands were confiscated for this reason (Holmes, 1969). During the three-year trial period, grantees were not allowed to sell or dispose of their lands.

Since legal problems had arisen from incomplete titles, notaries and post commandants were not to acknowledge any conveyance of land unless the grantor presented and delivered the title to the grantee. Furthermore, the metes, bounds, and other descriptions resulting from the title and the proces verbal of the survey were to be inserted. In spite of this ordinance, many settlers never perfected title to their lands.
1. HOW A GRANT WAS OBTAINED.

The general procedure for getting an "arpent grant" in Spanish Louisiana was similar to the granting of irregularly surveyed parcels in the Florida Parishes. First, the governor granted permission to settle. Then the petitioner submitted a petition in Spanish (requete) for a piece of land to the local granting authority—often the commandant of the local post. Unlike the irregular system (Chapter II) under which the settler located away from neighboring farms to minimize boundary clashes, the arpent strips were to form a continuous settlement of adjoining farms. The Spanish government felt that several advantages resulted from this agglomeration of settlers.

It shall not be permitted to any new settler to form an establishment at a distance from other settlers. The grants of land must be made so as not to leave pieces of vacant ground between one and another, since this would offer a greater exposure to the attacks of Indians, and render more difficult the administration of justice, and the regulation of the police, so necessary to all societies, and particularly in new settlements (Manuel Gayoso de Lemos, New Orleans, 9th September, 1797, in White, 1839, Vol. II, p. 233).

Further, this close proximity of neighbors would allow the inhabitants to lend material support to one another, and encourage the establishment of social ties so necessary to building a new community.

In the event that local conditions such as ill-drained lands or the necessity for surveying shallow pieces
of land on the inside of a meander, this undesirable land could either be sold or divided equally among the nearest neighbors who would agree to maintain levees, roads, and bridges, in the prescribed manner (Fig. 8).

Grants to individuals were of two types: special and general. In the case of special grants, the metes and bounds of the land were specified in the grant itself. The general grants, however, were more common and consisted of a permit to settle a certain amount of land, but its location and boundaries were not stated. Such grants came to be known as "floating" or "running" grants.

Under both Spain and France, land tenure was alodial—that is, the tenant paid no quitrent for his land and owed only liege homage and fidelity to the granting country. Once title was perfected, the property belonged entirely to its owner. It was necessary, however, for the grantee to fulfill all the provisions of the law before a patent or title to a segment of crown lands was issued. According to Stoddard, the land laws of both Spain and France were theoretically oppressive and extortionate (Stoddard, 1812, p. 252). The concession had to pass through four to seven offices before complete title could be obtained, and the surveyor's fee could, and did, in some cases, amount to more than the value of the conceded lands. The grantee was expected to perfect title to his land within six months or forfeit the land plus whatever expense
A. Fitz method of surveying arpent lots.

B. Convex side of a meander.

C. Concave side of a meander.

FIGURE 8
he had incurred.

During the French regime, no accurate surveys had ever been made and many boundaries were in dispute. Therefore, don Alexandro O'Reilly appointed a surveyor for each district in the Louisiana colony. The surveyor's duties included the determination of exact boundaries for each piece of property (Prichard, 1948, p. 28).

The Spanish system was essentially that which had been introduced by the French (Prichard, 1948, p. 135). Several editions of Spanish land laws were published during the stewardship of Spain in Louisiana (above, p. 36). O'Reilly issued twelve articles regulating grants and concessions in the Island of Orleans and the Posts of Opelousas, Attakapas, and Natchitoches. Gayoso and Morales also published land laws, but they were essentially elaborations of O'Reilly's. Of Morales' thirty-eight articles, the first nine are the same as O'Reilly's and the last twenty-nine either explain these or regulate grants in the Opelousas, Attakapas, Mobile, and Pensacola areas. These laws were never carried into full effect. They were met by a storm of protest in Louisiana, and since it was Spain's plan to make an agricultural colony, harassment of the settlers was held to a minimum. Thus, when Louisiana became part of the United States, settlers were found having claims based on everything from occupation and cultivation for a ten-year period (squatters' rights) to the full Spanish patent (see Appendix
III, p. 191). The quantity of land actually granted in Lower Louisiana (the Isle of Orleans) before United States possession can never be determined, since Spanish claims were not recorded until surveyed, and in 1803, a vast number of unextended concessions were scattered among the settlers (Stoddard, 1812, p. 259). Stoddard estimated that more than 3,000,000 arpents of land were claimed in Lower Louisiana, with the vacant lands found mostly in the districts of Attakapas and Opelousas, and on the Red and Ouachita rivers (Stoddard, 1812, p. 264).

Neither the French nor Spanish governments considered public lands as a source of revenue, and generally allocated small tracts of land. William Darby, one of the keener observers of Louisiana in the early years of the 19th century, gives a useful account of the procedure for obtaining a Spanish patent (Darby, 1818, p. 299).

1. The prospective settler filed a petition (requête, or "ricket" to the American settlers) in the office of the district commandant, indicating the quantity of land desired, sometimes the location preferred, the amount for grazing purposes, the number of persons in the applicant's household (including slaves) and the amount of livestock owned (American State Papers, Public Lands, Vol. IV, p. 84).

2. The commandant verified the statements in the requête and determined whether the desired area was indeed vacant.
3. If the statements were true and the land was vacant, the requête was forwarded to the governor-general with the commandant's recommendation.

4. If the governor-general approved, he ordered the surveyor general to cause a survey and plat of the proposed grant to be made (Monette, 1855, p. 114). (See below, "The Model" for the survey procedure.)

5. Once surveyed, the plats and other original documents were deposited in the office of the Secretary of the Treasury and annually bound into a record book with an alphabetical list. The title was attached to the certified copy along with the survey plat (White, 1839, Vol. II, p. 238). These documents constituted a concession, or permit to settle, and served as a non-transferrable title which was good for three years. If the grantee had fulfilled the requisite conditions (i.e., building and maintenance of levees, bridges, and roads, and land clearing), at the end of the period he was issued a patent, or fee simple title, by the local commandant (American State Papers, Public Lands, Vol. IV, p. 85). A copy of a complete patent is appended (p. 191).

In theory the system was an excellent one, but it was so involved that many of its facets were bypassed, altered, or ignored. Concessions which were to be made only by the governor-general were often granted by the district commandant or other local official. Grants were rarely
surveyed, due either to the expense or the lack of qualified surveyors. Usually no further effort was made to perfect the title after the order of survey was issued. Many settlers merely squatted on the lands they wanted. Due to the lack of surveyors, new settlers often encroached upon their neighbors' claims, causing frequent boundary squabbles. These proliferated, especially after the United States took over. Settlers were reluctant to have their lands surveyed by the United States for fear of offending the lax Spanish government, which they expected to be restored at any moment, or for fear of being discovered with more land than the order of survey stipulated. Under Spanish law, persons were given half the selling price of such illegally obtained land if they informed on the violators. Thus it is not surprising that the United States deputy surveyors were sometimes watched over gun barrels as they attempted to survey private claims.

E. THE MODEL.

The survey (above, p. 23) was "in the form of a parallelogram, forty arpents deep, from front to rear, this mode, which diffused from the banks of the Mississippi, was pursued in all other parts of the country," using the arpent of Paris in all cases (Darby, 1818, p. 6). The Commissioner of the General Land Office, in his Report of 1873, includes the report of the Surveyor General of Louisiana. That
gentleman in turn quotes an "experienced surveyor" on the subject of French and Spanish surveys:

It was the general custom of the surveyors employed by the French or Spanish Government, in locating tracts in the province of Louisiana, having a depth of forty arpents, merely to survey the fronts of such tracts, and to indicate the courses of the side lines by planting bourns or posts at equal intervals from each other, and at short distances from the river, without actually running and measuring the full depth of said side lines, and without closing the survey by running the rear lines between the extremities of such side lines; and that in tracts having greater depth than forty arpents, or a depth extending to another river, lake, or natural boundary, it was their custom, invariably followed, as far as I can ascertain after careful examination, to measure to the forty-arpent points on such side lines, and then, at short distances therefrom, to establish bourns or posts to exhibit the prolongation of the side boundaries (Gumm, 1968).

The surveyor used a chain twenty-two yards long and a compass. According to Bouchon, Surveyor General of Louisiana in 1820, prior to cession to the United States, the French and Spanish records of survey (proces verbaux) were reported entirely according to the measures of Paris; Spanish measures had never been used (American State Papers, Miscellaneous, (G. and S.), Vol. 2, 1834, p. 743).

It was necessary that the surveyor fix the boundaries in the front and the rear in the presence of the local judge (syndic) and the general intendant of the district as well as the two adjoining neighbors. All four were to sign the proces verbal, or survey record (White, 1839, Vol. II, p. 238). The proces verbal was to be attached
to the survey plat and the requête and returned to the intendant with certified copies of all documents.

In surveying private claims under the arpent system to confirm titles for United States records, American surveyors were largely on their own, for no instructions had been issued from higher authority. Gideon Fitz, Principal Deputy Surveyor of the Western District of Louisiana, therefore consulted with Charles Trudeau, the former Spanish Surveyor General, and issued a set of rules dated October 2, 1810. These were accompanied by two diagrams which were to be incorporated into field notebooks for reference (see Fig. 8a). The survey was to commence at point "A" and proceed thence to point "X". This line was then to be extended to point "B". Returning to point "A," the surveyor was to measure a line at right angles to line AB to point "C". From point "C," the distance to the watercourse was to be measured. Returning to point "C," the surveyor was to measure to point "D." Returning to point "C," the surveyor was to proceed at right angles to line AB to point "E," and so on along the bayou. Similar to the Spanish practice, back lines were not to be surveyed, their distance and angle being calculated from the known data (Gideon Fitz to Mathew Stone, John Dinsmore, and Samuel Cook, October 2, 1810, Records of the Western District). Where large bends in streams were encountered, the procedure was to direct the side lines of all tracts in the meander to
a common center or point halfway between the two extreme points on the concave side of the stream (see Figs. 8b and 8c). The street pattern of New Orleans is an excellent modern example of the legacy of this practice (see Figs. 9 and 10). In northern Lafayette Parish, such a series of radiating lots is readily discernable from the air at the present time, as illustrated in Plate 2 and Fig. 11. The area is locally known as "l'Éventail" after its resemblance to an old-fashioned folding fan.

F. THE AMERICAN LONG LOT.

1. GENERAL.

After Louisiana was ceded to the United States, the government proceeded to authenticate the private claims granted under the French and Spanish administrations. Before new lands could be surveyed and sold, the private claims had to be surveyed and platted. Most private claims had never been surveyed and many settlers had lost the few documents which gave them permission to settle. The chronicle of the surveys of private claims makes up one of the more dismal chapters in the history of surveying in Louisiana.14

When the government began to survey new lands before opening them for sale (a new idea in Louisiana, since settlement had almost always been prior to survey under France and Spain), the contract surveyors were to divide the land into the checkerboard divisions which were to eventually cover
Original survey plat (1832) of arpent holdings in the area of the present city of New Orleans. The City of New Orleans appears in the northeastern part of this plat. Survey plat courtesy Louisiana State Land Office.
Original survey plat of the street plan of New Orleans following the arpent survey lines (cf. Figure 10). The words "Undergrowth" and "Pasture" appear in the vacant areas on the map. The oldest part of the city is characterized by a rectilinear street pattern, and is shown in the northeast part of the plat. Survey plat courtesy Louisiana State Land Office.
L'Éventail. A series of radiating arpent lots in northeasternmost Lafayette Parish named for its obvious resemblance to an old-fashioned folding fan. The rays of this tract are clearly visible from their apex at ground level. The southernmost ray, running nearly due east-west, is Louisiana Route 726. To the north and east, the limits of the tract are formed by Bayou Carencro, which flows into Bayou Vermilion, running to the south. Compare this plate with the original survey plat, Figure 11. Aerial photograph courtesy Edgar Tobin Aerial Surveys, San Antonio, Texas.
L'Éventail. Radiating arpent lots in northern Lafayette Parish. Compare this original survey plat (1855) with a contemporary aerial photograph of the same area (Plate 2). Survey plat courtesy Louisiana State Land Office.
most of the state. In the alluvial areas, however, where the natural levees were the best land, where the backlands were subject to inundation, and where the tradition was strongly French, inhabitants simply refused to buy lands which were so divided. The new patterns were counter to the established culture, disrupting the familiar long settlements with their attached fields running perpendicular to the streams, the main transportation arteries. They complained that much land they might be forced to buy under the American system might well be useless, inundated land. The streams were still the major thoroughfares and the few existing roads in the alluvial country followed primarily natural levees. The strongest complaint voiced, therefore, was that people living away from streams would have difficulty getting direct access to transportation routes.

Secretary of the Treasury Gallatin, in charge of territorial surveys at this time, was aware of the opposition to the rectangular survey. He therefore sent instructions to Surveyor of Public Lands South of the State of Tennessee, Briggs, concerning the survey of lands in the Territory of Orleans. Since all previous grants had been expressed in arpents, both as a superficial and as a linear measure, Briggs was to ascertain the contents of an arpent in English superficial perches and feet, and also the measure of length in English perches and feet which is understood by an arpent in front (Gallatin to Briggs, July 22, 1805, Commissioners'
Letters, U.S. Land Office Archives, p. 6). Gallatin then instructed Briggs to meander the principal streams,

... especially the Chafalaya, the Opelousas [Bayou Boeuf?], Attakapa [Bayou Cocodrie?], and Teche, and surveying on each margin and in the best manner which the nature of the country will admit, tracts of 160 acres and having as much front in proportion to their depth as has been usual in Lower Louisiana (Gallatin to Briggs, July 22, 1805, Commissioners’ Letters, U.S. Land Office Archives, p. 6).

At the same time Gallatin enjoined Briggs to direct his assistants:

... to make a very correct return of the nature and growth of the soil, of the depth of the rivers or bayous, of the elevation of the waters during the inundation and of their greatest depression and particularly of the depth of the lands not liable to be inundated or which may be protected by a low levee (Gallatin to Briggs, July 22, 1805, Commissioners’ Letters, U.S. Land Office Archives, p. 8).

At length, Congress, in the face of the strong opposition and refusal to buy any but long-lot divisions, was forced to make an exception to its survey laws. An Act of Congress of March 3, 1811, provided that the two principal deputy surveyors of the Territory of Orleans:

... be authorized, in surveying and dividing such of the public lands in the said Territory (Island of Orleans) which are or may be authorized to be surveyed and divided, as are adjacent to any river, lake, creek, bayou, or water course, to vary the mode heretofore prescribed by law, so far as relates to the contents of the tracts and to the angles and boundary lines, and to lay out the same as far as practicable, of fifty-eight poles in front and four hundred and sixty-five poles in depth, of such shape, and bounded
by such lines as the nature of the country will render practicable, and most convenient. Provided, however, that such deviations from the ordinary mode of surveying shall be made with the approbation of and conformity with the general instructions which may be given to that effect, by the surveyors of the public lands south of the state of Tennessee (Local and Temporary Land Laws of the U.S., Vol. I, 1880, Doc. 45).

A later act was passed which allowed tracts of 20 x 40 acres to be surveyed, thus providing eighth sections rather than the previous quarter sections.

Thomas Freeman, who succeeded Briggs as Surveyor of Public Lands South of the State of Tennessee, followed this congressional act with a detailed set of instructions (Thomas Freeman to Gideon Fitz, Principal Deputy Surveyor, Southwestern District, Orleans Territory, June 15, 1811, in Carter, 1940, Vol. 9, pp. 940-943). Freeman instructed his principal deputies first to take an accurate survey of the margins of the watercourse in the area in which the surveys were to be extended, and then to draw a large-scale map.

2. THE MODEL AND PROCEDURE OF SURVEY.

On the map, straight lines were to be drawn in the general direction of flow of the watercourse, and the lengths of fronts of tracts were to be laid off in lengths of 58 rods, or 14.50 chains (947 feet). Through these points, straight lines were to be drawn at right angles to the first line drawn, extending back 465 rods, or 116.25 chains (7,672.5 feet). This gave the same proportions front
to side as the old 5 x 40 arpent French and Spanish grants, but three feet shorter in front and eight feet shorter in depth. The tract thus defined was to be closed by drawing a back line normal to the sidelines, or parallel to the first line. When the watercourse was straight or nearly so, the back line from one tract could be extended to become the back line of several adjoining tracts.

Since the watercourses were extremely irregular, the letter of the law could not be followed exactly. Often the sidelines of a given tract were not of the same length, and the dimensions and contents of the new American long lots frequently differed from each other. Such minor deviations from the law were to be in favor of the neatness and convenience of the survey (see Fig. 12). Where the stream was essentially straight, minor irregularities were ignored. Where meanders were encountered, however, the deputies were directed to draw in and survey the lines converging, or diverging, as the case required (see Figs. 8b and 8c). On the concave side, lines were to converge to prevent the tracts from interfering with each other (Fig. 8c), and they were to diverge in the convex side (Fig. 8b) to avoid small angular vacancies which would remain if side lines were drawn parallel. In such cases, back lines were to be drawn at right angles to one of the side lines, and at 465 rods (7,672.5 feet) from the watercourse or front. Tracts which had divergent side lines would thus be larger than the law
Thomas Freeman's diagram (1811) illustrating the method for laying out American long lots. In the upper right-hand side the diagram illustrates how lots were to be numbered up- and downstream from a tributary bayou. Witness trees appear in the extreme right and lower right of the Figure. The original of this diagram is preserved in the Louisiana State Land Office. Diagram courtesy Louisiana State Land Office.
stipulated, and tracts with converging sides would contain less acreage than required, but the length of the fronts could be extended to compensate for the shortened depth, so that such lots might more nearly conform to the required area. The government wanted primarily to maintain the 465 rod depth, and was willing to grant leeway on the frontage to keep the depth as nearly constant as possible for the sake of neatness and uniformity. The policy of granting extra frontage to compensate for lack of depth on the concave side of the meander had been part of the old Spanish procedure as well, but few persons wanted the wedge-shaped lots on the inside of the meander.

The whole procedure was thus to be laid out in completed plan before the surveyor went into the field to transfer the lines from the plan to the ground. While the letter of the law was to subdivide the lands into parcels of 58 x 465 poles, the spirit of the law—the making of manageable plots approximately that size, but which were as regular and uniform as the lay of the land would allow, and accurately surveyed, was more important.

The first and principal object of the surveyor should be to have his lines accurately run, distinctly marked, and the contents of his survey correctly ascertained. It is much more desirable to both the Government and the purchaser, that the lines of a tract should be plainly designated, than its dimensions should be precisely a given number of chains and links. Should one tract occupy a larger or better front on a water course than another, it will be more valuable, and consequently sell for more than the other (Carter, 1940, Vol. 9, p. 941).
The American long lots are often conformable with the rectangular surveyed lots—i.e., squared off wherever possible to tie into the rectangular surveys along section or township lines (Fig. 13). 16

The fifth section of the Act, which enabled surveyors to use the long lot in the United States, provided that a person who had a French or Spanish grant which had been confirmed by the United States, or other confirmed claim which bordered on any river, creek, bayou, or watercourse, and which did not exceed a depth of 40 arpents, would be entitled to buy any vacant tract adjacent to, and back of his own tract, not exceeding 40 arpents in depth, nor in quantity of land exceeding the amount in his own tract. In the event that this could not be effected due to a meander or other obstruction, the surveyor was to divide such land as was available in the most equitable manner he could. In no case was a preemption, or "second concession" ("back concession"), to extend so far back as to include lands fit for cultivation on another stream. Settlers had three years to claim these second concessions from the date of the Act (Act of Congress of March 3, 1811, No. 710, Sec. 5).

A system of numbering the sections of the rectangularly surveyed lands had been devised and put into effect, but the Act of March 3, 1811, had no provision for numbering the tracts surveyed under the second section of that act.
FIGURE 13

Terrebonne Parish highway map illustrating American long lots surveyed to conform with rectangular surveys. Note the unsurveyed area in the southwestern portion of this area (Ward 9). Louisiana Department of Highways.
Freeman considered this a defect which, if not remedied, would cause great trouble and inconvenience. He recommended that:

... the tracts be numerically numbered from some well known point or land mark such as a Bluff, the junction of some Bayou or water course or the intersection of the meridians already run. Thus lot N. 1. 2. 3. etc. as it may be above or below the land mark (naming it) and on the right or left of the water course as it may be situated (Thomas Freeman in Carter, 1940, Vol. 9, p. 942). (Fig. 12)

The side of each lot was to be marked with a strong squared picket, noting its distance from the watercourse. The pickets set firmly in the ground, were to be numbered on each side with a marking iron. The position of the picket was to be marked with the number of the lot in which it was found. At the termination of each side line a picket was to be set in the ground and the distance and bearing to two trees ("witness trees") was to be noted (Plate 3). The trees were to be numbered with their respective lot numbers. The whole was to be carefully noted in the surveyor's field book.

Freeman also listed other contingencies, such as the problem of what to do if two streams were to be surveyed where the 465 rod depth would encroach on the good land adjacent to the other streams. In this event, the land was to be divided equally between the fronts of each stream. In the event that the American long lot divisions lay between private claims or tracts already surveyed, the lots
A portion of a witness tree into which pertinent township or section-corner information has been burned. Witness trees were those chosen as close to the corner as practicable. Their bearing and distance from that corner were carefully recorded in the field notes. This fragment is displayed in the Louisiana State Land Office in Baton Rouge.
might be numbered from one of the former surveys to the other and whatever fraction should be left over was to be annexed to the American long lot division without running a side line between.

3. SURVEYING DIFFICULTIES.

The survey records and the official correspondence are filled with complaints of the poor quality of surveying and inaccuracies, but in fairness to the surveyors, the field conditions with which they had to contend should be noted. Floods, thick vegetation, and other problems slowed and sometimes stopped the surveys.

The whole face of the country between the Mississippi and the Washita Rivers, about 40 miles in width, opposite this place, has been inundated to an uncommon depth this year. The whole cultivation of cotton, corn, &c. in these low grounds has been wholly destroyed, with 2 or 3 solitary exceptions - the waters have not yet so far subsided as to admit the return of the slaves to those plantations. The survey of claims in these low lands cannot be commenced before the first of September and even then, few men can be found hardy enough to withstand the poisonous effects of half-dried mud, putrid fish and vegetable matter, almost impenetrable canebrakes and swarms of Mosketoes with which the low lands abound after the fall of the waters. (Thomas Freeman to Albert Gallatin, July 15, 1811. Surveyor General's Letters, August 31, 1805 - April 15, 1831)

The marsh lands were as bad or worse. According to Deputy Surveyor William Elms:

... our hands were cut by cutgrass, and we were exhausted by the hard work: the marsh, like those in
many parts of the country is filled with cutgrass from 4 1/2 to 7 feet high; the blades on each side are as sharp as razors and make bad cuts which do not heal readily, as my men can testify. Tired within a short period of time and with sore hands we returned to camp (Records of the Western District, quoted in Downs, 1960, p. 58).

G. ASSOCIATED SETTLEMENT PATTERNS.

The arpent system and the American long lot system give rise to distinctive patterns in rural and urban landscapes in Louisiana. The primary purpose of this study is to deal with the survey systems themselves, but some of the more notable associated settlement patterns are mentioned below.

Though survey systems may be mapped from the ground, it is impossible to observe them within the environment without actually flying over the terrain or studying air photographs. The most outstanding characteristic of the arpent system (including the American long lots) is the orientation of the fields to the watercourses, though some few front on roadways. The individual settlements are narrow, attenuated chains of buildings locally forming nodes with long cultivated strips trailing out behind. It is difficult to tell where one agglomeration ends and the adjacent one begins (Plates 4 and 5). The individual farmstead usually consists of the farmhouse fronting on the stream, with the outbuildings strung out behind. Drainage ditches were constructed and maintained by the inhabitants,
especially in the case of sugar planters. Except on meanders, fields in the arpent system run perpendicular to the streams, or parallel to the long axis of the lot, with furrows running the same way. As medieval farmers had discovered, cultivating long narrow strips of land reduces the amount of plow turning, and in Louisiana, it helps drain surplus water toward the backland. Fences, used to separate holdings, are often left untended to grow up in trees and woody shrubs. From the air, (Plate 4 and Fig. 14) these lines are effective indicators of individual long fields.

Though the most obvious patterns associated with arpent surveys are rural, a number of striking elements have become urban. In cases in which the line settlement has expanded away from the stream on which it fronts, the street pattern has often developed along the same lines as the gross rural pattern, but in finer texture. The classic example of this is the city of New Orleans. As the city grew beyond the confines of the original rectilinear pattern and expanded into the arpent-surveyed surrounding area, the streets followed the standard pattern of arpent lots on the concave side of a meander. Cross streets followed arcs concentric to the meander of the Mississippi (Figs. 9 and 10).

When cities begin to grow beyond their limits into formerly agricultural areas, the most convenient way to divide the newly acquired lands is according to existing
Air photograph illustrating arpent lots along the Mississippi just south of Baton Rouge. Note the shrubby growth along the property lines.
Arpent lots adjacent to the Mississippi just south of Baton Rouge. These are plantation fields, planted in sugar cane. Lines of trees are along drainage canals.
A portion of the Iberia Parish road map, northeast of New Iberia, illustrating the classic pattern which accompanies the arpent system of surveying. The 40-arpent road runs parallel to Bayou Teche. Compare this map with Plate 1 and Figure 6, which show similar patterns upstream.
cadastral divisions. A case in point is the adherence to the arpent pattern of new subdivisions south of the city of Lafayette (Lafayette Parish, T9, 10S, R4, 5E, Louisiana Meridian). The arpent strips which run in a northwesterly direction away from Vermilion River terminate at U.S. Highway 167, which approximates the 40-arpent line. Some of the suburban divisions consist of a single street extending the 40-arpent distance between Highway 167 and the Vermilion (Grand Glade Subdivision).

The native populace of French Louisiana where the arpent system prevails take little cognizance of the cardinal directions, and rarely use them to orient themselves. In giving directions they will refer to right and left, or la bas (downstream) and la haute (upstream). Equally frequent are "front"—land nearest the stream, and "back"—land toward the backswamp or away from the stream. Compass bearings are rarely understood and have little application in any case, since the major roads in these areas are stream-oriented. The same concept has been carried into urban areas. For example, natives of New Orleans refer to uptown or downtown depending on whether the area referred to is upstream or downstream from the foot of Canal Street.

Louisiana was obliged to change some of the old ways on becoming one of the United States. As the system of American weights and measures was introduced, some, but not all standards were readily accepted. The Surveyor General
of Louisiana in 1820 noted the satisfaction of the French population with the American weights:

... but all, especially those in the country, find it difficult to accustom themselves to the measures of length and the superficial measures, and I think they will be long in doing so. This depends upon long contracted habits, and they cannot change these habits at once. One must have gained great facility in calculation to be able to comprehend the new superficial measures, at all times more difficult than the measures of length or weights, especially when he sees no advantage to be derived from them (Bouchon, Surveyor General of the State of Louisiana, American State Papers, Miscellaneous, Vol. 2, (Gales and Seaton), 1834, p. 743).

Though the acre is making inroads, to this day advertisements may be seen in the newspapers of French Louisiana for land by the arpent, frequently with water frontage. Plate 6 shows lots of this type along the Mississippi in West Baton Rouge Parish for industrial sites.

Subsequent division of arpent lots finds its roots in Roman law, specifically the law of coparcenary, or equal inheritance. Under this rule, land was divided equally among all the heirs. In Louisiana, the most equitable means of subdividing real estate was to divide the land lengthwise so that each heir would receive equal proportions of each type of land from the high, dry frontland to the low, wet backland. Whereas the original grants left the individual homesteads rather widely separated, subsequent division of the land as indicated above has made the present homestead spacing much closer. Indeed, some
Commercial and industrial sites along the Mississippi subdivided into long lots. West Baton Rouge Parish. Photograph by the author.
lands have been subdivided to such an extent that these long, extremely narrow strips are of little use.
NOTES TO CHAPTER I

1Some of the very early grants were about as wide as they were deep, but subsequent division was rendered the lots pronouncedly rectangular.

2A glossary of terms of infrequent or unusual usage is appended, p. 193.

3Acadian racetracks are still very much in evidence in the vicinity of Lafayette. They are run from distances of four arpents (about 256 yards) to as much as eleven arpents (about 708 yards). Tracks are located between Lafayette and Abbeville, Lafayette and Breaux Bridge, Lafayette and New Iberia, and in the town of Carencro. An ad in the Lafayette Advertiser (August 10, 1969) featured That's Oto and Long John in a five-arpent contest (Morgan G. Hall, personal interviews July 7 and August 10, 1969).

4The "manors of Dutch measurement" were also variously called Flemish—mansos ad mensuram Flandrensium, mansus regales, or Königshufen.


6This document is printed in several German sources, and the standard English translation appears in Frederick A. Ogg (ed.), 1907, A Source Book of Mediaeval History, pp. 330-333.

7See the edition of Francis J. Tschau, Chronicle of the Slavs. New York: Columbia, 1935, p. 222. This rope survey appears to be the ancient Hebrew system of allotment (funiculum) and was probably similar to the "rope stretching" of the ancient Egyptians. For a Biblical account, see Amos 7:17. The Egyptian techniques are treated in Wreszinski's Atlas zur altägyptischen

8Raoul Blanchard. *La Flandre*. Lille: L. Danel, 1905, pp. 423-427, treats similar “street villages” of Flanders, citing the 120,000 quadrangles of Ecloo and Evergam (Belgium). He notes the difficulty in determining where one such agglomeration begins and the other ends.

9Place names serve as indicators to the early distribution of Flemish settlements in East Germany (Thompson, 1928, pp. 555-556). Thompson gives the names of the early settlements and the origins of the settlers.

10Elsewhere in the Americas the Spanish instituted circular surveys, square sitio grants, and long lots of a different type, using the vara as the main unit of measure.

11These laws are translated in several available publications, notably White, 1839, and Dart, 1928.

12If this practice was ever evident on the landscape, there is no evidence of it in 1969. Lands which were of value have been cleared as far as feasible. Lands of little or no value have long since been allowed to revert to wild vegetation, if indeed such were ever cleared.


14The theses of Downs (1960) and Elliott (1961) treat these problems in considerable detail.

15The original of this diagram is kept in the Louisiana State Land Office, 6th Floor, Capitol Building, Baton Rouge.

16See for example T16, 17S, R15E, Louisiana Meridian, Terrebonne Parish; T14N, R13E, Louisiana Meridian, Tensas Parish, and T3N, R6E, Louisiana Meridian, Concordia Parish. See also Fig. 10.

17Louisiana Highway 1 between Napoleonville and Thibodaux is an excellent example of this phenomenon.

18A smaller scale example may be found in the town of Thibodaux (Lafourche Parish, T15S, R16E, Louisiana Meridian).
It was the usual practice to establish a road forty arpents from the stream on which the lots fronted. This road ran roughly parallel to the stream, but often was somewhat irregular due to the irregularities of the back property lines (see Plate 1 and Figs. 6 and 14). Less frequently an eighty-arpent road was constructed.

The following ads appeared in the Lafayette (La.) Sunday Advertiser, September 1, 1968, p. 35:

3 ARPENTS LAND ON PONT DE MOUTON RD. Deep Well, Call ...

PRIZE ACREAGE
Estate Property 120 arpents choice location in Lafayette Parish.

9 Arpents, near Cankton.

8.66 Arpents, St. Martin Parish, near Lafayette Parish line, Bayou frontage. Off Teurlings Road.
CHAPTER II

IRREGULAR SURVEYS

A. GENERAL.

An irregular survey is defined as:

... a closed survey around a property. Its description identifies a point of beginning, gives the sequences of distances and directions, identifies the angle points, and notes the fact of return to the point of beginning (McGraw-Hill Encyclopedia of Science and Technology, 1960, Vol.13, p. 329).

This definition implies the survey of lines from point to point with the aid of a magnetic compass and graduated chain. This type of survey differs somewhat from the older metes and bounds survey. The metes and bounds survey bounds a tract of land delimiting it with a sequence of natural or artificial monuments along the line (stream, ditch, fence, road, etc.) (Webster’s International Dictionary, 1961, p. 1422). The irregular survey in Louisiana, in the last analysis, used a compass and chain. The metes and bounds system is by far the older method, and to a greater or lesser extent was used to demarcate tracts in the present state of Louisiana. When a grant of land was officially patented, however, by Britain, Spain, or the United States,
the amount of land to be allocated to the settler (patentee) was officially demarcated by a surveyor and delimited on an official survey plat which was filed with the appropriate governmental agency.

Both of these systems have the net effect of etching a pattern of generally irregular figures on the landscape. These consist of figures composed of straight lines, joining points, and curved lines following streams or ridges.

At its best, this type of survey consists of:

... pieces of land which were described by boundary lines of definite length and direction, between points identified by objects usually immovable, usually natural, though often marked by man, usually readily identifiable in the local landscape and if not "permanent" at least not ephemeral (Burrill, 1968).

Other names applied to the irregular survey include: metes and bounds, unsystematic survey, perimeter description method, indiscriminate location and indiscriminate settlement, and unregulated survey.

The irregular survey method lends itself to relatively rapid "survey" and settlement on the land, but has often been performed haphazardly, overlapping prior claims.

Irregularly surveyed tracts are unrestricted in shape, except by extant adjacent boundaries. Settlers who used this system laid out boundaries which gave the best available farmland as they saw it, or combination of land types. Valley bottoms, providing the most desirable land and the shallowest well depth to groundwater, were often settled
first. Most settlers included at least a small portion of upland for timber. Latecomers took what was left, so their claims were restricted in shape and size by the previous claims. When the irregularly surveyed portion of West Florida came under the control of the United States in 1811, much of the less desirable land was still vacant.

In Louisiana, the irregularly surveyed land is located in the Florida Parishes, north of Lake Pontchartrain and north and east of the Mississippi River. The best examples of these irregular tracts are in East and West Feliciana parishes with others in St. Helena, Tangipahoa, Washington and St. Tammany parishes (see Fig. 3).

B. EUROPEAN ANTECEDENTS.

Most of the land surface of the earth has been irregularly divided. This is particularly noticeable in the old Celtic areas of Europe. The irregularly shaped "Celtic fields" of western Europe and the British Isles are very similar to those found in the Florida Parishes. While it is tempting to equate the two, field patterns and systems of surveying are separate and distinct. Nevertheless, there may be a genetic relationship between the ways in which property is originally laid out and subsequently divided for use by its owner or user.

The origin of this survey system may never be known. In western Europe it apparently precedes writing and may be
the oldest way of subdividing land. Men evidently laid out their fields, selecting what they considered to be the best land. As settlement became more dense, the shape of an individual field was increasingly limited by the remaining available space. The earliest written accounts of property are most indefinite. By the Carolingian period, certain lords and especially the clergy described their domains (called terriers) by a purely empirical process: e.g., "The abbey possesses a forest large enough in circumference to graze fifty pigs" (Breton, 1968). By the latter part of the 7th century, however, the written charter had made its way from the continent to the British Isles and its application to land transactions was introduced into England. These charters were based on Roman models, but the tenurial practice, the law behind the English documents, is presumed to be local, traditional, and wholly Germanic (John, 1960, p. 1).

The following description of a metes-and-bounds property deed is from a grant of land by the Saxon king Edred to Aelfsig Hunlafing, dated A.D. 955:

... The estate at Alwalton consists of five hides and these are the boundaries: the posts of Ermine Street, then north along the street to the dyke as far as the Chesterton boundary, along the boundary to the fair brook, and then up along the brook to the narrow streamlet, and then south along the streamlet to the boundary, and so due south to the little hill and then still due south to the little thornbush and from the thornbush due west to the pollarded thorn, then back to Ermine Street (Robertson, 1956, pp. 57-59)."
Accounts of methods employed in measuring land in these early days are vague, but most measurement appears to have been done "by the rope" or funiculum. ³

C. TRANSMISSION TO THE NEW WORLD.

As Europeans settled the North American continent, they brought the type of survey system they knew best. Anglo-Saxons who settled parts of eastern North America prior to 1785 used the irregular system from New York State south through Georgia. They gradually worked their way west into Appalachia and south through those mountains across Alabama, Mississippi, and into the Florida Parishes of eastern Louisiana. The system continued westward, but its further progress is beyond the scope of this work. ⁴

The French were the first to make permanent settlements in the state of Louisiana, but their initial settlements were south and east of the area of irregular surveys. Though the Florida Parishes had once been French territory, they had passed to Spanish and finally to British control when settlement began. Thus the French system of surveying is found only minutely in the area (see Introduction, p. 13). Britain encouraged subjects from Great Britain and the English colonies to accept headright grants in West Florida. The largest grants were to officers (2,000 to 5,000 acres), while civilians who agreed to settle and cultivate might receive as much as 1,000 acres.⁵
Prior to homesteading practices, land was granted by the headright system to heads of families (Harris, 1953, pp. 194-236). Under this system land was allotted in stated quantities on the basis of the number of people who would settle on it. Surveying and recording processes were slow and cumbersome, and the impatient settler frequently became a squatter due to the slowness of the settlement agency. To obtain a grant, grantees had theoretically to meet certain standards, though abuses were possible. An example of the British procedure for a headright grant is appended (Appendix II, p. 185).

Spain declared war on Britain during the American Revolution, and eventually regained control of the Floridas. She offered the lands, previously settled by British and Americans, to the settlers in return for a pledge of allegiance to the Spanish crown and with the understanding that none but the Roman Catholic faith was to be permitted within the area. Many of the British settlers left their claims (indeed many had never actually taken possession of their land), but a number of Americans agreed to the terms, and these Anglo-Saxons began to move into Spanish Florida in increasing numbers, following the streams or divides. Under Spanish rule, lands were divided irregularly, either by the Spanish government or by the squatters themselves. Land was continuously divided this way until West Florida became a part of the United States and Louisiana in 1811. By that
date a great deal of the land had been settled, but some relatively large areas had neither been claimed nor surveyed.

D. LAND LAWS AND GRANTING PRACTICES.

Of all the systems of dividing land in Louisiana, the irregular system was the most simple. Each settler selected his homesite near a stream, yet far enough away from his nearest neighbor so as not to encroach upon the neighbor's claim (Marschner, 1959, p. 12). This might be accomplished in two ways: a) if the settler was preempting ("squatting"), he would claim the land by virtue of occupancy and improvements made. This occurred until the final United States surveys were made. b) Under Spanish rule, land was particularly easy to obtain. The procedure in this case was similar under British and French rule as well. The settler submitted a request or requête, often called a "ricket" in the Florida Parishes, to the granting authority. That agency issued a survey warrant which usually specified a definite number of arpents (under French or Spanish rule) or acres (British and American rule), but did not specify where the grant was to be located. The holder of the warrant was entitled to select his land in any part of the domain which he believed to be available for settlement without prior survey (Johnson and Barlow, 1954, p. 23). The settler tended to include as much of what he considered good land as possible within his boundaries. The granting agency,
especially in the case of Britain (see Appendix I, p. 180), limited the amount of frontage which could be taken on a stream to provide water frontage for as many settlers as possible. That this was not followed to the letter is evident by the configuration of some claims which are oriented with their long axes parallel to the watercourse. Irregular claims were generally without any particular form, although a few of the surveys specify a shape for the grant with the most commonly specified forms being either square, right-angled parallelogram, or gnomon.

The next step was to have the land surveyed according to the metes and bounds with which the settler had outlined his specific amount of land, or "mete." The surveyor and his deputies were assigned to survey lands for which warrants had been issued and to draw up plats on which the metes and bounds of the grant were marked for the records. Though the survey warrant stipulated a definite number of acres (metes), the words "more or less" often appeared in the warrant. Surveyors, especially in the early days, were sometimes inexperienced, incompetent, or both, and did not always demarcate the correct number of acres. In the initial survey, some surveyors apparently did not use survey instruments, and frequently the property was never surveyed at all. A description was given in terms of natural bounds which were certain to give a sufficient quantity of land so the measurement would not be questioned by the patentee, who
usually got more land than he was originally granted (Harris, 1953, pp. 337-338).

As a result of such practices, claims frequently overlapped and disputes arose in virtually every area in which this type of survey was used.

Conditions ... were so bad that the people in each neighborhood were required to assemble at a designated spot and to march from that point in a body to examine, and if necessary renew the terminal marks of every plantation in that precinct - once every four years. In case of a dispute, two surveyors were to run the line (Harris, 1953, p. 338).

Though this type of problem is not inherent in the system itself, it is nearly always found wherever the irregular survey is used, due to the bounds selected by the settler or the surveyor.

Once surveyed, if the procedure went this far, notice of the prospective granting of a patent conveying title was published as a warning to interested persons so that they might issue a caveat, or formal protest, if the impending claim encroached upon their boundaries. If no valid protest was received within the time required by law, a patent was issued.

Many possibilities for error existed in the irregular system. The most frequent was probably the settler's satisfaction with the survey warrant to such an extent that he considered this proces verbal sufficient title. A second type of error could come through faulty surveying--
especially in surveying tracts much larger than the patent allowed. Further, due to the difficulty in recovering corners, it was often hard to locate one's claim. Finally, many settlers never bothered to perfect their title by picking up the patent papers.

E. THE MODEL.

An irregular or metes-and-bounds survey begins at a point of origin. If this is a relatively permanent, recoverable landmark, the survey may be a useful one, but the warrant is often for so many acres near a person's property, or a given number of miles from a specified place. Probably the most famous point of origin in American irregular surveys is quoted by Sherman: "Beginning at the old crow's nest on the north fork of the Kentucky river . . ." (Sherman, 1925, p. 31). From the point of origin, the line moved to the next presumably identifiable point—a tree, rock, stream, or property line. The distance was measured with a chain, usually divided into perches or rods (one perch = 16.5 feet), and the magnetic bearing of the line was noted. The magnetic declination was usually given on the survey plat and was often stated in the field notes. The survey would progress through the remaining corners to the point of beginning, though frequently the last distance—"to the point of origin"—was calculated rather than measured (see Fig. 15). Due to cumulative error in chaining, there was often a
Aerial view of irregularly surveyed land in southern East Feliciana Parish. The town of Slaughter appears in the upper right corner of the photograph. Photograph courtesy Edgar Tobin Aerial Surveys, San Antonio, Texas.
FIGURE 15

Model of an Irregular Survey
Original survey plat (1848) of an irregularly surveyed township in the central part of East Feliciana Parish. The northeasternmost section of this parish is numbered 59. There was no regularity about the numbering of irregular sections in irregularly surveyed townships. The town of Clinton appears near the center of this plat. Survey plat courtesy Louisiana State Land Office.
East Feliciana Parish road map. Note the configuration of the sections and the "spiderweb" road net which often accompanies the irregular survey. Some previously unclaimed areas in the southeastern corner of this parish were surveyed according to the rectangular system. Louisiana Department of Highways.
considerable closure error. Numbering of such irregular sections in a township is random, with regular sections being numbered from 1 to 36, while the irregular sections are numbered above 36. Section numbers often exceed 100 in such areas (see Fig. 16).

The air photograph (Plate 7) illustrates the irregular field pattern associated with the irregular survey. This may be compared with the East Feliciana Parish road map which shows the irregular section lines (Fig. 17). While individual field size is smaller than the sections, there is still good visual correlation with the photograph. (It should be noted that the southeastern portion of East Feliciana Parish does have some regular sections—e.g., Secs. 1-6, T4S, R3E, St. Helena Meridian.)

Bernard Romans, who surveyed in Florida in the 1760's, gives us one of the few detailed accounts of the cost of surveying in those days. Though he himself never surveyed in West Florida, he considered this to be one of the easier areas.

The grantee was expected to pay the Surveyor General and his deputy two pounds three shillings each per hundred acres to be surveyed. In addition he had to pay for the provisions consumed by the survey crew (including rum) and per diem wages for the crew. Beyond this, the grantee would have to pay for the return of two precepts (warrants), plats, and certificates by the attorney general to that official,
plus governor's and secretary's fees. Romans calculated that the total fees incurred for the surveying and patenting of 1850 acres of land in East Florida would come to about $155.00 at the rate of exchange then current. He noted that fees in British West Florida were 50 per cent higher (Romans, 1775, pp. 194-200).

F. ASSOCIATED SETTLEMENT PATTERN.

The Anglo-Saxon settlers (above, p. 16) who implanted this irregular pattern in the Florida Parishes brought the ideas of dispersed settlement and crazy-quilt field patterns which are evident in Plate 7. The dispersed settlement pattern in the Florida Parishes is accompanied by a spider-web roadnet which radiates from the parish (county) seats and stream crossings (see Fig. 17). Irregular survey and spider-web roadnets do not always coincide, for a very similar road pattern appears in Vernon Parish (among others) in rectangularly surveyed country (Fig. 33, p. 163). Though settled by Upland Anglo-Saxons, the prime reason for the pattern here is the rugged terrain.

Many of the settlements in the irregularly surveyed area were populated by related individuals. Group settlement developed, permitting mutual protection and collective counsel and action. Newton (1967, pp. 44-45) has shown that the settlements of St. Helena Parish, for example, are connected by familial and religious ties, and form dispersed
hamlets. These are usually a cluster of farms associated with and named for a single founding family. Some of these settlements grew into more important centers. The whole network has been held together by the church (Newton, 1967, p. 45).

G. ADVANTAGES AND DISADVANTAGES.

The irregular system of surveying has some major advantages to recommend it to pioneer settlers. The settler was able to select what he considered to be the best lands for agriculture and timber and to exclude undesirable land. Moreover, such a system permitted him to settle and take his land prior to survey. In the rectangularly surveyed territory, prospective settlers (at least the law-abiding ones) were not allowed to settle the lands until surveys were complete.

The major problem with the system lies in the uncertain boundaries associated with it. The granting authorities often had an involved set of requirements to be fulfilled before title could be perfected, but in many cases, the lands which were laid out by the settlers were never surveyed. Thus, claims commonly overlapped, and, in spite of efforts to choose boundary markers which were permanent, corners were often lost. Surveyors were often inexperienced and sometimes dishonest. They surveyed lots of so many acres, more or less, and often allowed the settler more land than the patent called for. Furthermore, plat maps were
often omitted, or at least not recorded. Some areas which were mapped were surveyed so inaccurately that the lots had to be surveyed two or three times to get acceptable results.

The legal problems caused by the irregular survey system were recognized by the colonial fathers. Elias Boudinot, twice elected to the Continental Congress from New Jersey, complained that more money had been spent at law in disputes arising from indiscriminate location in his home state than would be required to purchase all the lands of the State of New Jersey (Marschner, 1960, p. 29).

A further disadvantage in the irregular system is that the poorer lands are left, and may thus not be surveyed at all. The presence of the rectangularly surveyed lands in the Florida Parishes illustrates this. These poorer lands were not settled when the area came under the control of the United States and were thus surveyed into township-and-range divisions as part of the public lands.
NOTES TO CHAPTER II

1Milton B. Newton, Jr., has shown that, for at least a portion of the Florida Parishes, hilltop farms were selected often in preference to the valleys. Milton B. Newton, Jr. The Peasant Farm of St. Helena Parish, Louisiana: A Cultural Geography. Unpublished Ph. D. dissertation, Louisiana State University, 1967.

2The earliest known charter in England is probably one from St. Augustine's, Canterbury, dated from 674 or 675.

3Surveyors have used ropes, from the ancient Egyptian harpedonaptae or rope stretchers, through the writings in the Old Testament, by Alexandrian Greeks and on up into the 20th century (Kiely, 1947, pp. 2-17). See also Note 7, Chapter I, p. 75).

4See Marschner, 1960, for a fuller statement.

5Field-grade officers received 5,000 acres, captains 3,000, and junior-grade officers 2,000 acres. Non-commissioned officers got 200, while privates could have 50 acres. Civilian husbands and wives received 100 acres plus 50 acres for each child or slave.

6British headright grants had officially been long lot divisions three times as long as they were wide. See the appended British ordinance governing land grants in West Florida, p. 180.

7Speculators often held this warrant for a time without locating. Such a grant was called a "float."

8Here the procedure differed from the arpent system which required a continuous line of settlement. (See above, p. 41).

9J. V. Hofman, quoted in Marschner (1960, p. 45), noted that:

After almost 20 years nearly all of the boundaries are located, many be agreement and adjustment. When a line calls for N 20° 30' 15" E- 2400 feet D. B. H., it is rather difficult to locate the exact point. As a
forester D. B. H. means diameter breast height to me but I did not recognize the term in surveying until I found it meant "distance by hollering."

The Spanish government attempted to do this in an indirect fashion by forcing the grantees to have adjacent tracts of land.
CHAPTER III

THE SITIO

A. GENERAL.

Sitios are square or rectangular pieces of land, one league on a side or larger, though a few were surveyed with sides of one-half league. As far as can be determined, no common names for this type of land grant were generally applied in Louisiana, other than square or rectangular grants. French settlers referred to these large grants, which were used for rearing livestock, as vacheries. The term rancho was used much more rarely by Spanish settlers. It is felt that, since the great majority of these square grants was issued by the Spanish authorities, and since a peculiarly Spanish custom prevailed in the granting of such land, that the term sitio, used elsewhere in Hispanic America for grants of this type, should be applied to the Louisiana variety.

Sitios appear west of the Mississippi and are most common in what became the Southwestern and Northwestern land districts, though at least one appears on the Red River, almost exactly split by the present boundary between Grant and Rapides parishes (see Fig. 3 for distribution of sitios within the state of Louisiana). The largest of these units is to
be found in Sabine and DeSoto parishes on or near the Sabine River. Sitios were specified for the Posts of Opelousas and Attakapas (St. Martinville) for larger grants (White, 1839, II, p. 230).

B. EUROPEAN ANTECEDENTS AND TRANSMISSION TO THE NEW WORLD.

The procedure involved in the granting of such large tracts is medieval or older, and was part of a common practice followed in New Spain in giving title to grazing and pueblo lands (Brand, 1969).

Land grants of this type were first established in the New World in the Spanish Kingdom of the Indies. This territory was claimed by right of discovery and conquest and awarded to Spain by the Papal Bull of Alexander VI. Special laws which were issued concerning lands in the Indies at different times and under different circumstances were reunited into one code in 1680. This recopilacion and the royal ordinances and cedulas issued thereafter were the embodiment of Spanish law prevailing in America (Taylor, 1955*, pp. 6-7).¹

The sitio land grant seems to have been most common in Texas and Louisiana. Grants of four square leagues were common in Texas, the largest amounting to 600,000 acres (Sadler, 1969).

C. LAND LAWS AND THE MODEL.
Most Spanish grants in Louisiana had been long, narrow arpent strips, but the larger squares were authorized by the ordinances of don Alexandro O'Reilly in 1770. These stated that no grant in the Posts of Opelousas, Attakapas, and Natchitoches should exceed one league in width and one league in length. When the land granted was not sufficiently long, a grant of a league and a half in width might be conferred. To obtain a half-league grant (42 x 42 arpents), the applicant had to have at least 100 head of tame cattle, some horses and sheep, and two slaves to tend them. For the three-quarter league grant a proportionally larger amount of stock was required. According to the same edict, no grants were ever to be made larger than one square league (84 x 84 arpents), or approximately two and five-eights statute miles on a side (White, 1839, II, p. 229).

The Spanish guidelines for land grants were not always strictly enforced. The size of the tract might be larger or smaller, depending upon the economic activity involved. Grazing activities were looked upon with favor, and were subject to larger grants at times through influence with the Spanish government (Holmes, 1969).

The standard unit in the districts of Natchitoches, Opelousas, and Attakapas for the purpose of stock raising was one square league. In Mexico and Texas, a square league or 25,000,000 square varas was called a sitio, and amounted to 4,428.4 acres. When such a tract was granted for the raising of large stock, such as cattle and horses, it was
FIGURE 18

Model of a Sitio Grant
called a sitio de ganado mayor. In Louisiana, the largest and most numerous sitios are found in the western portion of the state (west of the drainage of the Mississippi) which remained Spanish and was not part of the Louisiana Purchase. These sitios often front on or are traversed by a watercourse.

The lands of the so-called Neutral Territory lying between the Sabine and the drainage of the Mississippi were considered to have trifling value, and large grants were frequent, especially in the northwest. Jose Maria Mora told a board of inquiry in Natchitoches in 1824 that:

The soil of the neutral ground is mostly pine hills, and consequently very poor, and fit for nothing but the raising of stock, except some spots on the margin of water courses, which can be cultivated (American State Papers, Public Lands, Vol. 4, p. 35).

The process of obtaining a title to a sitio was as tedious as perfecting title to the much smaller arpent strips. When Spain controlled the Neutral Territory, or Sabine Strip, the surveying was customarily done with the cordel, a rope made from the waxed fibers of the pita plant (Taylor, 1955, pp. 71-72). Where wooded areas made the use of the cordel difficult, a tract might be surveyed a pasos de caballo, or by the steps of a horse. The distance was later calculated by the length and number of steps. Large square grants were often begun from the center of the grant and measured so many leagues "to each wind," as illustrated by Fig. 18 (Taylor, 1955, p. 17).

To obtain his sitio, the settler had to send the
familiar petition for land to the governor or his delegate, who signed an order for the reconnaissance, survey, and appraisal of the land. Official possession was then given to the applicant. A notary in attendance recorded the order and conveyed the certification to the commissioned officer in charge and to the petitioner. All three signed it. Then the special officer, the witnesses, appraisers, and adjacent landowners went to the tract to perform the vista de ojos, or visual inspection, survey, and demarcation. The grantee was then required officially to take possession of his land by walking about over the tract, digging holes, pulling weeds, and the like. These proceedings were incorporated into a report and signed by the officers, the witnesses, and the patentee. The complete record constituted the simplest form of title (Taylor, 1955, pp. 18-19). In addition, the granting officer often assigned a name to the newly granted tract of land.

The following translation represents the complete title issued to Pierre (Pedro) Dolet of the Parish of Natchitoches, situated on the Bayou of the Adaise (Adais), in the settlement of Bayou Pierre. The grant contained "one league around the compass," centered on Dolet's house. The whole tract formed a square two leagues on a side.

1. Señor Lt. Governor: Pedro Dolet of Bayou Pierre, with due respect, represents that he has made a settlement on one of the margins of the Bayou of the Adaise, built a house, expended labor, and raised herds of horses and cattle; wherefore, he prays that you would grant him, at the place aforesaid, a league around the
compass, taking for centre his aforesaid house, so that all the land he prays for may form a square of two leagues on each front, for himself, his children, and representatives. He prays you would grant him the aforesaid land on the terms by him stated; a favor which he hopes to deserve, &c. Bayou Pierre, 7th December, 1795.

2. Nacogdoches, 27th December, 1795. Whereas, Pedro Dolet has made a settlement on the margin of the Bayou of the Adaise, with his house and herds, let this be referred to the procurado de esta comun, and let him put the petitioner formally in possession of the land prayed for without prejudice to third persons.

DON ERNANDEZ.

3. On this 29th day of December, in compliance with the foregoing decree, I, Jose Cayetano de Zepeda, sindsico procurador del comun Pueblo de Nuestra Senora del Pilar de Nacogdoches, went with the witnesses of my assistance don Jose de la Vega and Vincente del Rio, to the place called Bayou of the Adaise, where the petitioner claims, and has built his house, in order to give to the said d. Pedro Dolet, who is now living on the premises, possession according to the decree; wherefore, being at the designated place on the Bayou of the Adaise, and having inquired whether any of the neighbors would be injured by this grant, and having well ascertained that there was no impediment whatever, and that none of the boundaries of the adjacent proprietors intersected or touched those designated by Pedro Dolet in his foregoing petition, for which reason no injury can result to the nearest neighbors by giving Pedro Dolet possession of the land he claims in his petition, with all the extent and the boundaries therein mentioned; I have visited those boundaries, and the land they surround, with the aforesaid witnesses of my assistance, and the said Pedro Dolet, and, taking the latter by the right hand, I went with him a certain number of paces from north to south, and afterward from east to west; and then, having let his hand go, he went as he pleased on the said land of the Bayou of the Adaise, pulled up grass, made holes in the ground, planted stakes, cut bushes, threw dust into the air and on to the ground, and performed several other things and capers, as evidence of the possession which I had given him in the name of his Majesty, whom God preserve, of the said land, with the extent and boundaries which he has demanded, and in proof of the property which he now holds in it as sole master by right of this act of possession; and, also, as a symbol of the right of property which he forever holds on said land, of one league on each course of the compass, in the manner, place, and with the boundaries expressed in his foregoing petition, with all
uses and privileges thereunto belonging; and afterwards, I have designated the aforesaid tract of land by the name of San Pedro de las Adais, so that it may forever go by that name; and in order that said Pedro Dolet may be forever quieted in the peaceable enjoyment of his said land agreeably to law, and that the evidence of his right may appear, I have signed these presents, with the witnesses of my assistance, at San Pedro de las Adais, the day, month, and year aforesaid.

"JOSÉ CAYETANO DE ZEPEDA.

"José Luis de la Vega.
"Vincente del Rio.

4. Having seen the foregoing proces verbal of possession given to Pedro Dolet, and without opposition, let this original document be recorded, and let the party have such evidence of it as will enable him to prove his right of property. I, Bernardo Fernandez, lieutenant of the cavalry and commandant of the post of Nacogdoches, in the presence of the witnesses of my assistance, did receive and record the said deed in the place of a notary, there being none; and I did not seal it, having no seal of office. In testimony whereof, I have signed these presents the 14th day of January 1796.

BERNARDO FERNANDEZ.

"Assist'g witnesses
José Ma. Guadiana.
Mig. Sanchez.

5. A correct copy from the original, deposited with the public records in my possession. Taken, corrected, and compared for, and at the request of don Pedro Dolet, in the presence of the witnesses of my assistance, who with me signed these presents at Nacogdoches the 30th day of May, 1796.

BERNARD FERNANDEZ.

Attest: Miguel Sanchez.
José Maria Guadiana."

(American State Papers, Public Lands, Vol. 4, p. 51).

Most of these two-hundred-odd sitio grants which were confirmed in the "Rio Hondo Claims" or the former Neutral Territory were for 640 acres and were surveyed as sections in the American rectangular system. Others, especially some
of the larger ones, lay askew of the township and range grid, standing out as examples of a different system of land division. The largest of these is the one originally issued to Jacinto Mora, December 15, 1795. Called "Santa Maria Adelaida de las Ormigas," the tract is situated on the left bank of the Sabine River, about twenty-five miles from the site of the former village of Ormegas (see Fig. 3). This vast tract is commonly known as "Las Ormigas Grant," and is so shown on the United States Geological Surveys maps for that portion of Sabine Parish.

Another large sitio grant was made to Edward Murphy, "of the vicinity of Nacogdoches." The "San Pedro of the Bayou of La Nana" grant was to be located "about seven leagues from the east side of the river Sabine, ... on the road leading from this town [Nacogdoches, Texas] to the Post of Natchitoches." The survey was made from the center of the La Nana Prairie, extending "two leagues toward each cardinal point, so as to form a perfect square of four leagues" on a side (American State Papers, Public Lands, (G. and S.), 1834, Vol. 4, p. 60). Murphy's patent was issued August 4, 1798.²

An excellent example of a one-league sitio is that granted to William Wickoff on January 13, 1798. This square tract is presently outlined on three sides by Acadia Parish roads, and lies almost exactly one mile south of the town of Church Point. As in the case of many of these grants, Wickoff's property was traversed by a bayou. Bayou Wickoff
divides the grant into two almost equal portions. This sitio
is approximately three miles on a side, forming a perfect
square which may be readily identified from the air (Plate
8) and on the parish road map (Fig. 19). Another example is
John Labbé's sitio in St. Martin Parish (Fig. 20), traversed
by Catahoula Coulee. The community known as Isle Labbé is
found within the bounds of this tract.

The original pattern of the sitio area, then, consisted of a square or rectangular unit, usually one league on
a side, but ranging from slightly smaller to many times
larger, especially in the northwest. The sitio might be
oriented to the cardinal directions, but was often canted at
an angle to true north. The ranchstead was to be found in
the middle of the tract. The settlement pattern of the sitio
area is not greatly affected by this type of land division
as are the other three types, but sitios form discrete land
divisions which are still readily discernable on the cadas-
tral map and cause local irregularities. Since they are
relatively few in number and scattered, their effects upon
man's use of the landscape are minor. One visible effect,
however, is the way in which sitios have subsequently been
subdivided. In the case of Wickoff's grant, square sub-
divisions have been made, but with respect to the orientation
of the sitio rather than to the American rectangular sub-
divisions which surround it (Plate 8). Other sitios with
streams crossing them have been divided into long strips,
like the arpent-surveyed areas.
Aerial view of a sitio in Acadia Parish, approximately three miles square. William Wickoff's sitio in northeastern Acadia Parish is divided into two approximately equal parts by Bayou Wickoff. Though this tract has been subdivided, its original boundaries are practically intact, with parish roads running along most of the perimeter (just left of the center, oriented northeast-southwest). Compare this photograph with the parish road map (Figure 19). Photograph courtesy Edgar Tobin Aerial Surveys, San Antonio, Texas.
Portion of northeastern Acadia Parish showing the sitio grant of William Wickoff. Wickoff's Spanish patent to this tract is dated January 13, 1798. Note that parish roads run almost the entire perimeter of this grant. Louisiana Department of Highways.
Sitio grants in St. Martin Parish. John Labbé's grant (left center) forms the nucleus of the community known as Isle Labbé. Note the rectangular and rhomboid sitios adjacent to Labbé's. The triangular form was unusual. The Labbe sitio is split by Cataoula Coulee, shown as "Cahoula Coulee" on the plat. It will be noted that Labbé's claim is overlapped by, or overlaps, four other claims. The United States surveyors surveyed these as claimed and gave them section numbers regardless of the ultimate resolution of the conflicts. Original survey plat (1846) courtesy Louisiana State Land Office.
NOTES TO CHAPTER III

1. The Recopilacion de Leyes de los Reinos de las Indias, Book IV, Title 12, deals with the sale, composition, and distribution of land, lots, and waters, with annotated ordinances and decrees, and gives regulations relative to the land system.

2. Large grants of land were offered in the northwest also for the purpose of encouraging Spanish settlement in the nearly empty lands adjacent to the American population, which was increasing at an alarming rate.

3. These large sitios may be seen in Figure 3 as the large squares in the northwestern part of the state.
CHAPTER IV

THE RECTANGULAR SYSTEM

A. GENERAL.

The rectangular survey is defined as lines implanted under the authority of the United States Secretary of the Treasury or later the United States General Land Office, based on the Ordinance of 1796, and actually surveyed, for the most part, by contract surveyors. The system has variously been termed the General Land Office (GLO) System, the Congressional survey, the National Land System, the rectilinear system, and the township-and-range system, in addition to the rectangular system. The term rectangular system has been selected for use in preference to the other terms since it is descriptive of the rectangular, grid-like appearance which it incises on the surface of the earth. Further, since the General Land Office was responsible for the ultimate survey and approval of the other systems in Louisiana, and since all are subsumed under the General Land Office surveys, it is felt that the term rectangular survey system is less confusing. Original rectangular surveys cover most of the state, excepting the areas bounding navigable streams, the bulk of the Florida Parishes, and a few other
areas (see Fig. 3).

B. EUROPEAN ANTECEDENTS.

As in the case of the other systems, the rectangular system has antecedents which are at least conceptual, if not genetic. Though the rectangular system applied in Louisiana is American in origin, the seeds of this American system have surely diffused from Europe. Systems of land division which have a gridiron appearance are known in the Indus Valley from a remote date, and were also engrained into the irrigated lands of southern Israel prior to the Christian era. The most likely antecedent for the American-developed system, however, is the Roman centuriation. The Roman centuriatio system is well-documented by historians and archeologists. While there is no direct proof that this was the system on which the American rectangular survey was based, descriptions of centuriation were certainly available when the former was developed.

The literature concerning the Roman system is voluminous, dating back to the writings of the Roman agrimensores themselves. One of the best shorter treatments in English is that of Kish, who systematically covers the procedural aspects of the survey (Kish, 1962, pp. 233-244). Fernando Castagnoli’s book contains the most comprehensive modern survey of literature on the topic (Castagnoli, 1958), while Bradford devoted a long chapter to the archeological aspects of the system and the use of air photography in
identifying such sites. Bradford also dealt with the procedure of implantation of the Roman grid into the landscape (Bradford, 1958, pp. 145-216). The *Atlas des Centuriations romaines de Tunisie* (Institut Géographique National, 1954) has been described as a monumental study of the system in one part of North Africa, consisting of some forty-three maps at 1:50,000 based on 15,000 air photographs.

It is generally accepted that the Romans began complete land surveys and assignment of individual parcels of land after the fall of Carthage (140 B.C.) (Kish, 1958, p. 233). The system was used for settling a farming population and was used mostly in newly conquered country, but was never intended to provide the general setting for farming in Roman lands. It was a specialized measure appropriate to particular Acts of State (Bradford, 1958, pp. 145-146). Lands surveyed in this Roman fashion are found in large areas north and south of the Mediterranean, especially in the central portion of Italy, Istria, southern France, and Tunisia. The system is also reported from Great Britain. While the grid pattern is the same, a variation of the mesh is often noted, depending upon the quality of the land, the region, the type of recipient, and other factors. By the time of the Empire (i.e., after 27 B.C.), the regular choice was for *centuria* of 20 by 20 *actus*, but in the earlier days of the Republic, squares of 12 by 12 and 5 by 5 *actus* were marked off as well (Bradford, 1958, p. 146).

The origins of the survey are obscure, but the
Model of Roman centuriation. The survey begins at the umbilicus (center) and proceeds left and right along the decumanus maximus (base line) and up and down along the cardo (principal meridian). Every fifth cardo and decumanus (each fifth line is called a quintarius) outlines a saltus. 25 centuriae make up a saltus. See Figure 22 for a map of a centuriated area of the Po Valley.
rectangular grid seems to have made its way into Rome from Greece, where it was in continuous and common usage in the 6th century B.C. Stanislawski indicates the transmission of the idea into Etruria at an early date, so that by the end of the 6th century B.C. the Etruscan city of Marzibotto exhibited the grid pattern. "Here the cardo and decumanus of later Roman cities clearly appear" (Stanislawski, 1946, p. 116). The Romans adjusted the Greek plan to their own needs, presumably filtered through Etruscan usages (see Fig. 21).

Officially, Romulus, founder of Rome, was supposed to have distributed two iugera (jugera) to each man (Table I). These two units formed a heredium, or homestead. One hundred lots of two-iugera units formed a centuria, the basic unit of the Roman field surveys. (The actual basic unit was the actus, one hundred feet square, but it was seldom used.) In practical usage, the basic unit was the iugerum, 240 x 240 feet. The Roman homestead thus amounted to 1.32 acres (Kish, 1962, p. 234).

The most important unit of the field survey, which determined the layout of the fields, roads, and most of the other works of man, was the centuria, composed of one hundred heredia. It measured 2,400 feet on a side and consisted of 132 acres, only about one-fifth of an American 640-acre section. Twenty-five centuriae made up a saltus (Kish, p. 234).
<table>
<thead>
<tr>
<th>Unit</th>
<th>Area</th>
<th>Equivalent Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>actus</td>
<td>14,400 sq. ft.</td>
<td>(base)</td>
</tr>
<tr>
<td>iugurum</td>
<td>28,800 sq. ft.</td>
<td>2 acti</td>
</tr>
<tr>
<td>heredium</td>
<td>57,600 sq. ft. (1.32 acres)</td>
<td>2 iugera</td>
</tr>
<tr>
<td>centuria</td>
<td>132 acres</td>
<td>100 heredia</td>
</tr>
<tr>
<td>saltus</td>
<td>3,300 acres</td>
<td>25 centuriae</td>
</tr>
</tbody>
</table>

As in the case of the Ordinance of 1785 in the United States, the Romans of the late Republican period also made provisions concerning the disposal of newly acquired lands (in this case, the territory of Carthage, 111 B.C.) (Kish, 1962, p. 234). Roman laws survive which deal with the maintenance of boundaries and the location, shape, and size of their markers (Kish, 1962, p. 234).²

Roman centuriation began with the selection of the central point, or umbilicus where the principal coordinates intersected (see Fig. 21). This was preferably in the central part of the principal settlement, and these coordinates would become the major streets (see Fig. 22). Parma, on the southern edge of the Po Valley, is probably the best extant example illustrating the principle (Kish, 1962, p. 234). The first lines laid out were the base line or decumanus and the cardo, or principal meridian. Tradition recommended orienting
Roman centuriation near Lugo, Italy, in the Po Valley. The figure is oriented north-south, so the decumanus (base line) runs northwest-southeast. The decumanus and cardo form the two principal thoroughfares of Lugo. Compare this reticulated Italian landscape and the grid-plan city in Figure 29 and Plate 12 which show a similar pattern in Jefferson Davis Parish and the countryside and street pattern of Rayne in Acadia Parish (Instituto Geografico Militare. Atlante dei tipi Geografici, Tav. 66, Foglio di Imola, 1948, scale 1:25,000)
the *decumanus maximus* to coincide with the east-west passage of the sun and the *cardo maximus* to run north-south, but the pragmatic Romans often tempered theory with realistic modifications to cope with problems of terrain, preexisting roads, and the like (Bradford, pp. 150-151). In actual practice the base line (*decumanus maximus*) followed the shape of the survey area, and was almost always its longer axis (Kish, 1962, p. 235). In theory, a survey could be oriented toward any one of the cardinal points, but Roman surveyors considered a south-oriented base line unreasonable. Wherever possible the *decumanus maximus* was made to coincide with extant consular, or trunk roads.

Another similarity between the *centuriatio* and the American rectangular system is the associated road net. Roman law prescribed the width of roads which were basic to the survey. The *decumanus maximus* and *cardo maximus* were forty feet wide. Every fifth line (*quintarius* or *actuarius*) was twelve feet in width, while the roads in the intervals between (*subruncivi* or *linearii*) were to be eight feet wide. Roads parallel to the *decumanus* were *limites prorsi*, and those parallel to the *cardo* were termed *limites transversi* (Kish, 1962, pp. 235-236). By law, the roads which coincided with the principal meridian (*cardo*) and the base line (*decumanus*) and the *quintarii* were to be public. The other, minor roads such as the narrow *rigores* within a *centuria* needed only be available to adjacent landholders (Kish, 1962, p. 236).

Roman survey lines were numbered in a fashion similar
to that adopted by the American system. Each of the lines running parallel to the base line had a designated consecutive number right or left of that line. In like manner each line running parallel to the principal meridian was consecutively numbered according as it was left or right of that line. Centuria corners had to be clearly marked with a cross indicating the directions of the intersecting lines. Surviving examples of corner posts are further designated by the numbers of the lines and the name of the agency which surveyed them (Kish, 1962, p. 238).

Direct parallels may be seen between the ancient Roman system and the modern American one. In both cases, examples may be cited where street, road, and field patterns repeat the cadastral pattern. While the reasons for the correspondence are essentially the same, the dimensions differ. A major difference between the systems lies in the fact that the American base lines were designed to be true parallels and meridians, capable of indefinite extension, while the Roman decumanus and cardo were ad hoc lines designed for settlements of fixed size and were surveyed only in arable lands (Kish, 1962, p. 238). Moreover, the principal lines of the Roman survey did not have to be oriented in any particular direction (p. 117 above), but orientation to true compass direction is a cardinal requirement in the American rectangular system (see Fig. 23).

Roman surveyors were variously termed finitores, agrimensores, or gromatici, the last name derived from their
FIGURE 23

Model of Rectangular Survey as it was Implanted in Louisiana. The smallest parcel designated is Section 34, T2N, R2E.
surveying instrument, the *groma*. Kish (1962, pp. 241-242) gives a full description and sketch of the instrument. Similar to the duties of the contract surveyors in Louisiana, the Roman *gromatici* had to file plats (*forma*) and field notes (*commentarii*). One copy went to the local archives and another went to the central archives (*tabularium*) in Rome (Kish, 1962, p. 240).

Pattison concluded that a different European system might have been the immediate antecedent of the rectangular system of the United States. Hugh Williamson, to whom credit is given for suggesting the rectangular plan to the Congressional committee of 1784, may have been the agent of transmission of the rectilinear system from Europe. Williamson studied medicine at Utrecht, the Netherlands, and was also noted for his prowess in mathematics and astronomy. Pattison, following Sherman, believes that Williamson was probably familiar with the Polder Beemster, west of the city of Edam (Pattison, 1957, p. 62). "This tract of reclaimed land, bounded on the south by the Noord Hollandsch Kanal, is shown on modern topographic maps as an area divided by roads into perfect squares, each measuring approximately one nautical mile on a side" (Pattison, 1957, p. 62). Within each of these large squares, the subdivisions (rarely square) are regularly bounded by canals. The canals show a distinct tendency to a spacing of 0.10 miles. This polder was reclaimed and parcelled by the engineer Leeghwater in the first half of the 17th century (Sherman, 1925, p. 221).
C. THE AMERICAN RECTANGULAR SYSTEM IN LOUISIANA.

Prior to its admission to the United States, Louisiana had been governed by France, England, and Spain, whose government had stipulated the ways in which land was to be granted to private individuals—either in arpent strips, in irregular polygons, or in large square or rectangular tracts. In addition, unauthorized squatters preempted land in irregular parcels. While these types of land divisions were scattered over various parts of what is now Louisiana, the bulk of the area was devoid of any cadastral patterns of European or of United States origin. When the United States assumed possession of the province of Louisiana on December 30, 1803, it was faced with two immediate problems: the investigation of the private claims, or grants which had been issued and completed to various stages of the process of obtaining a patent; and the survey and sale of the vacant public lands.

On March 2, 1805, Congress passed an Act for Ascertaining and Adjusting Land Titles and Claims to Land, Within the Territory of Orleans, and the District of Louisiana (Statutes at Large, II, p. 324). The Territory of Orleans formed the nucleus of the present state of Louisiana. Sections of this Act extended the United States rectangular system to Louisiana. The Surveyor of Public Lands South of the State of Tennessee was directed to introduce rectangular survey, and to "cause such of the lands as the President of
the United States shall expressly direct to be surveyed and
divided, as nearly as the nature of the country shall admit”
(Statutes at Large, II, p. 324). In order to do this, the
Eastern and Western Districts (Fig. 24) were created, sepa­
rated by the Atchafalaya River (A. Gallatin to I. Briggs,

The first Surveyor of Public Lands South of the State
of Tennessee was Isaac Briggs. Among his first tasks were
the surveys or resurveys of private claims, and he was
authorized to appoint whatever assistants he required.
Claims for which titles were completed prior to October 1,
1800, were to be surveyed at government expense. For claims
after that date, a fee of four dollars per mile was to be
charged, unless surveyors could not be procured for that
amount (Downs, 1960, p. 20).

Further, the Surveyor of Public Lands South of the
State of Tennessee was to lay out 160-acre tracts in the
alluvial country (American long lots), and to survey several
ranges of townships using the rectangular system in
Louisiana west of the Atchafalaya and east of the meridian
of Natchitoches (ca. 93° West Longitude) (Secretary of the
Treasury to I. Briggs, May 28 and July 2, 1805). Surveys
were not to be extended farther west than Natchitoches so
that the Spanish in the Neutral Strip between Louisiana and
Spanish Texas might not be provoked.

The ranges of townships to be laid out were to com­
mence at some distance from the Mississippi, but they were
LAND DISTRICTS
1805 - 1811

Source: Records of the Louisiana State Land Office
to be connected with an east-west line and with some known point on the Mississippi. The Secretary suggested the 31st degree of latitude as the most desirable line.

Briggs himself took part in the initial phases of the surveys. In January of 1806, he and his field party (three surveyors and ten laborers) ascended the Mississippi to its approximate intersection with the 33rd parallel to meander certain rivers, to locate certain lands to be granted by Congress to General Lafayette, and: "... by observations, and explorations, to prepare and perfect a comprehensive plan for the general survey of the public lands of the territory" (Report of the Surveyor General of Louisiana for 1873). During the same period, Briggs' deputies had been ordered to organize field parties and commence the survey of the Orleans Territory. Little was accomplished due to the opposition of the natives, who felt that the Spanish would shortly regain control of the territory and might take offense at the American resurvey (Downs, p. 29). Surveyors were threatened and some resigned, but the confidence of the local inhabitants was eventually won.

In spite of this gradual success, the survey markers were often destroyed in private tracts and in vacant public lands. They were removed by individuals who feared for their claims, or by stockmen who claimed that the markers interfered with their cattle drives. The latter were actually more concerned about the possible reduction of open range. The stock themselves broke off, or worked the posts
out of the ground by rubbing against them. They also made wallows of depressions dug for the purpose of marking corners. Lastly, the annual firing of the prairies destroyed many of the wooden stakes (Downs, 1960, pp. 27-32).

Congress, in attempting to expedite the survey of the state, authorized Briggs to appoint a principal deputy to be in charge of each of the two land districts (above, p. 124). (Statutes at Large, 9th Cong., 2d Sess., pp. 391-395). Walker Gilbert was appointed to the Eastern District, while Gideon Fitz was made Principal Deputy Surveyor of the Western District (see Fig. 24). The Surveyor of Public Lands delegated his authority to these deputies, but the deputies were to be regulated and instructed by the Surveyor. In addition, the Surveyor commissioned deputies who were to operate under the two principal deputies.

After the Act of 1811 was passed, and Thomas Freeman succeeded Briggs as Surveyor of Public Lands South of the State of Tennessee, a third land district was created, called the District North of Red River. Created out of the vast Western District, it consisted of all lands between the Red River and the 33rd parallel (see Fig. 25). Freeman supervised the deputy surveyors in the new district, for he felt that there were too few private claims to warrant the expense of another Principal Deputy Surveyor. Figure 26 illustrates the present Federal Land Districts.

Thus, by 1812, the rectangular surveys of lands in Louisiana had been begun in earnest. The Western District
was further divided into the Northwestern and Southwestern districts, which comprise the current Federal Land Districts. It would not be before about 1820, however, that rectangular surveys (township and range lines, if not sections) would really be extended into all parts of the present area of Louisiana. The surveyors had repeated difficulties in surveying the private claims in the St. Helena or Greensburg District.

By 1820, nearly 2,000,000 acres of the more than 29,000,000 acres of the state had been surveyed. By then it was known that the District West of Pearl River and East of the Island of Orleans (Greensburg District) contained about 130 townships, which consisted mostly of irregularly surveyed claims (see Fig. 25). The area of the Southeastern District, about 150 townships, was considered wholly alluvial, with the cultivable lands confined to the margins of watercourses and lakes. Surveyor Freeman believed that the whole district could never be subdivided for sale, since it was "thickly interspersed with lakes, swamps, morasses, salt marshes, etc., which appear to occupy more than two-thirds of the whole district." The Southwestern District was thought to contain about 400 townships. About half of these had been surveyed, but of that figure, some 50 were interspersed with private claims (arpent and sitio surveys) which had not been surveyed. The District North of Red River consisted of about 390 townships, of which about 100 were low alluvial lands of the Mississippi. The survey of
the uplands had been essentially completed (Thomas Freeman to Josiah Meigs, Commissioner of the General Land Office, October 10, 1820. Surveyor General's Letters, August 31, 1805 - April 15, 1831).

It would not be until February 6, 1861, however, that federal surveys would be completed in Louisiana (House Executive Documents, 37th Cong., 3d Sess., No. 1, p. 40). But the office of the United States Surveyor General of Louisiana was not abolished until 1910, when its maps and field notes were transferred to the State Land Office in Baton Rouge. The U. S. Land Office in Baton Rouge remained open until 1927.

Surveys of the entire state have never actually been completed. Though lines have been extended from the last lines actually surveyed, fairly large tracts of land in the coastal marshes, as well as some portions of the Atchafalaya Basin have yet to be surveyed (see Fig. 3). Due to active oil interests, portions of these areas are currently being surveyed for the first time.

During the period when active surveys were taking place (1805-1861) in the public lands of Louisiana, the costs of the surveys were important. Due to the conditions under which surveyors had to work in much of the territory, and to the prevailing low prices paid for such services, it was difficult to find competent men.

As indicated above (p. 125), the earliest rates mentioned for surveying were to be $4.00 per mile, unless no one
could be procured for that sum. But on December 31, 1805, Isaac Briggs wrote to the Secretary of the Treasury that:

... it appears to me impossible that the survey of the United States' lands in this quarter can be effected by an honest man, who valued his own reputation and the good of his country, unless Congress will consent to allow compensation to deputies which may in certain cases be extended to at least $8.00 per mile (Records of the General Land Office, Letter Received from the Surveyor General, LII, quoted in Coles, 1949, p. 17n).

By 1812, Congress had at least authorized variable fees, rather than the former flat rate of $4.00 per mile. In the uplands, the average fee could be three to four dollars per mile, and up to five dollars per mile in the low, inundated areas, but the average cost of survey was not to exceed $4.00 per mile (Freeman to Fitz, December 6, 1812).?

During the time of active surveys of Louisiana, it was the custom for the Surveyor General to contract out the surveying work to private individuals. The individual surveyor was usually in considerable financial difficulty. He was expected to hire and pay his own survey party, which usually consisted of two chainmen, a flagman, an axeman, and two moundmen (Donaldson, 1884, p. 182). Most of these would not work for less than twenty-five to thirty dollars per month, plus food and lodging. Furthermore, the surveyor was expected to hire the boats in the wet areas and the carts for hauling corner posts in the prairies. Often, when their own fees were delayed, they were forced to borrow money at high rates of interest (ten per cent or more) to pay their
Complaining about the poor quality of the early surveys, Freeman in 1811 noted that anyone who could procure a compass and present himself as an applicant for business could be commissioned a surveyor (quoted in Downs, 1960, p. 56). 8

D. THE MODEL.

Theoretically, the rectangular system gives rise to a landscape characterized by an orderly network of north-south range lines which are intersected at right angles at six-mile intervals by east-west township lines (see Fig. 23). The finished product, however, usually varies from the theoretical ideal.

1. INSTRUCTIONS AND INSTRUMENTS.

In the early days of the rectangular surveys in the United States in general and Louisiana in particular, there was no uniform body of instructions for surveying public lands except for the various acts passed by Congress relative to public lands and occasional circulars from the General Land Office. By 1855, the General Land Office had evolved a compilation of the various Acts of Congress which were passed relative to the survey of the Public Lands, and various refinements and changes which had evolved from practice. These various modifications were made known to the surveyors by occasional circulars from the General Land
Office and from the Surveyors General of the several states and territories. The publication of this compilation of legal acts, instructions and experiences in 1855 as the first *Manual of Surveying Instructions for the Survey of the Public Lands of the United States* (General Land Office and Bureau of Land Management, 1855, 1890, 1894, 1902, 1930, and 1947) was the first guidebook of its kind, and it became informally known as "the Bible" to surveyors of the public lands. An act of May 30, 1862, provided that the *Manual* be "a part of every contract for surveying the public lands of the United States" (Stewart, 1935, p. 14).

The surveys of Louisiana were very nearly completed by the time the *Manual* was officially recognized by Congress, and as such that compilation played its role very late in the chronicle of the surveys of Louisiana. In its stead, a series of letters and circulars was issued from the General Land Office (GLO) in Washington to the Surveyors General. Prior to 1831, there were few formalized instructions of any kind available to the deputy surveyors in the field. After that date, more information came down to the Surveyors General in the form of GLO circulars. These were for guidance and direction in the discharge of official duties; the requirements of the Department in reference to the township surveys and the mode of making returns thereof, in order that the Surveyors General might instruct their deputies and adapt the contracts and form of field books to suit the requirements of the GLO.
By 1830, formal instructions (circulars) concerning the performance of rectangular surveys had been issued to the contract surveyors (known as deputy surveyors), and by the following year, rather detailed instructions were available in the form of a circular issued by the General Land Office in Washington. This latter circular contained some 22 paragraphs germane to the surveying of public lands of the United States.9

The first 14 paragraphs deal with the preparation of the township plats, the manner of showing distances and direction, and the method of representing the prairies and swamps. The place names were to be recorded as they were given (i.e., the surveyor was not to assign names where other names were already in use). Lakes and ponds were to be meandered, showing the courses and distance wherever they were of sufficient extent. Navigable streams were declared to be public highways, unless otherwise specified, and were not to interrupt the regular survey of township lines.

Further instructions include extracts from the various acts which provide:

... that the public lands shall be divided by North and South lines, run according to the true meridian and by others crossing them at right angles so as to form Townships of six miles square (General Instructions, 1831, par. 16).

The initial act (May 18, 1796) provided that only every second section line be actually protracted in the field and that each section corner be marked. Subsequent
amendments provided for the running of each section line. The subdivision of sections into halves and quarters was provided by the act of February 11, 1805.

The lands are to be laid off in townships of precisely six miles square by lines running due North and South and East and West. On each of those lines precisely at the distance of one mile apart, corners are to be established for sectional lines. Parallel lines are to be run through the township each way, from each sectional corner to the corresponding sectional corner, on the opposite side of the township on each of which lines sectional corners are to be established at the distance of one mile apart, which process will divide the township into thirty-six sections. In running the exterior township lines and also the interior sectional lines, intermediate, half mile, posts or corners (precisely equidistant between the corners of the sections) are to be established as the boundaries of quarter sections (General Instructions, 1831, par. 16).10

The instructions further provide that, when surveying errors might take place within a given township, the excess or deficiency should be deducted from or added to the northern and western ranges of sections or half sections. These larger or smaller sections were to be expressed in the returns and plats and sold as such. All others were to contain the legal area.

The townships were thus to be divided into sections containing as nearly as possible 640 acres each, and were to be numbered respectively, beginning with the number one in the northeast section and proceeding west and east alternately through the township with progressive numbers, until the thirty-six be completed (Fig. 23).

In the frequent event (in Louisiana) that a township
contained prior private claims of the irregular type or the more common arpent strips or American long lots, the section numbers in that township generally exceeded thirty-six, and were often in excess of one hundred. There was no general rule about the numbering of the irregular sections in such a township.  

Each Deputy Surveyor was to provide himself with two two-pole chains (each 33 feet long) and subdivided into 50 links which were to be regulated by the Standard Chain in the Surveyor's office. One of the two chains was to be retained as a standard, and the other was to be used in the field. The deputy was to compare the standard chain with the one actively used at least every other day, if not more often. Each surveyor was also to have a good compass with a nonius, or a theodolite, which had advantages when taking long sights. These instruments were also to be compared against the standards kept in the surveyor's office for that purpose. During the early days, surveyors sometimes referred to a "compass of Rittenhouse construction." David Rittenhouse is thought to have been the first American to attach a vernier (or nonius) to a surveying compass sometimes in the late 18th century (Plates 9 and 10). The nonius allowed the surveyor to correct for magnetic declination, and it was occasionally used to read the direction of the needle to a greater degree of accuracy than was obtainable from the fixed gradations on the graduated ring around the edge of the compass rose. While the theodolite was an accepted
Rittenhouse and Evans compass similar to those used in Louisiana near the turn of the 19th century. At the left is the nonius, or vernier, which enabled the surveyor to adjust for the magnetic declination or to allow him to read the instrument to a finer degree of accuracy. A leveling bubble (broken) appears at the right. A "compass of Rittenhouse construction" was considered to be one of the finest instruments available at the time of the early Louisiana surveys. Photograph courtesy Smithsonian Institution.
An early surveyor's compass made by Gurley. The nonius, or vernier, is on the right of this example which contained two leveling bubbles (left). The sights appear at either end of the compass. Photograph courtesy Smithsonian Institution.
instrument, the compass was in much more common use in Louisiana.

The chain was a wire device 33 feet long, consisting of 50 links, each 7.92 inches (Plate 11). At the end of each chain measured, a steel chaining pin would be planted in the ground, and duly tallied on the loop carried for that purpose.

Since the surveys were required to be "according to the true meridian, and at right angles therewith," the variation of the magnetic meridian was to be observed and ascertained from time to time, and always to be indicated on the township plat.

The chain was to be held as level as possible at all times when chaining irregular or hilly lands, in order to obtain the true horizontal distance. The chaining pins were also to be plumbed for the same reason. It was considered important enough to make these stipulations part of the oath administered to the chainmen.

2. MARKING.

Corners were of great importance, and they were to be marked by blazing, chopping, or with burning irons. Bearing trees were to be used wherever possible. Otherwise, posts "made of the most durable wood that can be had" were to be used. The latter were to be "set in the earth to the depth of two feet and very securely rammed in with earth and stone" (Instructions, 1831, par. 20). Posts were to be uniform for a particular kind of boundary, and there were to be "striking
Surveying equipment used by early contract surveyors in Louisiana. At the top and left is the surveyor's two-pole chain (33 feet long) subdivided into 50 links. Chaining pins (right) were used for temporary markers. At the center is a tally, a leather thong with leather washers for tallying the number of chains measured along a given line. Photograph courtesy Smithsonian Institution.
differences" between posts used for different purposes. In the prairie where bearing trees were not always available, sod-covered mounds were to be constructed, and a small amount of charcoal was to be enclosed, and a stake was to be planted in the center of the mound. The instructions stressed the great importance of the perpetuation of corners of the public surveys.

Every possible care and precaution to secure correct and durable corners must be observed by your Agents whose fidelity you should test by every means in your power (Instructions, 1831, par. 20).

3. FIELD BOOKS.

To the geographer, field books are of rather marginal interest as far as the recording of the number of miles, chains, and links run by the surveyor, but his description of the terrain may often be useful. The law required that:

... every surveyor shall note in his field book the true situation of all mines, Salt licks, Salt springs, and mill seats which shall come to his knowledge, all water courses over which the line he runs shall pass, also the quality of the lands (Instructions, 1831, par. 21).

In Louisiana, surveyors were often required to give information on vegetation as well. The United States Navy was interested in timber for ship-building.

E. THE SURVEYS.

The surveys began with the establishment of a "basis parallel" or base line, which was to be 31° North Latitude.
This line represented a continuation of the line known as Ellicott's Line, originally surveyed in 1798 to mark the boundary between the United States and Spanish Florida. Isaac Briggs wished accurately to tie the lands between the Atchafalaya and the Mississippi by extending this 31st parallel. However, in order to prevent the provocation of the Spanish in Texas, in no case was the "line of demarcation" to be extended west of the Meridian of Natchitoches. The survey of the Base Line ("basis line") was entrusted to John Cook, a deputy surveyor of the Western District. He began near the end of 1806, and surveyed some 84 miles of his contract, to a point some 36 miles west of the Principal Meridian ("basis meridian"). Cook supposed the stream at this point to be the Sabine, but it was probably a tributary of the Calcasieu. In the meantime, Briggs had surveyed the 33rd parallel from the Mississippi to the Red River, a distance of about 156 miles. Thomas Owings, under the direction of Gideon Fitz, extended a meridian northward to the 33rd parallel, and southward toward the Gulf, beginning at a point 48 miles west of Ellicott's point (Darby, 1818, p. 7). Secretary of the Treasury Gallatin had considered two possible points where the "basis meridian" might intersect the "basis line"—the Rapids of the Red River, or the Meridian of Natchitoches. The main idea was to locate the meridian far enough west to avoid inundation by the Mississippi. Eventually the line was established eight ranges (48 miles) west of the Mississippi, and came to be known as the Louisiana
Meridian. This line is situated 92° 20' west of Greenwich and governs all surveys of Louisiana lands west of the Mississippi (Figure 27).

Due to unstable political conditions in the territory, the United States wanted to settle Americans as soon as possible in the new lands. Accordingly, Secretary Gallatin issued the following instructions to Briggs:

... you will perceive that it is the wish of the Legislature that the public lands should be offered for sale in that quarter; and I will add, that that object is considered as intimately connected with the welfare and even the safety of that newly acquired territory. --For it is the only portion where any great increase of American population can take place, and I need not comment on the importance of that object. --It may indeed in this instance be found necessary to sacrifice the scientific correctness which might otherwise be desirable, to the dispatch which is indispensably necessary (The Secretary of the Treasury to Briggs).

From the initial point established at the junction of the basis meridian and the basis line, some 18 surveyors commenced to lay off townships east and west of the meridian, and north and south of "Cook's line." By 1807, they had surveyed over 100 townships east of the meridian and 5 ranges west of it, and some of the latter townships had been sections (Report of the Surveyor General of Louisiana, 1873).

The surveyors had returned the field notes and had been paid, when it was discovered that not only had scientific correctness, but even the most ordinary rules of compass surveying had been sacrificed in order to accomplish a field survey so defective that an accurate representation of the
FIGURE 8

BASELINE and PRINCIPAL MERIDIANs

SCALE

0 50
Miles

Arkansas

MISSISSIPPI

Texas

Gulf of Mexico

Natchitoches

St. Helena Meridian

Baton Rouge
country on township maps was delayed for many years. It was necessary to resurvey the base line before township maps could be protracted with any degree of accuracy. The corrected line began at the initial point and was extended eastward to the Mississippi, terminating 47 miles and several chains from the initial point, and over 1,200 yards north of Cook's line. West of the initial point, Cook's line was found to be a zigzag line which gained over 600 yards north of the corrected 36 mile line (Report of the Surveyor General of Louisiana for 1873). It is obvious today that the 31st parallel and the base line do not coincide, and the zigzag line westward from the Mississippi is readily discernable on the official state map.17

Owings' basis meridian was also defective. Sixty-six miles were resurveyed and found to be some 50 chains in excess of the correct distance, but at no great variance from the true meridian. These defects in the original surveys of the base line and principal meridian continued to affect the surveys in the Western District and the districts which were to subsequently be made from it (see above, p. 123). The discrepancies in these basis lines were evident from an early date, but since considerable money had been spent in effecting them and since extensive surveying had already been based on these lines, the former, erroneous lines were re-established wherever practicable in order to bring these lands into the market (Report of the Surveyor General of Louisiana for 1873).
The establishment of the St. Helena Meridian and the eastward extension of Ellicott's Line (31° North) were also erroneous. In May, 1819, Thomas Freeman appointed Silas Dinsmoor (or Dinsmore) as Principal Deputy Surveyor of the Greensburg Land District. Dinsmoor then contracted surveyors for the purpose of surveying and marking township, range, and section lines. The contracts specified the townships which were to be surveyed, and the manner in which they were to be surveyed (Elliott, 1961, pp. 38-39). The first surveys were south, east, and west of a point known as Ellicott's 24th Mound (31° North Latitude, 24 miles east of the Mississippi). The base meridian on which all future surveys would depend was an extension of the Washington Meridian which governs surveys in the present state of Mississippi. The Washington Meridian was established in 1806 by George Davis and Gideon Fitz (Walsh and Crawford, 1945, p. 1). The base line used in the Greensburg District was the eastern part of the "line of demarcation" (see above, p. 142). This 31st parallel was surveyed by Andrew Ellicott in 1798 as the southern boundary of the United States. Ellicott made an error in establishing the line which was to lead to numerous subsequent errors in the surveys of the Greensburg District. His error resulted from the use of a compass rather than a transit in surveying the 31st parallel from a point 21 miles east of the Mississippi, eastward to the Pearl River. When he reached the Pearl, Ellicott checked his position by celestial observation and found that compass error had placed
his line 12.25 poles (202.125 feet) north of where it should have been. He had marked the erroneous line with mounds at one-mile intervals. In order to adjust the error, Ellicott distributed the error throughout each mile of the line, back to the point 21 miles east of the Mississippi. Unfortunately, he neglected to destroy the original incorrect mounds, and subsequent surveyors, who used the first mounds, incorrectly located all township and section corners in that range (Thomas Black to Francis D. Newcomb, July 31, 1844). Scrutiny of that eastern segment of the Base Line, which forms the boundary between Louisiana and Mississippi, reveals Ellicott's errors. The Base Line commences south of the actual position of the 31st parallel on the left bank of the Mississippi and very gradually moves northward along its eastern course to St. Helena Parish, where the two lines coincide for a distance. As the Base Line was extended westward from St. Helena Parish, it gradually shifted northward. By the time the 31st parallel enters western Mississippi, the Base Line has moved well to the north of it.

F. DISCREPANCIES IN THE RECTANGULAR SURVEYS.

The American rectangular survey system is the most nearly perfect approach to cadastral surveying because of the precise way in which one and only one plot of land is described by the following: NW 1/4, NE 1/2, Sec. 31, T10S, R2E, Louisiana Meridian. However, this system is not without errors. No provision had been made for the convergence
of meridians (Hayne, 1968, Hadden, 1969), but greater discrepancies came about as a result of instrument and human error. The early compasses with which the surveys were run were not the most accurate. Lines run with the magnetic compass were sometimes off by a degree or more (Hayne, 1968). The greatest errors, however, were those perpetrated by the surveyors. That they did not always tie their respective townships is obvious from a glance at the cadastral map of the state. Examples of failures to tie townships are quite common. Figure 28 illustrates an example between Ranges 7 and 8 West, Louisiana Meridian, from southern Beauregard Parish northward to the Base Line in southern Vernon Parish. In some sections lines fail to tie by almost half a mile. A similar discrepancy can be seen between Ranges 6 and 7 West from the Base Line in Vernon Parish northward into Natchitoches Parish. As indicated above (p. 145), the Base Line itself is not surveyed as a true parallel, but is seen to zigzag as it runs through Rapides and Vernon parishes.

The surveys not only failed to tie in all cases, they failed to meet in several instances, leaving some rather large unsurveyed strips in St. Landry and Concordia parishes. In St. Landry and Avoyelles parishes there is a gap between Ranges 4 and 5 East, which runs through Townships 2, 3, and 4 South, a distance of 18 miles. Another conspicuous gap exists between Ranges 9 and 10 East, and between Townships 4 and 5 North, an error which runs for a total of 23 miles.
Failure of townships to tie. This is a portion of the parish highway map of southern Beauregard Parish. Since there was no requirement that townships surveyed by different contractors had to tie, there was often a wide discrepancy between township and section corners in adjacent townships. This error, which runs down the center of the map, exists between Ranges 7 and 8 West, Louisiana Meridian, from Calcasieu Parish northward through Vernon Parish. Louisiana Department of Highways.
in Concordia Parish (see Fig. 29).

"Waves" in section lines are common, as exemplified by the western portion of Lafayette Parish between Ranges 2 and 3 East, Louisiana Meridian.

Without visible reference points, surveyors in the coastal marshes frequently became lost while surveying. Their frustration is exemplified by the cartoon Deputy Surveyor Thomas Bilbo drew in his field notes for December 8, 1838 (Fig. 30) (Bilbo, 1838, p. 72). Bilbo began a series of surveys in the coastal marshes of the Southwestern District 3 miles from his intended point of origin (Hayne, 1968).

G. ASSOCIATED SETTLEMENT PATTERN.

The rectangular survey system is the most recent pattern to be ingrained into the surface of Louisiana. Much of the state was surveyed before settlement was permitted. Thus, many of the settlements in the newly surveyed areas are contemporaries of the rectangular survey. Towns were often laid out prior to settlement, but after the survey. In many such cases, where the railroad did not induce development at an angle, the street plan of the new town was set up along the lines of the original survey (Plate 12 and Fig. 31). The highway net which developed in the southwestern prairies also repeated the pattern (Fig. 32). The grid pattern of roads is strongly developed in the area settled by farmers who came from the Middle West, and who were
Irregularities in rectangular surveys of Concordia Parish. On the western side, south of Catahoula Lake and in the central area, waves caused by mismatched sections may be clearly seen. Such mismatched section lines are common throughout the state. On the eastern side and south-central area, a rather large gap appears where the surveys failed to tie. This gap runs a distance of approximately 23 miles. Another similar gap is found in northern St. Landry and southern Avoyelles parishes.
Sketch from Thomas Bilbo's field notes. Due to the lack of natural landmarks, surveyors sometimes became lost in the coastal marshes. Bilbo was notorious in this respect, once beginning a survey three miles from his intended point of origin. This sketch is reproduced from Thomas Bilbo's field book on a page done December 8, 1838. Courtesy Louisiana State Land Office.
A portion of Acadia Parish surveyed by the rectangular method. The center of Rayne (northeast part of the photograph) lies at the intersection of quarter-section lines. Compare this grid street plan of Rayne and its surrounding rectangular fields with the Roman centuriation shown in Figure 22 above. Photograph courtesy Edgar Tobin Aerial Surveys, San Antonio, Texas.
A portion of the Jefferson Davis Parish road map showing the close adherence of the road net to section lines, even to the survey errors (see the series of wavy section lines in the left center of the figure). Compare this pattern from the relatively level southwestern prairies with that of Figure 33 from the hill country of Vernon Parish. Louisiana Department of Highways.
accustomed to a grid-patterned landscape. Not only did the roads follow section lines, the fields tended to be rectangular, and the dispersed farmsteads characteristic of the midwestern prairies were transmitted to prairie Louisiana. 21

In Denham Springs, east of Baton Rouge in Livingston Parish, one of the major north-south arteries which follows a range line (between Ranges 2 and 3 East, St. Helena Meridian), is called Range Road in the country and Range Avenue within the city limits (Plate 13). Shreveport's street plan is laid out along survey lines as well, with the major north-south and east-west streets following section lines. Line Avenue, a busy north-south thoroughfare, was constructed on the range line which separates Ranges 13 and 14 West, Louisiana Meridian (Fig. 31) (Wiegel, 1969).

The rectangular system has the advantages of survey before settlement, in much of Louisiana, a sequence which virtually eliminates the problem of overlapping boundaries which plagues the areas of irregularly surveyed land. Selling the land so divided was originally thought to be an excellent way of providing revenue for the federal government, but in Louisiana this was never an effective program.

Once oriented in this rectangular system it is relatively easy to travel in otherwise unfamiliar territory. Precise directions can readily be given to travelers where the roads are oriented according to the cardinal directions.

There are also disadvantages to the system, particularly as it was developed in Louisiana. Due to the great
Range Avenue in Denham Springs, Livingston Parish. This street, which runs from left to right in the foreground, was constructed on the range line between Ranges 2 and 3 East, St. Helena Meridian.
delays in completing surveys, many persons who might have settled in Louisiana elected to locate elsewhere rather than to wait for the lands of Louisiana to be subdivided (Elliott, 1961, pp. 50-51). Further, persons who were accustomed to selecting what they considered to be the best land were frustrated by having to take the bad lands with the good.

Hildegard Binder Johnson pointed out (Johnson, 1957, pp. 346-348) that the regular shape of farms in the rectangular system greatly facilitates collection of information on areas planted to various crops, and that the system also gives:

... a simple, complete, determinative accounting system of the land. But the straight line, so simple to arrive at out of doors with two sticks in the ground and a rope or string stretched between them, is not of nature. It is an expression of control by man (Johnson, p. 347).

The farmer, however, must work with the soils, trees, slopes, and streams, largely as he finds them. He can do little to change the basic arrangement of the terrain, and must thus adapt his agriculture to the surface of the earth by means of curves and irregular clearings, especially in pioneering virgin or second growth forest lands and on uneven surfaces. This is to say that the most efficient use of the land is the ecological use of the land. The rectangular division of property is ideally suited to relatively level to slightly rolling terrain, such as the prairies of the southwestern Louisiana. For hilly or dissected areas, this type of division may be something less than the best way to cope
with the problem. It was seen earlier that settlers ac-
customed to a long lot (arpent) division flatly refused to
buy property which was rectangularly subdivided where part
of the land was ill-drained, even where they wanted a
portion of the swamp. Their reasons may have been cultural
preferences in part, but a major complaint was that the
rectangular survey had no regular solution to the problem
of apportioning bad lands with the good.
NOTES TO CHAPTER IV

1An important facet of the surveys of public lands in Louisiana is that the great bulk of the surveying was done by contract. Contract surveyors were to be bonded for double the value of the contract to insure accurate performance. In practice, grossly erroneous and sometimes fraudulent surveys were perpetrated, but the Surveyors General were reluctant to foreclose the bonds for fear of losing the surveyors they had. The contracting surveyor was responsible for the execution of the survey and subcontracts were illegal. For a sample of the type of contract used, see Appendix IV, p. 200.

Individual landholdings might be distributed as individual assignments or by the drawing of lots, a condition which obtained in the Italian land reform of A.D. 1950 (Kish, 1962, p. 234). The size of parcels distributed to veterans depended upon their rank—otherwise the size of the grant was dependent upon the quality of the land.

3The pertinent sheets are Nederlanden Topographische Dienst, Chromo-Topographische Kart des Rijks, Sheet No. 280 (Beets) and Sheet No. 296 (Midden Beemster), scale 1: 25,000.

Another, possibly more ancient, rectangular system is that which is believed to have originated in China. Variously known as the Jo-ri and Handen system, it received especial momentum in the T'ang Dynasty of China. Jo-ri divisions are arranged in groups of nine lots, three lots on a side. The idea apparently originated in China and diffused thence to Korea and Japan. Many large cities on the Chinese mainland as well as adjacent, culturally related areas are characterized by a grid street plan, based on this survey. It is evident from an interview with Dr. Chan Lee of Seoul National University, South Korea, that there are few similarities between Roman centuriation and the American rectangular system on the one hand, and the Jo-ri system, other than a grid appearance. The Jo-ri has no point of origin, principal meridian, or base line.

5The 31st parallel became the base line for the St. Stephen's, Washington, St. Helena, and Louisiana meridians (Treat, 1910, p. 190).
Original survey plats of each surveyed township are filed according to these subdivisions in the Louisiana State Land Office, 6th Floor, State Capitol, Baton Rouge. Ironically, there is no mention of the principal meridian on these survey plats, so there are some townships which have the same numerical designation.

See the theses of Downs (1960) and Elliott (1961) for details on the difficulties incurred in the surveys of the Greensburg District.

Acquiring a good compass in those days was no small investment, for a good instrument cost from $65 to $75.

By 1844, a circular, "General Instructions to U.S. Deputy Surveyors. For the District of Louisiana" was available.

It was known from the outset that it would be impossible to run lines "according to the true meridian" and have the townships uniformly six miles square. The convergence of the meridians would cause the townships to become increasingly narrow as the surveys progressed poleward from the base line. In spite of this, no effort was made to compensate for convergence until the Manual of 1855 was issued. Provision was made for dividing districts into 24-mile tracts, running standard parallels at intervals of four townships north of the base line. By the time this had become standard practice, the grid pattern had already been laid down in Louisiana.

Commissioner of the GLO, George Graham directed that field notes and plats be delivered to the register of the district land office for approval. If the survey was approved, a number was to be assigned to each private claim and each unclaimed regular section or tract in that township, beginning with number 1. Thus, if the regular sections one through nine included three private claims, these sections were to be numbered one through nine. This plan was to be carried throughout the township, and in this case, if there were no other private claims, the section in the southeastern corner would be numbered 39 (George Graham to Silas Dinsmoor, May 7, 1824). This procedure was apparently not followed in the successive resurveys of the Greensburg District between 1844 and 1852 (Elliott, 1961, pp. 72-88), for irregularly surveyed sections appear in 1969 as numbers above 36.

The Rittenhouse brothers, David and Benjamin, were fine craftsmen and together they produced some of the finest American surveying instruments of the period. Thus, an exceedingly fine compass exhibiting outstanding workmanship
might have been thought of as an instrument of "Rittenhouse construction" (Warren J. Danzenbaker, Department of Science and Technology, Smithsonian Institution, personal communication, February 19, 1969).

With any real discrepancy from the horizontal, however, this practice would be of little avail.

Stewart (1935, p. 121) has an illustration from the Manual of 1855 which shows the ways in which corners were to be constructed.

Eighty-eight feet from the left bank of the Mississippi, Andrew Ellicott erected a square post 10 feet high, surrounded by a mound 8 feet high. At this point, which came to be known as Ellicott's point, the following data were inscribed: on the south side, a crown with the letter R underneath; on the north side, the letters U.S.; on the west side, facing the Mississippi, Agosto 18th, 1798, 31° Lat. N. (Mrs. Dunbar Rowland. Life, Letters, and Papers of William Dunbar. Jackson, Mississippi: Mississippi Historical Society, 1930, p. 81).

The lands east of the Mississippi are surveyed on the basis of the 31st parallel and the St. Helena Meridian, 91° 11' west of Greenwich. This second meridian, surveyed in 1822, runs through Baton Rouge High School (Donaldson, 1844, p. 181).

When reduced to the scale of Fig. 27, these irregularities are not apparent, but they are sufficient to create considerable consequent irregularities in the arrangements of township and range lines.

Surveys accomplish two things. The first, and most obvious is the demarcation of the bounds of a property by establishing corners and lines on the earth's surface. The second is to furnish a means by which a given tract may be identified and distinguished from all other tracts. The two parts are inseparable and of great importance.

Though it was known at the outset that error would be introduced if correction lines were not established, it was felt that it was more expedient to get the basic grid pattern established. Secretary of the Treasury Gallatin, therefore, enjoined Briggs to sacrifice some of the precision of survey in order to expedite the establishment of American settlements in the western area (above p. 143f.)

The writer is very much indebted to Edgar Tobin Aerial Surveys of San Antonio, Texas, for providing such a map for the purpose of this study (Edgar Tobin Aerial
Rectangular surveys prior to settlement did not necessitate a corresponding gridiron pattern of roads, however. See Fig. 33. Surface irregularities in the hilly areas were largely responsible for the spider web roadnet.
A section of the Vernon Parish road map which shows little correlation with the survey system. In relatively level terrain, such as the prairies, there is a high degree of correlation (Figure 32 above). This area, however, represents one of the more hilly parts of the state, and roads have been constructed accordingly. Note the Louisiana Meridian in the eastern portion of the figure. Louisiana Department of Highways.
CONCLUSION

Of Louisiana's cadastral systems, at least three—the arpent, irregular, and rectangular—can be demonstrated to have ancient genetic roots in the Old World. It is probable that the sitio likewise has ancient European origins. The introduction, spread, and present appearance of these cadastral systems in Louisiana comprise this dissertation. Survey systems impart the warp and weft to the fabric of the landscape. Though they are not always obvious at the surface, their effects are vivid from the air and on maps, and, once woven into the fiber of the landscape by usage, these patterns persist. Cadastral patterns are among the most slowly changing elements of the cultural landscape (Kniffen, 1960, p. 23).

In Louisiana, four patterns have been woven into the landscape in different types of areas, often by peoples of different cultures. It is difficult to observe the effect or appearance of these patterns from the ground, because the observer's field of view is limited in nearly level or heavily wooded terrain. In mountainous areas where the observer can rise above the general level terrain, the patterns are clearly visible in the lands below. In Louisiana, however, one still has distinctly different feelings when
driving through the arpent, irregular, and rectangular survey areas. The spacing of lots fronting on roads which follow streams and the attenuated nature of such settlements gives the landscape a distinctly different personality than that of the dispersed settlement pattern and twisting, turning roads associated with the irregular system. There is a completely different regional flavor in the relatively flat prairies with their straight roads which usually intersect at right angles or make 90° turns. The settlements here tend to be at cross-roads, and grid-plan towns and cities are more common here (as in the case of Rayne and Shreveport--Plate 12 and Fig. 31). It should be noted that the survey system is but one element of the cultural landscape which adds to the whole regional "feel." In only a few instances can one really see the pattern the survey lines make on the ground. In selected areas, such as very narrow arpent lots south of Baton Rouge, along Louisiana Highway 1; in parts of New Orleans (Fig. 10), and at the apex of l'Éventail (Fig. 11) one can observe the arpent system. In other areas of the state, elements of the survey systems may only be detected by reference to the cardinal points, or by the regular spacing of roads along a township line.

Once the pattern has been ingrained in the landscape by usage, and the land divided and subdivided according to the peculiarities of that system, man becomes influenced by or subjected to, these concepts of his own creation. In
Louisiana, he has adjusted to these four systems which have become artifacts in the landscape. Along the streams in southern Louisiana, long-lot farms and ribbon settlements persist, as in the case of Thibodaux and other places along Bayou Lafourche. Once established, radiating street patterns, like that of New Orleans (Fig. 10), continue in use. In rectangularly-surveyed areas where cities outgrow their original limits, the newly incorporated lands may repeat the survey pattern in the form of the street plan (Fig. 31, Shreveport).

Certain kinds of survey systems appear to pre-adapt their bearers for dealing with special kinds of land. In colonial Louisiana, when the major routes were streams, and the backcountry was often poorly drained, the arpent system was peculiarly adapted to the narrow strips of useful land. This system had a long history of usage in similar environments in Europe. Knipmeyer (1956, p. 32) maintained that the system of long lots would have been used by the early French colonists in Louisiana regardless of the terrain they encountered. The system they introduced was not devised to cope with the swampy terrain; it was the traditional way to divide land. Studies of the antecedents of the arpent system indicate that this strip layout may have been originally devised to cope with low, ill-drained lands, however. The fact remains that the arpent system is uniquely adapted to an equitable division of alluvial lands in Louisiana.

In the hilly lands of the Florida Parishes, the
irregular system prevails. That system dominates because the Anglo-Saxons of the Upland South preferred it, but it is also signally adjusted to uneven terrain. The farmer selects the kinds of land he knows best, and since his fields are generally of an irregular shape, he may use contoured or straight furrows as the situation demands, or as he prefers. His mete of land may be allocated on the basis of what he wants, and not confined to a long strip or a rectangular straitjacket.

Survey systems may persist for long periods of time, even millenia, as in the case of the centuriae of the Roman Empire, if they have relevance to the culture (anthropological and agricultural) of the region in which they are found. Once the system has become accepted, man adjusts other systems to it and the pattern becomes part of the cultural landscape. The shape of the parcel held by an individual may limit the reasonable shapes and orientation of his fields and the way he plows them. Thus the arpent farmer finds long, straight furrows to be the most logical for his situation. The farmer with an irregular plot in the Florida Parishes or the rice farmer in Acadia Parish with a square quarter-section are not likely to be so limited. In Louisiana, the parish and police jury ward boundaries also follow survey lines. In rectangularly surveyed areas they are likely to be more nearly square than they are in irregular or arpent survey areas. The configuration of roads and highways is also greatly affected by the pattern of the
cadastral survey.

Most would admit that the description and subdivision of rectangularly divided properties are simpler than in the case of irregularly surveyed lands, but the expense and difficulty involved in resurvey and redistribution preclude it and the irregularly surveyed area with its congenital difficulties will continue to persist. Likewise, the sitios represent anachronisms in the cadastral map. They were laid out with no apparent thought to the future. Squares and rectangles which are not oriented to any particular direction will not completely fill an area. Small areas will remain unsurveyed, or else there will be overlaps and consequent boundary disputes. Fortunately, this survey type was short-lived in Louisiana. In other parts of the New World, Spain employed a similar circular survey which was characterized by the problems mentioned above. These were similar to the problems which plague inhabitants of irregularly surveyed lands. Figure 20 illustrates a Louisiana sitio which overlaps, or is overlapped by, a conflicting claim.

The main purpose of this dissertation has been to explore the antecedents, distribution, and characteristics of the four survey systems which have been used in Louisiana. Some other lines of investigation might reward subsequent study. Settlement patterns associated with each cadastral pattern were briefly sketched, but could be pursued in detail. No attempt was made, for example, to systematically compare street pattern, levees, drainage canals, or density
of roads. Spanish law stipulated that new settlers who obtained lands were to clear and put into cultivation, within three years, all the front of their concessions to a depth of at least two arpents. Failure to comply meant the land would revert to the royal domain. Air photographs were examined until it became apparent that useful land has been cleared to its maximum useful depth. Poor or marginal land was either passed over or abandoned to wild vegetation. There may, however, be some indication of compliance with the law to be found in the cultural landscape, such as a relict two-arpent road or pattern of buildings.

Another line of research might be a comparison of field patterns and sizes among the four systems. The writer alluded to the relationship between property boundaries and fundamental survey lines. Statistical comparisons would show the degree of correlation much more accurately than the visual method. School districts probably correlate to a great extent with the fundamental survey lines, as one would expect of civil boundaries. The road pattern was obviously closely related to the survey system in parts of the state. It might be interesting to compare the number and size of streams crossed by bridges in the four systems. Several other problems might also be found.

The ideal survey system for all kinds of terrain has yet to be developed. From the experience in Louisiana, such a system might incorporate the abilities of the irregular and arpent systems to cope with rough terrain and partially
inundated lands, and the rectangular system's utility in relatively smooth terrain and orientation with the cardinal directions, and ties with recoverable, astronomically determined corners.
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APPENDIX I

BRITISH PROCLAMATION AND ORDINANCE

Proclamation of the King of Great Britain
By the King--A Proclamation.--George R.

Whereas we have taken into our royal consideration the extensive and valuable acquisitions in America, secured to our crown by the late definitive treaty of peace concluded at Paris the 10th day of February last; and being desirous that all our loving subjects, as well of our kingdoms as of our colonies in America, may avail themselves, with all convenient speed, of the great benefits and advantages which must accrue therefrom to their commerce, manufactures, and navigation, we have thought fit, with the advice of our privy council, to issue this our royal proclamation, hereby to publish and declare to all our loving subjects that we have, with the advice of our said privy council, granted our letters patent under our great seal of Great Britain to erect, within the countries and islands ceded and confirmed to us by the said treaty, four distinct and separate governments, styled and called by the names of Quebec, East Florida, West Florida, and Grenada, and limited and bounded as follows, viz: 

First. The government of Quebec, bounded on the Labrador coast by the river St. John, and from thence by a line drawn from the head of that river, through the Lake St. John, to the south end of the Lake Nipissim; from whence the said line, crossing the river St. Lawrence, and the Lake Champlain, in 45 degrees of north latitude, passes along the high lands which divide the rivers that empty themselves into the said river St. Lawrence from those which fall into the sea; and also along the north coast of the Baye des Charleurs and the coast of the Gulf of St. Lawrence, to Cape Rosiers, and from thence, crossing the mouth of the river St. Lawrence by the west end of the island of Anticosti, terminates at the aforesaid river St. John.

Secondly. The government of the East Florida, bounded
to the westward by the Gulf of Mexico and the Apalachicola river; to the northward by a line drawn from that part of the said river where the Chatahoochie and Flint rivers meet, to the source of St. Mary's river, and by the course of the said river to the Atlantic ocean; and to the east and south by the Atlantic ocean and the Gulf of Florida, including all islands within six leagues of the sea-coast.

Thirdly. The government of West Florida, bounded to the southward by the Gulf of Mexico, including all islands within six leagues of the coast, from the river Apalachicola to Lake Pontchartrain; to the westward by the said lake, the Lake Maurepas, and the river Mississippi; to the northward, by a line drawn due east from that part of the river Mississippi which lies in thirty-one degrees north latitude, to the river Apalachicola or Chatahoochie, and to the eastward by the said river.

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**British Ordinance**

The following ordinance was obtained from among the manuscripts delivered to the minister of the United States at London, and is the only paper on the subject:

His Majesty's instructions, &c.

West Florida, Pensacola, November 1, 1765.

Whereas nothing can more effectually tend to the speedy settling our said colony, the security of the property of our subjects, and the advancement of our revenue, than the disposal of such lands as are our property upon reasonable terms, and the establishing a regular and proper method of proceeding with respect to the passing grant of such lands, it is, therefore, our will and pleasure that all and every person and persons who shall apply to you for any grant or grants of land shall, previous to their obtaining the same, make it appear before you, in council, that they are in a condition to cultivate and improve the same, by settling thereon, in proportion to the quantity of acres desired, a sufficient number of white persons and negroes; and, in case you should, upon a consideration of the circumstances of the person or persons applying for such grants, think it advisable to pass the same, in such case you are to cause a warrant to be drawn up, directed to the surveyor general, or other proper officers, empowering him or them to make a faithful and exact survey of the lands so petitioned for,
and to return the said warrant within six months, at the
furthest, from the date thereof, with a plat or description
of the land so surveyed thereunto annexed. Provided, That
you do take care that, before any such warrant is issued as
aforesaid, a docket thereof be entered in the auditor's and
register's offices; and when the warrant shall be returned
by the said surveyor, or other proper officer, the grants
shall be made out in due form, and the terms and conditions
required by these our instructions be particularly and ex-
pressly mentioned in the respective grants. And it is our
further will and pleasure that the said grants shall be
registered within six months from the date thereof, in the
register's office, and a docket thereof be also entered in
our auditor's office, in case such establishment shall take
place in our said province, or that, in default of such
entry, such grant shall be void; copies of all which entries
shall be returned regularly by the proper officer to our
commissioners of our treasury, and to our commissioners for
trade and plantations, within six months from the date
thereof.

And whereas great inconveniences have arisen in many of
our colonies in America, from the granting excessive quan-
tities of land to particular persons, who have never culti-
vated or settled it, and have thereby prevented others, more
industrious, from improving the same; in order, therefore,
to prevent the like inconveniences for the future, you are
to take especial care that, in all grants to be made by you,
by and with the advice of our council, to persons applying
for the same, the quantity be in proportion to their ability
to cultivate; and you are hereby directed to observe the
following directions and regulations in all grants to be
made by you, viz:

That one hundred acres of land be granted to every per-
son, being master or mistress of a family, for himself, or
herself, and fifty acres for every white or black man, woman,
or child, of which such person's family shall consist, at
the actual time of making the grant; and in case any person
applying to you for grants of lands shall be desirous of
taking up a larger quantity than the actual number of per-
sons in his or her family would entitle such person to take
up, it is our will and pleasure, and you are hereby allowed
and permitted, to grant unto every such person or persons
such further quantity of land as they may desire, not ex-
ceeding one thousand acres over and above what they are
entitled to by the number of persons in their respective
families: Provided, it shall appear to you that they are in
a condition and intention to cultivate the same: And pro-
vided, also, that they do pay to the receiver of our quit-
rents, or to such other officer as shall be appointed to
receive the same, the sum of five shillings only for every
fifty acres so granted, on the day of the date of the grant; that every grantee, upon giving proof that he or she has fulfilled the terms and conditions of his or her grant, shall be entitled to another grant in proportion, and upon the conditions above mentioned: that, for every fifty acres of lands accounted plantable, each patentee shall be obliged, within three years after the date of his patent, to clear and work three acres at least in that part of his tract which he shall judge most convenient and advantageous, or else to clear and drain three acres of swampy or sunken grounds, or drain three acres of marsh, if any such be within the bounds of his grant: that, for every fifty acres of land accounted barren, every patentee shall be obliged, within three years after the date of his grant, to put and keep on his land three neat cattle, which number he shall be obliged to continue on his land until three acres of every fifty be fully cleared and improved: that if any person shall take up a tract of land, wherein there shall be no part fit for present cultivation, without manuring and improving the same, every such grantee shall be obliged, within three years from the date of his grant, to erect, on some part of his land, one good dwelling-house, to contain at least twenty feet in length and sixteen in breadth, and also to put on his land the like number of three neat head of cattle for every fifty acres: that if any person who shall take up any stony or rocky grounds, not fit for culture or pasture, shall, within three years after the passage of his grant, begin to employ thereon, and so to continue for three years next ensuing, in digging any stone quarry or mine, one good and able hand for every hundred acres of such tract, it shall be accounted a sufficient cultivation and improvement; that every three acres that shall be cleared and worked as aforesaid, and every three acres which shall be cleared and drained as aforesaid, shall be accounted a sufficient seating, planting, cultivation, and improvement, to save, forever, from forfeiture, fifty acres of land in any part of the tract contained within the said patent; and the patentee shall be at liberty to withdraw his stock, or to forbear working, in any quarry or mine, in proportion to such cultivation and improvement as shall be made upon the plantable lands, or upon the swampy or sunken grounds and marshes which shall be included in the same patent: that, when any person who shall hereafter take up and patent any land shall have seated, planted, and cultivated or improved the said land, or any part of it, according to the directions and conditions above mentioned, such patentee may make proof of such seating, planting, cultivation, and improvement, in the general court, or in the court of the county, district, or precinct, where such land shall lie, and have such proof certified to the register's office, and there entered with the record of the said patent, a copy of which shall be admitted, on any trial, to prove the seating and planting
such land. And, lastly, in order to ascertain the quantity of plantable and barren land contained in each grant hereafter to be made within our said province, you are to take especial care that, in all surveys hereafter to be made, every surveyor be required and enjoined to take particular notice, according to the best of his judgment and understanding, how much of the land surveyed is plantable, and how much of it is barren and unfit for cultivation, and, accordingly, to insert in the survey and plat by him to be returned into the register's office, the true quantity of each kind of land. And it is our further will and pleasure that in all grants of land to be made by you, as aforesaid, regard be had to the profitable and unprofitable acres, so that each grantee may have a proportionable number of one sort and the other; as, likewise, that the breadth of each tract of land to be hereafter granted be one-third of the length of such tract, and that the length of each tract do not extend along the banks of any river, but into the main land; that thereby the said grantees may have each a convenient share of what accommodation the said river may afford for navigation or otherwise. And it is our will and pleasure that in every grant of land within our said province, to be hereafter made by you, you take especial care that a clause be inserted reserving to us, our heirs, and successors, a quit-rent of one halfpenny sterling per acre, payable at the feast of St. Michael, every year, the first payment to commence on the said feast of St. Michael, which shall first happen after the expiration of two years from the date of the grant, and to be payable on every ensuing feast of St. Michael, or within fourteen days after.

Entered at Pensacola, November 3, 1765.

JOHN HANNAY, Register.
APPENDIX II

COMPLETE BRITISH GRANT

British Government: Letters Patent

to: for 1000 acres

Mathew McHenry: Dated December 15, 1768.

WEST FLORIDA) IS.

George the Third, by the grace of God, of Great Britain, France, and Ireland, King, Defender of the Faith, and so forth:

TO ALL TO WHOM THESE PRESENTS SHALL COME GREETING:

KNOW YE THAT WE, of our special grace, certain knowledge, and mere motion have given and granted, and by these presents for us, our heirs and successors, do give and grant unto Mathew McHenry, his heirs and assigns, all that tract of land situated opposite to the French settlement of Pointe Coupee on the River Mississippi, butting and bounding northerly on lands granted and laid out unto Daniel Clark, westerly on the River Mississippi, and on all other sides by vacant land in our province of West Florida, and having such shape, form, and marks, both natural and artificial, as are represented in the plat thereof, hereunto annexed, as drawn by our surveyor general of lands, which said tract of land contains 1000 acres and is bounded as, in, and by the further certificate, hereunto likewise annexed, under the hand of our said surveyor general of lands in our said province, may more fully and at large appear. Together with all woods, underwoods, timber and timber trees, lakes, ponds, fishings, waters, watercourses, profits, commodities, hereditaments, and appurtenances whatsoever thereunto belonging, or in anywise appertaining. Together, also, with privilege of hunting, hawking, and fowling in and upon the same; and all mines and minerals, reserving unto us, our heirs and successors, all mines of gold and silver, to have and to hold the said tract of land, and all and singular the
premises as hereby granted with all appurtenances, unto the
said Mathew McHenry, his heirs and assigns, forever in free
and common socage; yielding and paying unto us, our heirs
and successors, or to the receiver general of our quitrents
for the time being, or to such other officer as shall be
appointed to receive the same, a quitrent of one-half penny
sterling per acre at the feast of St. Michael every year;
the first payment to commence on the said feast of St.
Michael which shall first happen after the expiration of two
years from the date hereof, or within fourteen days of the
said feast, annually.

PROVIDED ALWAYS, and this present grant is upon condi-
tion, nevertheless, that the said Mathew McHenry, his heirs
or assigns, shall and do, within three years after the date
hereof, for every 50 acres of plantable land hereby granted,
clear and cultivate three acres at least in that part there-
of which he or they shall judge most convenient and advan-
tageous; or else do clear and drain three acres of swampy or
sunken ground; or do drain three acres of marsh, if any such
shall be contained therein; and shall further, within the
time aforesaid, put and keep upon every 50 acres thereof
accounted barren three meat cattle, and cultivate the same
thereon until three acres be fully cleared and improved.
And if it shall so happen that there be no part of the said
tract of land fit for present cultivation without manuring
and improving the same, if the said Mathew McHenry, his
heirs or assigns, shall, within three years from the date
hereof, erect on some part of the said tract of land one
good dwelling house to contain at least 20 feet in length
and 16 feet in breadth, and put on his said land the like
number of three meat cattle, as aforesaid, on every 50 acres
therein contained; or otherwise, if any part of the said
tract of land shall be stony or rocky ground, not fit for
culture or pasture, shall and do, within three years as
aforesaid, besides erecting the said house begin to employ
thereon, and continue to work for three years next ensuing
in digging any stone quarry or mine, one good and able hand
for every 50 acres thereof, it shall be accounted a suffi-
cient cultivation and improvement.

PROVIDED ALSO THAT every three acres which shall be
cleared and worked or cleared and drained, as aforesaid,
shall further be accounted a sufficient seating and planting,
cultivation and improvement to save forever from forfeiture
50 acres of land in any part of the tract hereby granted,
and the said Mathew McHenry, his heirs and assigns, shall be
at liberty to withdraw his or their stock, or to forbear
working in any stone quarry or mine, in proportion to such
improvement aforesaid as shall be made upon the plantable
lands, swamps, sunken grounds, or marshes therein contained.
Oaks

Vacant land, 187 acres, 57 chains long.

Oak land

Boat and swamp.

Byrnes School

Byrnes Swamp

Daniel Blake's land

Hilly and broken land.

Mathew M. Henry's land

100 acres of land.
PROVIDED ALWAYS THAT this grant shall be duly registered in the register's office of this province within six months from the date hereof, and also that a docket thereof shall be entered in the auditor's office within the same time, if such establishment shall take place in this province.

PROVIDED ALWAYS THAT the said Mathew McHenry, his heirs and assigns, at any time hereafter having seated, planted, cultivated, and improved the said land, or any part thereof, according to the directions and conditions above-mentioned, may make proof of such seating, planting, cultivation, and improvement in the general court or in the court of the county, district, or precinct where the said land lieth, and have such proof certified at the register's office and there entered with the record of this grant, a copy of which, duly attested, shall be admitted on any trial to prove the seating and planting of said land.

PROVIDED ALWAYS, NEVERTHELESS, THAT if the said Mathew McHenry, his heirs and assigns, shall not in all things fully comply with and fulfill the respective directions and conditions hereinabove set forth for the proper cultivation of the said land within the time hereinabove limited for the completion thereof; or if the said Mathew McHenry, his heirs or assigns, shall not pay to us, our heirs and successors, or to the receiver general of our quitrent, or to the proper officer appointed to receive the same, the said quitrent of one-half penny sterling per acre on the said feast of St. Michael, or within fourteen days after, annually for every acre contained in this grant; that then, and in either of these cases respectively, this grant shall be void — anything therein contained to the contrary notwithstanding; and the said lands, tenements, hereditaments, and premises hereby specified, and every part and parcel thereof, shall revert to us, our heirs and successors, fully and absolutely as if the same had never been granted.

Given under the great seal of our province of West Florida. Witness our trusty and well-beloved Montfort Browne, Esquire, our Lieutenant Governor, and Commander-in-chief in and over our said province, at Pensacola, the fifteenth day of December, in the year of our Lord one thousand seven hundred and sixty-eight, and in the ninth year of our reign.

MONTFORT BROWNE

Signed in council the 15th day of December, 1768.

DANIEL CLARK, D.C.C.

("Plat here")
Pursuant to a warrant from His Honor, Montfort Browne, Esquire, Lieutenant Governor, and Commander-in-chief in and over His Majesty's said province, to me directed, bearing date the twenty-fourth day of February, anno Domini 1768.

I have caused to be surveyed and measured out unto Mathew McHenry a plantation or tract of land containing 1000 acres situated opposite the French settlement of Pointe Coupee on the River Mississippi; butting and bounding northerly on land granted and laid out unto Daniel Clark, westerly on the River Mississippi, and on all other sides by vacant land; and hath such forms and marks, both natural and artificial, as are fully represented in the plat annexed.

Certified this sixth day of July, 1768.

By ELIAS DURNFORD
Surveyor General
Complete British patent issued to Mathew McHenry December 15, 1768.

British Grants, 1768 - 1789.
Greensburg Land Claims
U.S. Land Office Archives
Baton Rouge, Louisiana (1942)
pp. 24 - 27.
To James O. Cosby,
Commissioner of Land Claims
West of Pearl River

Sir:

CLAIM A 185
I claim thirteen hundred and twenty
arpents of land situated in the District
of Baton Rouge, by virtue of an order of
survey from the Spanish Governor and of a
plat and certificate of survey. Said
land has been inhabited and cultivated
since the year 1805 up to this present
time.

Signed CALVIN SMITH

CLAIM D NO. 2
Moreover, I claim three hundred and fifty
arpents of land situated in the District
of Baton Rouge, by virtue of a complete
Spanish title dated the 24th of November
1803, which I herewith submit. Said land
has not been inhabited or cultivated.

Signed CALVIN SMITH
Baton Rouge, August 27, 1806

The deputy surveyor has surveyed and made a figurative plan of the land claimed by Calvin Smith, which is vacant, so that the interested party may take it to the office of the Tribunal in his district.

Signed GRAND-PRE

Written in English, copied verbatim

I, Ira C. Kneeland, Deputy Surveyor, appointed and commissioned by Don Vicente Sebastian Pintado, Surveyor General of West Florida, do certify that by order of His Excellency, Don Charles de Grand-Pré, Governor of Baton Rouge dated the 27th of August one thousand eight hundred and six, agreeable to said order, I have accurately surveyed for Calvin Smith a tract of land containing thirteen hundred and twenty arpents measured with the perch of Paris of eighteen feet of said city and counting one hundred square perches to the arpent agreeable to the custom of this province, which said tract of land is situated in the District of Baton Rouge, about five miles north of said fort and about two miles east of the River Mississippi and about the same distance N.E. of the town of Montesano, bounding north by Hipolite Mallet and Thomas Dalton, south by Calvin Smith and Abijah Russ, east by John Garcia and west by Isam Hillen A.S.P. Isham Hilling and vacant land, agreeable to the figurative plan in which are to be seen all the boundaries, both natural and artificial.

In testimony of which I have signed this instrument this twentieth day of October one thousand eight hundred and six.

Signed I.C. KNEELAND

Claim D No. 2

Written in Spanish

Spanish Government to Calvin Smith

Letters Patent for 350 arpents of land dated November 24, 1803

Juan Ventura Morales, Principal Paymaster of the Army, Provisional Intendant of the Royal Treasury of the Province of Louisiana and West Florida, Superintendent Subdelegate, Judge of arrivals of lands and royal grounds.
WHEREAS, Calvin Smith has appeared before this Tribunal requesting that there should be despatched in his favor a title or property to 350 arpents of land plain, in the District of Baton Rouge, granted to him by Manuel de Lemos, who was governor of this province, by decree of November 26, 1798, which was manifested with the measure certified by Charles Trudeau, Surveyor General, and the plan containing the same. I ordered them to be shown to the Fiscal of the royal treasury, and he, not opposing it by the decree of the 23rd of the present month, I ordered the solicited title to be despatched. Appearing from the said survey and figurative plan of the said 350 arpents of land plain, said land is situated in the District of Baton Rouge, about 2-1/2 miles east of the Mississippi River, and about 5-1/2 miles N. 1/4 N.E. of the fort, and is bounded on the north by land of Henry Thibodeau, on the south by that of Luther Smith, and on the east by royal lands.

And using the power conferred on this district, in the Name of the King, Our Master (God guard him), I confirm the said grant by the said governor to the said Calvin Smith of the 350 arpents of land plain contained in the survey, and the plan of the same. In consequence I give to him the entire and direct dominion of the property, so that, as his own, he may possess, cultivate and dispose of it at will; and I give him power to continue in its possession into which I put and maintain him without injury to a third person who has better right. With the condition of complying with articles 4, 5, 7 and 9 of the ordinance formed and published for this district on July 17, 1799, which he is to observe, as no ignorance excuses under the penalties imposed.

In testimony of which I ordered the present to be given, signed with my hand, sealed with the coat of my arms, and countersigned by the undersigned clerk of the royal treasury, who as for the principal office of accounts, will take an account of the same.

Given in New Orleans, November 24, 1803.

Signed

JUAN VENTURA MORALES
By order of the Intendant CARLOS XIMENES

Written in Spanish

An account is taken of the preceding title on L 153 as turned over and following of the book which is in my charge, destined to this object.
Signed CARLOS XIMENES

For the principal office of accounts of the army of the ministry of the royal treasury in our charge, an account is taken of this title at folio 32 of the book destined to this subject.

New Orleans, November 29, 1803.

Signed MANUEL ARMIRES

GILBERT LEONARD

Written in Spanish

Charles Trudeau, Royal and Private Surveyor of the Province of Louisiana, etc., in consequence of the decree of the Governor General who was Manuel Gayoso de Lemos, dated November 20th of last year, certifies that there has been measured and bounded, in favor and in the presence of Calvin Smith, and in the presence of both adjacent neighbors, a tract of 350 arpents of land plain measured with the perch of the City of Paris of 18 royal feet in length, according to the agrarian custom of this province, which land is situated in the District of Baton Rouge, about 2-1/2 miles east of the Mississippi River, and about 5-1/2 miles N. 1/4 N.E. of the fort, bounded on the north by land of Henry Thibodeau, on the south by that of Luther Smith and on the east by vacant royal lands. The boundaries are parallel and at right angles, running to the north 80° E. and N. 10° W. by the actual needle, which varies 8° 30' N.E.; in which boundaries there were designated the trees and monuments represented on the plan which serve as natural and artificial landmarks, etc., and in order that all the aforesaid may be evident, I give the present with the preceding figurative plan, made in conformity with the returns of the survey of January 16th of the current year. And as it appears by the plan and description of the Special Surveyor, Vicente Pintado, dated September 10th last, which were made by the said surveyor, Luther Smith and Henry Thibodeau assisting, I accredit all November 15, 1799.

Signed CHARLES TRUDEAU
Royal Surveyor

Louisiana 1799
District of Baton Rouge

Terms

W. 1329
CLAIM OF I, Charles Trudeau, Royal and Private Surveyor of the Province of Louisiana, etc., in consequence of the decree of the governor general, who was the deceased Manuel Gayoso de Lemos, under date of November 26 of the year just passed, certify that there was measured and bounded in favor and in the presence of Calvin Smith, and in the presence of both adjoining neighbors, a tract of land of 350 arpents plain, measured with the perch of the city of Paris of eighteen royal feet in length, according to the agrarian custom of this province; which land is situated in the District of Baton Rouge, about 2-1/2 miles east of the Mississippi River, and about 5-1/2 miles to the northeast; being bounded on one side by lands of Henry Thibodeaux and on the other by those of Luther Smith, and on the east by royal lands. The boundaries are parallel and at right angles, running to the north 8 degrees east and north 10 degrees west of the actual needle, its declination being 8 degrees thirty minutes to the northeast; in which boundaries are marked the trees and monuments on the figurative plan which indicate the natural and artificial boundaries, etc.

And in order that all the aforesaid may be evident, I give the present with the preceding figurative plan, made in conformity with the returns of survey of the sixteenth day of January of the present year, as is evident by the plan and certification of Surveyor Vicente Pintado, under date of September tenth of the year just passed, which was made by the surveyors, Luther Smith and Henry Thibodeaux; to all of which I certify.

November 15, 1799.

/Signed/ CHARLES TRUDEAU
Royal Surveyor


/Signed/ CHARLES TRUDEAU

Complete Spanish patent issued to Calvin Smith, November 15, 1799.

Book A, No. 2
Greensburg
U.S. Land Office Archives

Baton Rouge, Louisiana
1942

pp. 67-74
APPENDIX IV

CONTRACT FOR PRIVATE SURVEYS

General Land Office
Sept. 12th, 1823

Sir:

Finding that no contracts for surveying the public lands have been returned by you to this office with the view of securing uniformity in relation to this subject, I have taken the liberty to enclose the form of a contract for surveying the public lands as adopted by General Rector (appears) with a copy of my letter to him on the receipt of it. Altho a portion of the lands within your district is of such a character as to make it difficult to procure surveyors to run them out per crew for four dollars per mile, yet there is a large portion of them of a very different description, and for the surveying of which, for the reasons stated in my letter to Genl. Rector, I think it probable you might be able to reduce the rate per mile.

I allude to all the Choctaw Land District except a portion of that part lying between the Yazoo and Mississippi Rivers, the piney land in the land district east of the Island of New Orleans, and on that part of your surveying district lying west of the meridian of Opelousas Church, with the exception of the swamps on the Gulph of Mexico and the salt marshes of the Vermillion River where, from the height and thickness of the grass and the numbers of small bayous, the surveying will be very tedious. You will endeavor to make a survey of half a dollar a mile when you make the contracts for surveying the residues of the above mentioned parts of your district. At all events, you must save as much on the surveying of these lands as will cover the excess above $4.00 a mile which it may be necessary to incur in running the lines and making the surveys in the Mississippi swamps.

The meridian line mentioned in my letter of the 27th of Feby. to be extended to the Red River and to the Gulph of Mexico was not intended to be a continued meridian. The
nature of the country will require the line of a connection to be run on different meridians and from different points of the parallel line which has been or may be run.

The general object of my instructions to you has been to expedite as far as practicable the surveying of all that part of your district which is in any way connected with the surveying of private confirmed claims, and not to authorize at present the surveying of any townships unconnected with such claims other than those which you had been instructed to survey previous to my communication. You are, however, authorized to contract for the surveying of any of the lands which you may deem it expedient to survey under my former instructions on bayous, lakes and in conformity to the 2d section of the Act of the 3d of March 1811.

To secure the prompt uniform and economical survey of the private confirmed claims and preemptions in the several land districts where you have appointed principal deputy surveyors, it will, perhaps, be necessary that you should meet them at their respective land offices or that you should have a general meeting. In either case, the expense of travelling should be paid by the government; this, however, I cannot at present authorize as the President and Secretary of the Treasury are both absent.

I apprehend from the state of the Land Office at Opelousas that your presence there will be indispensably necessary before the books of that office can be correctly posted. If this necessity, however, should arise from your own inattention when register no allowance can be made for your travelling expense.

With sentiments of great respect and esteem

Your Obt. Servt.,

(Signed) GEO. GRAHAM

L. Wailes, Esqr.

Articles of Agreement had, made and concluded upon this (blank) day of (blank) in the year of Our Lord one thousand eight hundred and (blank) between William Rector, Surveyor of the lands of the United States in the states of Illinois and Missouri and Territory of Arkansas, acting for and in behalf of the United States of the one part, and (blank) of the other part.

WITNESSETH, that the said (blank) and in consideration of the terms, provisions, and covenants hereinafter expressed, and according to the true intent and meaning thereof, doth hereby covenant and agree with the said William Rector in his capacity aforesaid, that he the said (blank) personally will do and perform the following surveying agreeably to the laws of the United States and such instructions as may be given to him by the said William Rector, viz: (blank) and the said (blank) further covenants and agrees that if in the course of performing the surveys aforesaid any corner shall fall (whether of townships, sections or quarter sections) within any prairie where bearing trees within a reasonable distance from such course cannot be found, then and in that case, and in all such cases, he will erect mounds of earth or sod to perpetuate such corners. The mounds to be at least two feet six inches high and two feet six inches in diameter at the base. And the said (blank) further covenants and agrees that he will make out three neat and accurate plats and descriptions of each of the aforesaid townships and fractional townships which he shall survey as aforesaid, with all the lines thereof; according to their true length and breadth. And means shall be furnished by which the content of each and all the fractional sections can be calculated and ascertained, and that he will make the calculations of the content of each fractional section and set it down on the plats of the townships and fractional townships. And that he will complete the surveys, plats and descriptions as aforesaid and make returns thereof, together with the field notes to this office of the surveyor of the lands of the United States and Treasury aforesaid within (blank) months from the date hereof on the penalty of forfeititure and paying to the United States the sum of (blank) dollars, if default be made in any of the foregoing conditions.

And the said William Rector covenants and agrees, in his capacity aforesaid, that on the completion of the work in the manner aforesaid, there shall be paid to the said (blank) on account of the United States as a full compensation for the whole expense of surveying, making the plats, descriptions and calculations aforesaid (blank) dollars per mile for every mile and part of a mile that shall actually be
surveyed and marked (random lines and offsets not included) provided no member of Congress has any part in this contract.

IN TESTIMONY WHEREOF, the parties to this agreement have interchangeably set their hands and seal the day and year aforesaid.

(SEAL)

(SEAL)

Signed, sealed and delivered in the presence of

(No signatures)

APPENDIX V

GLOSSARY

The following are terms appearing in the text which are either not in common usage, or have different or special usage in this essay. The primary sources for these terms are the Oxford English Dictionary and Webster's New International Dictionary, 3rd Ed., Unabridged. Other specialized dictionaries or sources used are footnoted.

acre - originally, open country, untenanted forest land. Now taken as an acre of 160 square poles (43,560 sq. ft.). A square acre is 208 ft. on a side.

actuarius - see quintarius.

actus - the most commonly used basic unit of the Roman surveys, a unit 120 ft. square (Kish, 1962, p. 234).

agrimensores - Roman surveyors, also variously called finitores, mensores, divisores, and gromatici (Kish, 1962, p. 233).

Anglo-Saxons - persons of Anglo-Saxon British descent who migrated from the British Isles, especially northern Ireland and Scotland, to North America and gradually migrated southwestward via the Appalachian Mountain system into hill Louisiana and especially the Florida Parishes. Elsewhere these people are often known as Scotch-Irish.

arpent of Paris - 10 perches or 30 French fathoms, or 63.9654 yards, standardized in Louisiana at 192 feet. The square arpent is 100 square French perches. A square arpent is equal to 4091.5724 square yards. An acre is equivalent to 1.1829 superficial arpents.
base line - in the American rectangular survey system, one of two major guide lines. The base line is theoretically a true parallel of latitude. Township lines (q.v.) are drawn at six-mile intervals north and south of and parallel to this line.

basis line, basis meridian - early designations for the base line and principal meridian (q.v.).

bourn - as used here, a stake used to mark a boundary. Originally it was a boundary between fields; a limit.

cadastral, cadaster - pertaining to an official register of the quantity, value, and ownership of real estate, used in apportioning taxes. As used here, the term refers to the surveys of land for the above purposes.

cardo, cardo maximus - a cardo was one of two kinds of lines which ran perpendicular to each other in the centuriatio system (q.v.). The cardo was analogous to the range line (q.v.) in the American rectangular system. The decumanus maximus (q.v.) was analogous to the principal meridian of the American rectangular survey (Kish, 1962, p. 234-235).

cedula - a permit or order issued by the Spanish government.

centuria (pl. centuriae) - a division within the Roman centuriatio consisting of 100 lots of two iugera (one heredium) each. The centuria was the basic division of the Roman field surveys. A centuria was generally 2,400 feet square, with an area of 132 acres, or a little more than 1/5 the size of an American 640-acre section. The centuria determined the layout of fields, roads, and most other works of man in the Roman landscape (Kish, 1962, p. 234).

centuriatio, centuriation - the Roman grid-type survey, analogous to the American rectangular survey, but used only on arable lands (Kish, 1962, p. 238).

commentarii - a Roman surveyor's field notes (Kish, 1962, p. 240).

concession - a grant by a government of land for some specified purpose. As used here, it is a synonym for land grant.

consular roads - trunk roads in the Roman road system. The decumanus maximus usually coincided with the consular road in a survey area (Kish, 1962, p. 236).
**cordel** - a cord or rope made from the fiber of the pita plant (q.v.) and used by the Spanish for surveying. In Spanish a **cordel** is a thin rope or line; a distance of five steps (Cuba) or a land measure of about one square chain (**Cassells Spanish Dictionary**, p. 256). The French equivalent of the term is cordeau.

**decumanus, d. maximus** - in the Roman centuriatio the **decumanus** was analogous to the township line of the American rectangular system. The **d. maximus** was equivalent to the base line. These lines were most commonly oriented east-west, but nearly always followed the long axis of the survey area (**Kish**, 1962, pp. 234-235).

**demense** - an estate or land of which the owner is in possession; originally the term meant property belonging to a lord. The royal demense was the private property of the crown.

**éventail** (n.m. - a fan, especially a folding fan. **Cassells French Dictionary**, p. 324). In Louisiana, the area known as l'Éventail is found in T8S, R5E, Louisiana Meridian, in northernmost Lafayette Parish.

**fee simple** - a fee (estate in land) without limitation to any class or heirs or restriction upon transfer or conveyance.

**fen** - an area of low swampy land, moor, or marsh, specifically the Fens, a low-lying area in eastern England, north of the Thames Estuary; a broad marsh. Also used of coastal marshlands of northwest Europe. The term is imprecise and has more regional than specific meaning. The most widely used definition is an area of low land covered wholly or partially with water, or subject to frequent inundation; a marsh.

**finitores** - see agrimensores.

**float, floating grant** - a land grant which specified the amount of land granted, but not the location.

**forma** - a rough field sketch made by the Roman agrimensor or the finished plat which he filed in the central archives in Rome (**Kish**, 1962, p. 240).

**funiculum** - (Latin, "a rope"). A cord or rope used for surveying in ancient times, a forerunner of the chain.

**G.L.O.** - **General Land Office**. A federal governmental agency now subsumed under the Bureau of Land Management, which was responsible for the surveys of public lands of the
United States, hence the survey system used by that agency (synonyms are rectangular surveys, township and range surveys, etc.).

**Gewannflur** - a European field system which consists of fields of long, narrow strips or furlongs (Gewanne), laid out in a definite pattern.

**gnomon** - a right-angled figure resembling a carpenter's square. Irregularly surveyed lands in the Florida Parishes often followed the shape of a gnomon.

**groma** - the major instrument of the Roman surveyor. It consisted of a rod with a freely moving arm on top, and a cross pivoting on the end of the horizontal arm. The surveyor sighted along these arms when laying out a centuria (Kish, 1962, pp. 241-242, Fig. 11).

**gromatici** - those who used a groma, thus, Roman surveyors (Kish, 1962, p. 241).

**headright** - land granted according to the number of individuals ("heads") in a given family. Children and slaves were usually counted in allocating a headright grant.

**heredium** - a homestead in ancient Rome, consisting of two iugera. This unit is comparable to the German Erbhof, or inherited farm. A heredium amounted to 57,600 sq. ft., or 1.32 acres (Kish, 1962, pp. 233-234).

**hide** - originally, the amount of land necessary for the support of a free peasant family with its dependents. At an early time it was defined as being as much land as could be tilled with one plow in a year. The actual amount varied from place to place and through time. See also Hufe.

**Hufe** (pl. Hufen) German - hide (of land). This was the normal unit of land tenure in Germany.

**iugerum** (iugerum), pl. iugera - the most common basic subdivision of the centuria. An iugerum measured 240 x 120 feet, or 28,800 sq. ft. Analogous to the English hide or German Hufe (Kish, 1962, p. 234).

**league** - originally a Celtic (Gaulish) word. In French linear measure it is 84 arpents (16,128 English feet), 3.45 land miles, or three nautical miles. The square league amounts to 7,056 square arpents, or about 4,500 acres.

**liege homage** - bound to loyalty or fidelity. Persons who
were granted land in fee simple (q.v.) were required to render liege homage to the granting nation.

**limites prorsi** - roads which ran parallel to the base line or decumanus maximus in the Roman centuriatio (Kish, 1962, p. 236).

**limites transversi** - roads which ran parallel to the cardo or principal meridian of the Roman centuriatio (Kish, 1962, p. 236).

**linearii** - see subruncivi.

**Marschhufendorf (pl. Marschhufendörfer)** - in Europe, the name given to settlements which developed in reclaimed marshlands. The individual parcel of land was a long lot which was laid out perpendicular to a road or canal. These lands were privately owned, not held in common. This was a possible antecedent of the arpent system in the New World, and had extensive distribution around the coasts of the North Sea. **Moorkolonie** is a similar, related form.

**marsh** - a low, wet, treeless, grassy area. The surface of a marsh may be firm or soft.

**meander (v.t.)** - to survey a meander line on or along a stream, lake, or swamp.

**mete (n.)** - a boundary or limit; a boundary stone or mark, especially in the phrase metes and bounds. (v.t.) To determine the dimensions or quantity of, to measure. To mark out the boundary of course of a line, especially when allotting property.

**metes and bounds** - the boundaries or limits of a tract of land, specifically the boundaries of land established by reference to natural or artificial monuments along it (as a stream, ditch, fence, or road), as distinguished from those established by beginning at a fixed point and running therefrom by stated compass courses and stated distances. In practice in Louisiana, irregular surveys of this sort were often run from point to point with compass and chain, using natural or artificial monuments, as above.

**moor** - an area of waste land overlaid with peat, usually more or less wet, and often covered to some extent with low shrubby heather and small tufted plants. The term **Heide** is of broadly similar usage in part of Lower Saxony in Germany.
nonius - named for Pedro Nuñez (Petrus Nonius), 1492-1577. A contrivance for the graduation of mathematical instruments, often used (inaccurately) for the vernier which is an improved form.

order of survey - an official document in Louisiana, authorizing the survey of a French or Spanish land grant, pursuant to establishing title to the land.

patent - an instrument making a conveyance of public lands; also, the land so conveyed.

perch, pole, rod - a unit of measure, in England and the United States, 5 1/2 yards or 16 1/2 feet linear measure. Variants of this measure were used in Germany, France, and Spain.

pita - the Spanish bayonet or dagger, a plant (Yucca aloifolia L.) with sharp-pointed leaves and a cluster of waxy white flowers on a tall spike. From Spanish pita, "century plant" (Read, 1963, p. 60).

plat (n. and v.t.) - a plan, map, or chart, especially of a property; also, to draw such a plan or map.

pole - see perch.

principal meridian - in the American rectangular survey, one of two major guide lines. The principal meridian theoretically intersected the base line at a right angle and was a true line of longitude. Range lines (q.v.) were surveyed at six-mile intervals east and west of the principal meridian.

proces verbal (pl. proces verbaux) - an authenticated minute or statement of an official act, here pertinent to granting public lands, for use as a basis for further action or for the acceptance of a superior. Settlers commonly accepted the proces verbal or the order of survey (q.v.) as patent to their lands. The term is generally accepted to mean records of survey.

protract (v.t.) - to draw out or prolong. In surveying, to lay down lines and angles; to plot.

quintarius (actuarus) - in the Roman centuriatio, every fifth line which separated centuriae. These lines bounded a saltus (Kish, 1962, pp. 235-236).

quitrent - a fixed rent, payable in lieu of certain feudal dues (for land tenure).
rancho (Span.) - a small ranch, a place where cattle or other livestock are reared.

range - in the United States public land system, a row or line of townships lying between two successive meridian lines (range lines) six miles apart. Due to the convergence of the meridians, range lines theoretically be true meridians and are commonly adjusted to correct for convergence at intervals of 24 miles.

requête ("ricket") - a request submitted in writing to the French and later Spanish authorities for a grant of land. The person making the request might ask for a particular amount and might specify the location. The early American version of this term was "ricket".

rigores - narrow lanes which separated individual holdings within a Roman centuria (Kish, 1962, p. 236).

rod - see perch.

royal rod - in measuring land in medieval Europe, the most common unit was the rod of 16 feet in German lands. The royal rod was generally considered to be five feet longer than the normal rod. Due to the variation of the length of the normal rod from as little as 10 feet to as much as 16 1/2 feet, the royal rod was also subject to considerable variation (Thompson, 1928, p. 509, n. 2).

saltus - a unit made up of 25 centuriae, 12,000 feet square. It was used in measuring the layout, size, and for the maintenance of roads in the Roman Empire (Kish, 1962, p. 234).

section - a square mile unit (640 acres) which makes up the major subdivisions into which the American rectangular surveys are divided. A township ordinarily contains 36 sections, but in those townships where irregular sections and arpent lots occur, the sections may number over 200.

sitio - literally, "a place." The term is here used to designate a square or rectangular league granted by the Spanish in the area west of the Mississippi in Louisiana. They were often oriented to the cardinal points of the compass.

subruncivi (linearii) - roads within a quintarius, in the Roman centuriatio system (Kish, 1962, p. 236).

swamp - a low, wet, forested area. In America, the term was
originally applied to a tract of rich soil having a growth of trees and other vegetation, but too moist for cultivation.

syndic - an officer of government. In Louisiana, a magistrate whose duty also involved inspecting Spanish land grants.

tabularium - the central archives in Rome where copies of surveyors' field notes (commentarii) and survey plats (forma) were filed (Kish, 1962, p. 240).

terrier - a book or roll in which the interests of private persons in lands are described by site, boundaries, acreage, etc. In fourteenth-century France, the term referred to a furrow.

theodolite - a portable surveying instrument originally used for measuring horizontal angles. It is a planisphere or horizontal graduated circular plate with an alidade or index bearing sights, subsequently elaborated with a telescope instead of sights, a compass, level, vernier micrometer, and other accessories.

toise - the French fathom consisting of six French feet, or 6 2/5 English feet.

township - as used here, a division of land in the American rectangular survey system, containing 36 sections of one square mile each. A township is exactly six miles square in theory.

vacherie - a place where livestock, primarily cattle, are reared. It is the French equivalent of the sitio (q.v.).

vara - a Spanish and Portuguese measure of length which varied in different localities from about 32 inches to about 43 inches. It is also a measure of area. The linear vara in Texas is 33.33 inches. It was never used in Louisiana.

Waldhufendorf (pl. Waldhufendorfer) - in Europe, the name given to settlements which developed in valleys in mountainous areas. The individual land parcel was a long lot, generally perpendicular to a road or valley axis. A possible antecedent of the arpent system in the New World, this type of settlement was found in the Black Forest, Erzgebirge, and similar areas of central Europe.
warrant - a document giving authority to survey property (see order of survey).

witness tree - a tree in a surveyed line or at or near a surveyed corner, which was used for the purpose of locating the line or corner. Information about the location was either carved or burned into the tree. A gnarled or stunted tree was selected wherever possible, as straighter trees were more likely to be cut down.
VITA

John Whitling Hall was born October 11, 1934, in Tulsa, Oklahoma. His elementary and secondary education was received in the public schools of Lafayette, Louisiana. He received a Bachelor of Science degree in geology from the University of Southwestern Louisiana in 1956, after which he entered the United States Army Security Agency (USASA). He served three years in Europe, and upon his release from active duty was employed by Century Geophysical Corporation in Colorado, Kansas, and Nebraska.

In 1960 Mr. Hall entered Southern Illinois University and received a Master of Arts degree in geography in 1963. From 1963 to 1966, he was Instructor of Geography at the University of Southwestern Louisiana. In the fall of 1966 he was admitted to the Graduate School of Louisiana State University to study cultural geography, and is a candidate for the degree of Doctor of Philosophy in geography at the winter commencement of 1970. Mr. Hall received a Graduate School Fellowship to carry out dissertation research, and is currently Assistant Professor of Geography at Louisiana State University in Shreveport. He is married to the former Carol Ann Hoffpauir. They have one child, Carla, born December 2, 1968.
Candidate:  John Whitling Hall

Major Field:  Geography

Title of Thesis:  Louisiana Survey Systems: Their Antecedents, Distribution, and Characteristics

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

January 9, 1970