1972

An Historical Geography of Industrial Cypress Lumbering in Louisiana. (Volumes I and II).

Ervin Mancil
Louisiana State University and Agricultural & Mechanical College

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The Louisiana State University and Agricultural and Mechanical College, Ph.D., 1972
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AN HISTORICAL GEOGRAPHY OF INDUSTRIAL CYPRESS
LUMBERING IN LOUISIANA

Volume I

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

Ervin Manoil
B.A., Southeastern Louisiana College, 1952
M.A., Louisiana State University, 1954
August, 1972
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ACKNOWLEDGMENT

This work would not have been possible without the aid and encouragement of many individuals. Special mention should be made of the contributions of Dr. Fred B. Kniffen, who initially directed the research, and Dr. Roland E. Chardon, who graciously took over where Dr. Kniffen left off and, with great patience and skill, edited this manuscript.

Gratitude is also expressed to my wife, Elizabeth, for her patience and understanding; to Mr. George W. Bedsole, who relieved this writer of many non-teaching duties during the period of writing; and to Mr. Donald L. Lea, Mr. Hymel G. Falgoust, and Mrs. Katheryn D. McWaters for their technical assistance. Also, special mention is due all those who so willingly gave of their time and first hand knowledge of cypress lumbering. Mr. E. James Koch, Sr., of Bowie Lumber Company, Mr. Norman Levenson, Mr. C. W. Witbeck, professional photographers, and Mr. Roland J. Treubig, forester, are due thanks for their assistance with photographs.
The major objective of this study is to record as much as possible of the imprints on the landscape resulting from cypress lumbering in Louisiana. If value accrues to this study, it is because no previous attempts have been made to bring together as many aspects as possible of cypress lumbering in this state. The literature is available to any researcher, but many of the informants—likely all of those with first-hand knowledge of the first years of industrial lumbering—cited in this work are now deceased, and with them went much information. This writer feels fortunate that they left some data with him. In these pages, then, is an attempt to record from literature and a few informants the botanical and habitat characteristics of cypress, and from a meager literature and many informants the historical geography of cypress lumbering.

Because large-scale industrial logging began for all major species in Louisiana at approximately the same time (about 1880 for pine, 1890 for cypress), this study will to some degree be applicable to lumbering in general in the state. However, since there are important differences in the habitat and characteristics of cypress as compared with other species, there were differences in lumbering techniques, resulting in landscape effects that
differed considerably from those produced by pine lumbering, the other major species exploited in Louisiana.

The major phases of the study are as follows:

1. the selection of the area of concentration;
2. the characteristics of cypress which restrict its distribution and thus determine the areas of lumbering operations;
3. the attempt to evaluate the future of cypress production and to determine the problems involved in forest regeneration;
4. the presentation of the elements and features of cypress lumbering in written, photographic, and cartographic forms.

The initial approach consisted of general reading of the ready sources in order to determine if a study of cypress lumbering would be of real significance. After this question was affirmatively answered, a more exhaustive investigation of written materials was undertaken. Such materials were inadequate to describe and explain the whole field of cypress lumbering and resultant changes. Four interviews of a preliminary nature were then scheduled in an attempt to determine if the changes of a cultural and physical nature suggested by the literature had actually occurred. The results of the interviews were regarded as confirmatory, whereupon a study of aerial photographs and topographic quadrangles was undertaken.
Patterns and evidences of cypress lumbering appearing on the photographs and maps were duly noted.

The evidence had now accumulated sufficiently to promise that the study might be productive. Armed with this knowledge and a checklist (Appendix A) of items of information desired, a number of trips were made in an attempt to locate and interview individuals who had been involved in various capacities in cypress lumbering. Notes were taken and topographic quadrangles used to record pertinent information. It might be noted at this point that much nonpertinent, but usually quite fascinating, information was obtained as well. It was somewhat of a surprise to find that almost everyone who had worked in cypress lumbering spoke nostalgically of the past, some even to the point of expressing longing for the bygone days. Most individuals seemed to have had a real fondness for the cypress lumbering days, and were glad to talk about them.

An extremely discouraging fact was that so many individuals who would have been very helpful were either dead or in such mental or physical condition that interviews were fruitless or impossible. Several informants died while the study was in progress. Also, records had all too frequently been destroyed or lost. The scarcity of individuals with intimate knowledge of the cypress period and the loss of records precluded any but the most general information on some townsites and areas of operation,
and left practically no firsthand information on cypress logging before the advent of the pullboat around 1891. On the other hand, quite detailed information was obtained in regard to some sites and areas. A passing observation might be: If only this study had been undertaken 25 or 30 years earlier!

Though the information gathered is more limited than might be wished, it is thereby true that greater value adheres to such as was obtained. The time is very near when firsthand informants will no longer be available, and with that, a certain "feel" or "sense" of the situation such as existed in cypress lumbering will disappear. Perhaps this study can help to fix that sense of understanding and be of value to others who are now or may become interested in the Louisiana swamps in terms of what happened to cypress. Also, it is hoped that the study will preserve the record of cypress lumbering and its lore, and interpret geographically some of the cultural and physical features associated with the activity.
TABLE OF CONTENTS

Volume I

Page

ACKNOWLEDGMENT ........................................ ii

PREFACE ................................................. iii

LIST OF FIGURES ...................................... x

LIST OF PLATES .......................................... xvi

ABSTRACT .............................................. xvii

Chapter

I. INTRODUCTION .................................. 1

II. CHARACTERISTICS AND BOTANICAL HISTORY
   OF CYPRESS .......................................... 15

Cypress' Botanical Nature
Scientific Classification
Common Names
Buttresses
Root Systems
Knees
Geological Age and Distribution
Commercial Stands
Size
Insects
Diseases
Habitat
Associates
Natural Reproduction and Regeneration
   Seeds and Seedlings
Conditions Requisite for Regeneration
Establishment in Water, Subsidence
   and Sea Level Changes
Dating by Annual Growth Rings
Competition and Edaphic Changes
Artificial Reforestation
Experimental Attempts
Nursery Seedling Production
Economic Feasibility and Obstacles
Properties and Uses of the Wood

vii
III. PREINDUSTRIAL EXPLOITATION

French Period
- Girdling and Floating of Cypress
- Logging with Animals
- Seasonal Nature of Cypress Logging
- Power for Saws—Hand Hewing
- Hand-powered Pit Sawing or Whipsawing
- Sash Saws
- Horsepower
- Waterpower
- Part-time Logging and Sawmilling
- Lumber Trade During the Pre-American Period

American Period
- Steam-powered mills
- Landscape Changes by Early Lumbermen
  - French and American

IV. INDUSTRIAL EXPLOITATION--THE SEQUENCE

General Considerations
Evolution of Logging Methods

V. INDUSTRIAL EXPLOITATION--THE OPERATIONS

- Girdling
- Floating
- Pullboat Logging Development and Operation
- Pullboat Logging
- Railroad Logging Development and Operation
- Railroad Logging
- Pullboat Versus Railroad Skidder
- Pullboat and Railroad Patterns
- Dike or Levee Float Logging

Volume II

VI. PHYSICAL AND CULTURAL CHANGES

Physical Changes
- Railroad Logging
- Pullboat Logging
- Float Logging
- Evaluation of Swamp Changes

Cultural Changes

People
- Newcomers to Louisiana
- Local Population Shifts
- Mill Towns
- Classification of Towns
- Mill Plants, Locations, and Elements
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII. THE CYPRESS WORKERS</td>
<td>206</td>
</tr>
<tr>
<td>Millmen</td>
<td></td>
</tr>
<tr>
<td>Amusement Facilities and Churches</td>
<td></td>
</tr>
<tr>
<td>Gardens</td>
<td></td>
</tr>
<tr>
<td>Public Service Facilities</td>
<td></td>
</tr>
<tr>
<td>The Woodsmen</td>
<td></td>
</tr>
<tr>
<td>Old-time Swamping</td>
<td></td>
</tr>
<tr>
<td>Swampers and Boats</td>
<td></td>
</tr>
<tr>
<td>Swampers' Health</td>
<td></td>
</tr>
<tr>
<td>Where Swampers Lived</td>
<td></td>
</tr>
<tr>
<td>Traversing Swamps</td>
<td></td>
</tr>
<tr>
<td>VIII. SUMMARY</td>
<td>244</td>
</tr>
<tr>
<td>SELECTED BIBLIOGRAPHY</td>
<td>261</td>
</tr>
<tr>
<td>APPENDIX</td>
<td>277</td>
</tr>
<tr>
<td>VITA</td>
<td>278</td>
</tr>
<tr>
<td>Figure</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>1. Aerial photograph of pullboat and railroad logging patterns</td>
<td>7</td>
</tr>
<tr>
<td>2. Plank roadway, mule, and dolly at Sorrento</td>
<td>10</td>
</tr>
<tr>
<td>3. Plank roadway and stacks of lumber at Bowie</td>
<td>11</td>
</tr>
<tr>
<td>4. Aerial photograph showing farmlands, hamlet and pullboat pattern</td>
<td>13</td>
</tr>
<tr>
<td>5. Buttress on a cypress</td>
<td>21</td>
</tr>
<tr>
<td>6. Bottle-butted cypress</td>
<td>22</td>
</tr>
<tr>
<td>7. Cypress knees</td>
<td>26</td>
</tr>
<tr>
<td>8. Giant cypress and large knee</td>
<td>27</td>
</tr>
<tr>
<td>9. Pit saw or whipsaw</td>
<td>66</td>
</tr>
<tr>
<td>10. Sash saw</td>
<td>67</td>
</tr>
<tr>
<td>11. Girdled cypresses</td>
<td>87</td>
</tr>
<tr>
<td>12. Three-drum pullboat being repaired</td>
<td>91</td>
</tr>
<tr>
<td>13. Sheave block</td>
<td>92</td>
</tr>
<tr>
<td>14. Schematic Diagram of a Pullboat</td>
<td>94</td>
</tr>
<tr>
<td>15. Sniped log</td>
<td>97</td>
</tr>
<tr>
<td>16. Pullboat outfit</td>
<td>98</td>
</tr>
<tr>
<td>17. Quarterboat and dredge boat</td>
<td>99</td>
</tr>
<tr>
<td>18. A two-drum pullboat</td>
<td>100</td>
</tr>
<tr>
<td>19. Pullboat and floating crane</td>
<td>101</td>
</tr>
<tr>
<td>20. Pullboat logging layout</td>
<td>102</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>21.</td>
<td>Blasting an obstruction</td>
</tr>
<tr>
<td>22.</td>
<td>Boring hole</td>
</tr>
<tr>
<td>23.</td>
<td>Log hitting the water</td>
</tr>
<tr>
<td>24.</td>
<td>Pullboat scene</td>
</tr>
<tr>
<td>25.</td>
<td>Dredging</td>
</tr>
<tr>
<td>26.</td>
<td>Scene on Blind River</td>
</tr>
<tr>
<td>27.</td>
<td>Arrangement of the lines on a skidder and loader</td>
</tr>
<tr>
<td>28.</td>
<td>Blocks and guy lines</td>
</tr>
<tr>
<td>29.</td>
<td>Skidder and loader</td>
</tr>
<tr>
<td>30.</td>
<td>Tail tree</td>
</tr>
<tr>
<td>31a.</td>
<td>Topping a spar tree</td>
</tr>
<tr>
<td>31b.</td>
<td>Topping a spar tree</td>
</tr>
<tr>
<td>32.</td>
<td>Skidder with steel boom</td>
</tr>
<tr>
<td>33.</td>
<td>Cleared right-of-way</td>
</tr>
<tr>
<td>34.</td>
<td>Cleared right-of-way</td>
</tr>
<tr>
<td>35.</td>
<td>Logging railroad scene</td>
</tr>
<tr>
<td>36.</td>
<td>Pile driver</td>
</tr>
<tr>
<td>37.</td>
<td>Railroad constructed on piling</td>
</tr>
<tr>
<td>38.</td>
<td>Cribwork roadbed</td>
</tr>
<tr>
<td>39.</td>
<td>Cribwork roadbed</td>
</tr>
<tr>
<td>40.</td>
<td>Cribwork roadbed</td>
</tr>
<tr>
<td>41.</td>
<td>Loading a dunnage car</td>
</tr>
<tr>
<td>42.</td>
<td>Dunnage being dumped</td>
</tr>
<tr>
<td>43.</td>
<td>Corduroy roadbed</td>
</tr>
<tr>
<td>44.</td>
<td>Skidder on a spur</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>45</td>
<td>Skidder-loader at work</td>
</tr>
<tr>
<td>46</td>
<td>Steel-towered skidder at work</td>
</tr>
<tr>
<td>47</td>
<td>Two-deck loader</td>
</tr>
<tr>
<td>48</td>
<td>Cars being pulled through loader</td>
</tr>
<tr>
<td>49</td>
<td>Aerial view of logs, railroad, loader and uncut forest</td>
</tr>
<tr>
<td>50</td>
<td>Swampers on tank car</td>
</tr>
<tr>
<td>51</td>
<td>Swampers on hand car</td>
</tr>
<tr>
<td>52</td>
<td>Dredge boat</td>
</tr>
<tr>
<td>53</td>
<td>Area logged by skidder</td>
</tr>
<tr>
<td>54</td>
<td>Levee float logging operation</td>
</tr>
<tr>
<td>55</td>
<td>Pumps flooding diked logging area</td>
</tr>
<tr>
<td>56</td>
<td>Photograph of a map</td>
</tr>
<tr>
<td>57</td>
<td>Fellers and pirogues</td>
</tr>
<tr>
<td>58</td>
<td>Felling tree with a chain saw</td>
</tr>
<tr>
<td>59</td>
<td>String of logs being towed</td>
</tr>
<tr>
<td>60</td>
<td>Log tow boat</td>
</tr>
<tr>
<td>61</td>
<td>Log storage area</td>
</tr>
<tr>
<td>62</td>
<td>Pondman at work</td>
</tr>
<tr>
<td>63</td>
<td>Loading crane with load of logs</td>
</tr>
<tr>
<td>64</td>
<td>View of log storage pond area</td>
</tr>
<tr>
<td>65</td>
<td>Shell road on old railroad bed</td>
</tr>
<tr>
<td>66</td>
<td>Old railroad bed in a sugarcane field</td>
</tr>
<tr>
<td>67</td>
<td>Old railroad bed off Airline Highway</td>
</tr>
<tr>
<td>68</td>
<td>Old railroad bed at Blind River</td>
</tr>
<tr>
<td>69</td>
<td>Old railroad bed at Timberton</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>70.</td>
<td>Dredge boat digging a canal</td>
</tr>
<tr>
<td>71.</td>
<td>Logging canal</td>
</tr>
<tr>
<td>72.</td>
<td>Logging canal serving as drainage canal</td>
</tr>
<tr>
<td>73.</td>
<td>Logging canal serving as drainage canal</td>
</tr>
<tr>
<td>74.</td>
<td>Canal at Sorrento</td>
</tr>
<tr>
<td>75.</td>
<td>St. James millsite</td>
</tr>
<tr>
<td>76.</td>
<td>Former office building at Rhoda</td>
</tr>
<tr>
<td>77.</td>
<td>Rhoda site</td>
</tr>
<tr>
<td>78.</td>
<td>Abandoned waterfront at Rhoda</td>
</tr>
<tr>
<td>79.</td>
<td>Dry kiln at Donner</td>
</tr>
<tr>
<td>80.</td>
<td>Donner millsite</td>
</tr>
<tr>
<td>81.</td>
<td>Chacahoula townsite</td>
</tr>
<tr>
<td>82.</td>
<td>Chacahoula millsite</td>
</tr>
<tr>
<td>83.</td>
<td>Bowie pond and sawmill</td>
</tr>
<tr>
<td>84.</td>
<td>Logs stored in Bayou Plaquemine</td>
</tr>
<tr>
<td>85.</td>
<td>Rafts of logs on Bayou Teche</td>
</tr>
<tr>
<td>86.</td>
<td>Remnants of a log storage boom on Bayou Plaquemine</td>
</tr>
<tr>
<td>87.</td>
<td>Aerial view of Garden City millsite</td>
</tr>
<tr>
<td>88.</td>
<td>Ponchatoula millsite</td>
</tr>
<tr>
<td>89.</td>
<td>Panoramic view of Bowie plant</td>
</tr>
<tr>
<td>90.</td>
<td>View of Bowie site</td>
</tr>
<tr>
<td>91.</td>
<td>View of Bowie site</td>
</tr>
<tr>
<td>92.</td>
<td>View of Bowie site</td>
</tr>
<tr>
<td>93.</td>
<td>View of Bowie site</td>
</tr>
<tr>
<td>94.</td>
<td>White Castle site</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>95.</td>
<td>White Castle site</td>
</tr>
<tr>
<td>96.</td>
<td>White Castle railroad bed</td>
</tr>
<tr>
<td>97.</td>
<td>Bowie Boilers</td>
</tr>
<tr>
<td>98.</td>
<td>House at Garyville</td>
</tr>
<tr>
<td>99.</td>
<td>Houses at Sorrento</td>
</tr>
<tr>
<td>100.</td>
<td>House at Lutcher</td>
</tr>
<tr>
<td>101.</td>
<td>House at Garden City</td>
</tr>
<tr>
<td>102.</td>
<td>Houses at Plaquemine</td>
</tr>
<tr>
<td>103.</td>
<td>Houses at Plaquemine</td>
</tr>
<tr>
<td>104.</td>
<td>House at Blanks</td>
</tr>
<tr>
<td>105.</td>
<td>House at Blanks</td>
</tr>
<tr>
<td>106.</td>
<td>Houses at Garden City</td>
</tr>
<tr>
<td>107a.</td>
<td>House at Garyville</td>
</tr>
<tr>
<td>107b.</td>
<td>House at Garyville</td>
</tr>
<tr>
<td>108.</td>
<td>House at Lutcher</td>
</tr>
<tr>
<td>109.</td>
<td>House at Ramos</td>
</tr>
<tr>
<td>110.</td>
<td>House at Garden City</td>
</tr>
<tr>
<td>111.</td>
<td>House at Garden City</td>
</tr>
<tr>
<td>112.</td>
<td>House at Garden City</td>
</tr>
<tr>
<td>113.</td>
<td>House at Garden City</td>
</tr>
<tr>
<td>114.</td>
<td>Former lumber company office building, Garden City</td>
</tr>
<tr>
<td>115a.</td>
<td>House at White Castle</td>
</tr>
<tr>
<td>115b.</td>
<td>House at White Castle</td>
</tr>
<tr>
<td>116.</td>
<td>Swamper's camp</td>
</tr>
<tr>
<td>117.</td>
<td>Springboard</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td>118.</td>
<td>Bench</td>
</tr>
<tr>
<td>119.</td>
<td>Tall stumps</td>
</tr>
<tr>
<td>120.</td>
<td>Skidder camp</td>
</tr>
</tbody>
</table>
### LIST OF PLATES

<table>
<thead>
<tr>
<th>Plate</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Major Vegetation Types</td>
<td>2</td>
</tr>
<tr>
<td>II. Geological Map</td>
<td>3</td>
</tr>
<tr>
<td>III. Areas of Industrial Cypress Logging</td>
<td>4</td>
</tr>
<tr>
<td>IV. Industrial Cypress Mill Towns</td>
<td>6</td>
</tr>
<tr>
<td>V. Range of Cypress</td>
<td>20</td>
</tr>
<tr>
<td>VI. Railroad Logging Sequence in Tangipahoa Parish</td>
<td>120</td>
</tr>
<tr>
<td>VII. Donner Site</td>
<td>187</td>
</tr>
<tr>
<td>VIII. Garden City</td>
<td>188</td>
</tr>
<tr>
<td>IX. Plat of Lutcher</td>
<td>189</td>
</tr>
</tbody>
</table>
ABSTRACT

Cypress in large-scale industrial quantities was found within the more poorly-drained areas of Louisiana's bottomlands. Within the swamps proper, there were few permanent inhabitants, while the higher lands within and surrounding the cypress regions, with few exceptions, were characterized by small settlements.

*Taxodium distichum*, with one variety, *mutans*, is the scientific classification of cypress, which is located within the southeastern United States. The tree is botanically distinctive, in part because of its size, long life, buttresses, and knees. It is attacked by few insects and diseases, but its reseeding characteristics along with a changing habitat have made natural regeneration of large stands unsuccessful. Artificial reforestation has been found to be economically unfeasible. Thus, the tree is gone forever in important commercial quantities.

The wood's highly desirable commercial qualities led to early local use and exportation, but because of its habitat and technical problems of logging and milling, production remained low until the late nineteenth century. At that time Northern timber resources were nearing depletion, and successful means of removing large quantities of logs from swamps were devised. These developments,
along with the previously solved problem of power for sawmills, ushered in the industrial cypress lumbering era, 1890 to 1925, which exhausted the large stands of virgin cypress.

The major industrial means of removing swamp trees were the pullboat and overhead railroad skidder, both of which resulted in changing swamps as well as producing sufficient logs for industrial milling. The consequences of these logging methods—the removing of all large stands of cypress, dredging of canals, and constructing of railroads in the swamps—wrought significant edaphic and biotic changes, which cannot be accurately evaluated at this time.

The industry's effects upon Louisiana's population and settlement patterns were not great. Local shifts in population and the slight influx of newcomers tended to be transitory. Almost all of the old towns that expanded with the industry shrank to their former sizes, while the new ones tended to disappear as the industry declined. Although the cultural reminders of the industry are few, work in the swamps and mills was hard, and wages low, cypress workers remember the era with nostalgia.

The cypress industry brought changes, but both the cultural and physical results are impossible to fully document at this late date. It is hoped that this admittedly incomplete work, but the only one extant, will be of value to those interested in Louisiana's swamps and the concomitant consequences of the cypress industrial lumbering era.
CHAPTER I

INTRODUCTION

Cypress in commercial quantities is found within the vegetational region usually identified as "bottom hardwoods and cypress," or as "oak-gum-cypress forests" (Plate I, after "Areas Characterized by the Major Vegetation Types, State of Louisiana," 1934). Geologically, the region of cypress forests coincides closely with the area of Recent alluvium lying north of the coastal marsh (Plate II, after Hough, 1959).

The problem of delineating the area for this study arose with the attempt to determine where industrial cypress lumbering had been concentrated. A decision was made to limit the region of study primarily to that of major commercial production, which came about after the development of pullboats and overhead railroad skidders as the major means of getting cypress logs out of the swamps. The industrial period began around 1890; Plate III indicates the extent of the above-mentioned modes of cypress logging, which was determined from topographic quadrangles and aerial photographs. In the area involved, other species associated with cypress were largely ignored by lumbermen until the cypress had been exhausted. Another indicator of the limits of
LOUISIANA
GENERALIZED
GEOLOGICAL MAP
- RECENT
- PLEISTOCENE TERRACES
- TERTIARY UPLANDS

ADAPTED FROM NOCH
large-scale cypress operations is the location of milling sites (Plate IV) where cypress was the only wood milled, or comprised a minimum of fifty per cent of the cut. This information was garnered through interviews.

The specific areas of pullboat and railroad operations were largely obtained by studying topographic quadrangles and aerial photographs. This was done for all major and some minor alluvial regions of Louisiana. Figure 1 shows the patterns of these two forms of logging as indicated on aerial photographs. Sedimentation has been rapid enough to obscure the patterns in portions of the Atchafalaya Basin; thus, mapping them was impossible. Perhaps cognizance of two points should be taken here. First, float, mule, and oxen logging occurred in the pre-industrial period along many large streams and lakes. Information on this early period is virtually nonexistent from either literature or informants, and any scars on the landscape, other than the removal of cypress, have been obliterated. Second, cypress grew and was logged in the bottomlands outside the region outlined in Plate III. As far as this writer could determine, no large mills or logging operations utilizing fifty per cent or more of cypress existed outside the delineated region with the exception of a scant two-year period in Winn Parish (McLaure, July 14, 1958, and J. W. Smith, August 18, 1958). Thus, the

References to interviewees are made by month, day, and year in order to distinguish these from other sources of information.
INDUSTRIAL CYPRESS MILL TOWNS

• PRE-EXISTENT TOWN
  1. LAKE CHARLES
  2. LAKE ARTHUR
  3. NEW IBERIA
  4. JEANERETTE
  5. FRANKLIN
  6. HOUMA
  7. NEW ORLEANS
  8. DES ALLEMANDS
  9. VACHERIE
  10. NAPOLEONVILLE
  11. WHITE CASTLE

• PRE-EXISTENT HAMLET
  12. MORGAN CITY
  13. HOUZA
  14. BORGNEMOUTH
  15. CENTERVILLE
  16. GIBSON
  17. LUDIVINE

• NEW TOWN
  18. BATON ROUGE
  19. MARINGOIN
  20. PONCHATOULA
  21. SPRINGFIELD
  22. POINCIANA
  23. HEAD OF ISLAND
  24. CRESCENT
  25. INDIAN VILLAGE
  26. NORTH
  27. LUTCHER
  28. TAFT
  29. ST. JAMES
  30. PONTCHARTRAIN
  31. PLATTENVILLE
  32. ORLEANS
  33. TIMBERON
  34. SPRINGFIELD
  35. SORRENO
  36. HEAD OF ISLAND
  37. CRESCENT
  38. INDIAN VILLAGE
  39. CRESCENT
  40. MORLEY
  41. ATLANTA
  42. BOWIE
  43. MELROSE
  44. STRADER
  45. RUDDOCK

• NEW TOWN, ABANDONED
  46. TAFT
  47. ST. JAMES
  48. BORGNEMOUTH
  49. PONCHATOULA
  50. SARRENTO
  51. HEAD OF ISLAND
  52. CRESCENT
  53. INDIAN VILLAGE
  54. BORGNEMOUTH
  55. PONCHATOULA
  56. SARRENTO
  57. HEAD OF ISLAND
  58. CRESCENT
  59. INDIAN VILLAGE
  60. BORGNEMOUTH
  61. PONCHATOULA
  62. SARRENTO
  63. HEAD OF ISLAND
  64. CRESCENT
  65. INDIAN VILLAGE

SCALE - MILES
0 10 20 30 40 50
Fig. 1. Logging patterns left by pullboat (left) and railroad (right). Note the "sets" (enlarged places on the canal) dredged for the anchoring of the pullboat and other floating equipment and facilities. Also, notice that the logging spurs are parallel to each other and evenly spaced along the main logging railroad. 1940.

Department of Geography and Anthropology, Louisiana State University
small and scattered areas of cypress cutting are not included in the study.

The names and locations of cypress lumber operators were obtained from articles in lumber journals, magazines and newspapers (see bibliography), from individuals, and from records of incorporation located in the office of the Secretary of State in Baton Rouge. Combining locations of industries with distribution of forest types, it was possible to outline the areas in which the logging and milling of cypress exclusively or as the overwhelmingly dominant species on an industrial basis occurred. It is quite likely that some inaccuracies exist on Plates III and IV, but it is believed that the distributions are essentially correct. It is quite unlikely that better information will ever be available.

The plates reveal that practically all industrial cypress lumbering occurred between a southern boundary of 29°30' north latitude and 30°30' north latitude to the north. On the west, Bayou Teche forms the boundary for the bulk of operations. Eastward, the Mississippi River as far south as Ascension Parish is roughly coincident with the boundary. In Ascension Parish the cypress area extends eastward from the Mississippi River to encompass lands along the northern shores of Lakes Maurepas and Pontchartrain. The absolute easternmost limit is reached at Madisonville, along the Tchefuncte River.

Small outliers of industrial cypress logging and milling show on Plates III and IV. Except in Calcasie
Parish, the present condition of forest growth in the outliers is such that it is likely to surprise the observer to know that cypress forests once existed. The forests were rather small in area, and little regeneration of any species of trees has occurred. Some areas are now marsh; others have been taken over by farms and pastures. The bottomlands along the Sabine and Calcasieu systems are exceptional in that bottom hardwoods exist there today.

The bulk of the study region is poorly drained bottomlands. Drainage improvements have occurred over large areas since the era of cypress lumbering began. Much of it is swamp—some areas never free of standing water except in periods of extreme drought. For example, in the summer of 1960, a drought year, a visit was made to the area north of Lac des Allemands in St. John the Baptist Parish. Informants said it was the first time since 1924 that the ground had been exposed in that particular area. Drainage conditions generally were such in the Louisiana cypress region that a few settlements established as mill towns had levees around them. Many sawmills used slightly elevated plank walks and roadways at the mill site (Figures 2 and 3).

In the cypress region are interspersed natural levees and ridges, some of which are large enough to have been converted to farmlands and townsites long before the advent of industrial cypress lumbering. This, then, is a mixed region in terms of both drainage and settlement patterns. Some
Fig. 2. Plank road at Sorrento, 1909-1921. The mule and dolly were used to move lumber to the drying yards and to railroad cars for shipping. Use of animals for such duties around mills was a common practice.

Josephine Devall

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^2When the date of a photograph cannot be approximated, the date of existence of the mill will be given.
Fig. 3. Plank road and stacks of lumber at Bowie, circa 1903-1904.

American Lumberman
areas, in the judgment of the inhabitants at least, are well-drained, high lands. A visitor might be inclined to refer to all the areas as swamp.  

Along the larger natural levees of the region were the long-established settlements and farms; these were the so-called "well-drained" lands, with their comparatively dense populations and established cultural patterns (Figure 4). The small (low and narrow) natural levees frequently contained line villages with knots here and there where a general store or trading center was located. Population was sparse and tended to be concentrated in scattered clumps on these ridges. In the swamps proper, few lived permanently. Here and there was a hermit, an isolated family group, or a trapper's shack.

In the entire region, dense settlements were to be found only along the major streams, such as in the Lake Charles area along the Calcasieu River, along Bayous Teche, Lafourche, Plaquemine, and Black, and the Mississippi River.

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An extreme example may be cited to illustrate the point that often what one thinks about drainage and elevation is conditioned by his knowledge and experiences. In the summer of 1959 an old-time swamper offered to take this writer into the Choctaw swamp of Lafourche Parish. He indicated on a map the general location of a ridge that was to be walked. The entire ridge turned out to be under 6 to 10 inches of water, and was exposed only during dry seasons. But, an underwater ridge it was, because to either side of it the water deepened rapidly to several more inches. It is doubtful that anyone traveling the swamp on foot would for long question the classification of the feature as a ridge.
Fig. 4. Aerial photograph showing farmlands and a hamlet on a natural levee in St. Mary Parish, 1940. Note the pullboat logging canals and sets.

Department of Geography and Anthropology, Louisiana State University
Into this region came industrial lumbering with concomitant cultural and physical changes that will be discussed in a later chapter.
CHAPTER II

CHARACTERISTICS AND BOTANICAL HISTORY OF CYPRRESS

Some scientific uncertainty marked efforts to place cypress properly in the plant world. The tree's peculiar uniqueness and its habitat, combined with the uncertainty regarding it, harasses modern botanists, foresters, lumbermen, and others who develop more than a passing interest in the tree. The uniqueness and scientific irresolution, however, do lend interest to the cypress.

**Cypress' Botanical Nature**

**Scientific Classification**

Cypress is of the genus *Taxodium*, and the wood so resembled that of the Old World cypress (genus *Cupressus*) that early Europeans gave it the same name. In fact, cypress was first classified as *Cupressus disticha* (Small, 1931:127). Small traces the development of the botanical history up to the writing of his article, at which time there were three recognized species: *Taxodium distichum*, *Taxodium ascendens*, and *Taxodium mucronatum* (Small, 1931:127). The latter species is found only in Mexico and, since it is not native to the United States, will not be of concern in this study.

The existence of three distinct species was questioned
by many authorities. This doubt was concerned with the two species found in the United States—*Taxodium distichum* and *Taxodium ascendens*. Kaeiser said that the two could not be distinguished on the basis of wood microstructure, and that this fact supported the theory, now quite widespread, that *Taxodium ascendens* was merely a variation of *Taxodium distichum*. Those who believed *Taxodium ascendens* to be a variety, referred to it as *Taxodium distichum*, variety *imbricarium* (1953:415-418). Clair A. Brown, Louisiana botanist, in discussing the species, said that he seriously doubted that there were two distinct species. This is supported by the fact that both imbricate and distichous leaves can be found on the same "... typical river bottom *Taxodium distichum*" (1945:28-29). Both in his 1945 writing and in an interview on February 12, 1964, Brown considered "... the Louisiana materials as ecological variants not worthy of specific rank."

At the time of this writing, pond cypress is usually referred to as *Taxodium distichum*, variety *nutans* (Betts, 1960:2). Regarding the uncertainty surrounding the botanical classification of cypress, the following quotation is of interest:

Pondcypress (*Taxodium distichum*, variety *nutans*), a variety of baldcypress, closely resembles baldcypress botanically and silvically. Typical specimens of each are readily identified by their leaf characteristics, but in the areas where both varieties occur, they intergrade to such an extent that it is often difficult and sometimes impossible to distinguish the two (Powells, 1965:675).

Perhaps scientific uncertainty of the classification of cypress has now been removed.
Whether or not it is scientifically accurate to do so, the common name bald cypress was given to *Taxodium distichum*, and pond cypress to *Taxodium ascendens*, or *Taxodium distichum*, variety *imbricarium*, now *Taxodium distichum*, variety *nutans*. However, bald cypress was usually said, or believed, to be an inhabitant of the deep coastal swamps, while pond cypress was associated with wetlands in the higher pinelands. It has been stated that the pond cypress, also called pond bald cypress, black cypress, and cypress, "is confined to the shallow ponds and wet areas of the Coastal Plain, and it generally does not grow in river and stream swamps" (Fowells, 1965:675-676). Also, pond cypress was the principal cypress found in the Atlantic states. Mattoon reported that *Taxodium distichum*, variety *imbricarium* "... is more abundant over the Atlantic Coast Plain than elsewhere" and indications are that it ". . . is undergoing a gradual botanic segregation during its assumed northward migration from Florida, and has been since the close of the glacial period" (1915:20).

Further, cypress, a conifer, is not evergreen. It sheds its branchlets, with leaves attached, in the cool season. The tamarack or larch (genus *Larix*) and the dawn redwood or water fir (*Metasequoia glyptostroboides*) are the only other conifers that are not evergreen ("Baldcypress *Taxodium distichum*", 1955:n.p.).

Also, cypress grows in association with certain
hardwoods, such as tupelo gum, swamp red maple, Drummond red maple, water ash, and pumpkin ash (Clair A. Brown, 1945:9). It was frequently logged along with the associated hardwoods, and was graded under the rules of both the National Hardwood Association and the Southern Cypress Manufacturers Association ("The Southern Hardwoods—Cypress," 1941:33).

**Common Names**

There are common names that indicate color and, to some degree, geographic origin of cypress timber. Names such as Gulf, Louisiana Red, Tidewater Red, Florida, Yellow, White, and Black Cypress were applied. "All refer to the same species (*Taxodium distichum*). The Forest Service recognizes only one other species, which they call Pond Cypress (*Taxodium ascendens*); but its infrequent occurrence and small size eliminate it from the commercial picture almost entirely" ("The Southern Hardwoods—Cypress," 1941:33). Other common names are Sea Cypress and Marsh Cypress. One brochure stated that "Tidewater Red Cypress (coast type) must not be confused with either Yellow Cypress or White Cypress (inland types), so it is important that you specify Arrow Brand Genuine Tidewater Red Cypress ("Tidewater Red Cypress--'The Wood Eternal'--As Old As The Ark, As Modern As Tomorrow," n.d., n.p.).

According to Campbell and Clark:

Originally red and yellow appear to have referred to the wood color prevalent in a region or locality. White and black were terms used by
loggers, at least along the Atlantic coast, to
denote logs that floated high (white cypress) and
logs that floated low or sank (black cypress).
However, along the gulf coast black referred to
color more than buoyancy (1960:1).

Numerous informants reported that upon occasion
cypresses of various colors were logged from the same
locality, with no apparent association with edaphic condi-
tions. Distribution will be discussed in a later section,
but perhaps it is noteworthy at this point to state that
it is impossible to separate bald cypress and pond cypress
geographically (Plate V). The various trade or commercial
names, scientific names, and conflicting reports on the
characteristics and features of cypress are quite confusing.
Many individuals have taken a firm position on these matters;
an argument is not difficult to evoke among many of the old-
time cypress lumbermen.

Buttresses

Some trees that grow under rather wet conditions
have a tendency toward the development of buttresses, or
swollen butts (Figures 5 and 6). It is reported by Platt
(1965:192) that the buttresses are developed to help buoy
trees that grow in soft areas. This is an improbable reason
for their development. Platt also reported that cypresses
carried downstream often lodge against sandbars and, when
the water rises again, they came upright due to the weight
of the swollen butt, and put out leaves (1965:192). Buttress
development on cypresses growing in water has been the source
Fig. 5. Buttress on a cypress in a deep swamp. St. Martin Parish, 1928.

United States Forest Service
Courtesy Louisiana Forestry Commission
Fig. 6. Bottle-butted cypress, Atchafalaya Basin, circa 1940.

Department of Geography and Anthropology, Louisiana State University
of much discussion and some investigation. Ideas regarding them are hereinafter summarized. Kurz and Demaree wrote that buttresses, and the particular shapes taken by them, are:

A response to the simultaneous presence of water and air (presumably oxygen) .... It would seem therefore that the form of any particular buttress will depend upon the frequency as well as the duration with which its various horizons are subjected at once to water and air (1934:38).

These authors' most conclusive evidence was that bell-shaped buttresses developed on cypress trees after the creation of Reelfoot Lake in Tennessee in 1811 and 1812. A severe drought occurred in 1929 and 1930, and the water level of Reelfoot Lake dropped considerably.

The survivors of the earthquake now unmasked presented an amazing sight. Contrary to all expectations, their buttresses did not extend to the lake floor, but terminated abruptly just below the usual water level (1934:38).

Information collected on football-shaped swellings on cypress trees in Lake Chicot, Louisiana, suggests that they are a result of aeration and water (Penfound, 1952:420). The air-plus-water theory has not been challenged.

But why buttresses?\(^1\) The scientific answer to this is still uncertain, which has led some writers into the realm of speculation, which probably is best expressed in the following:

With roots groping in unstable, virtually

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\(^1\)Richards (1964:59-74) discusses buttress development on some species of trees in tropical rainforests and Switzerland. Botanists and foresters interested in the subject will find Richards' work of value.
bottomless mud how can a tree erect a trunk a hundred or more feet in the air? Bald cypress wood is so heavy that a freshly cut log sinks in water. It would seem that the least sway of its ponderous column would easily rip its roots from the unstable mud and send it toppling. But Taxodium has achieved an outstanding feat of engineering. The base of the trunk flares out at the surface of the water. Where drought or drainage has lowered the water level of a cypress swamp, the bulbous base is seen to continue widening four or five feet below the surface. Bald cypress has the shape of a giant bottle with a long neck. This form tends to keep it in a vertical position, in the manner of a toy clown, weighted so that it cannot be tipped over (Platt, 1965:192).

Root Systems

No extensive discussion of the characteristics of the root system of cypress is found in writings other than that of Mattoon. He said that the conical base of the tree "... divides below the surface into six to ten strong descending and spreading roots, which provide a deep anchorage for the tree. The form suggests that of a mushroom anchor" (1915:25-26). Besides the descending roots, there are several lateral roots that spread and branch widely. The result of the two systems is that the tree is strongly rooted, which is a necessity in the soft, wet soil in which it is usually found. If cypresses were not strongly rooted, they could be easily blown over by strong winds. The deep, strong, and extensive root systems are further emphasized by Mattoon's statement that they "... have proved such an expensive obstacle to the digging of canals through swamps as to cause the financial failure of numerous timber operations
dependent upon this form of logging" (1915:26).

**Knees**

The root feature that has caused most discussion is the knee, which is a protuberance or upright portion of the lateral roots (Figures 7 and 8). Most knees are cone shaped, but many are elongate in form. Cypress knees are distinctive developments; their function or purpose has been the subject of much discussion. It seems that a late eighteenth-century writer had knees in mind when he wrote about cypress:

> It renews itself in a very extraordinary manner: a short time after it is cut down, a shoot is observed to grow from one of its roots exactly in the form of a sugar-loaf, and this sometimes rises ten feet high before any leaf appears: the branches at length arises from the head of this concical shoot (Le Page du Pratz, 1947:217).

Certainly many have thought the cypress knee to be a tree, and may have arrived at this conclusion because seeds have been known to sprout and grow for some time in the hollows on the tips of decaying knees (Mattoon, 1915:27). Cypress stumps frequently produce sprouts, so that careless observation may have been responsible for the idea that knees are young trees.

Numerous other functions have been ascribed to cypress knees. Aeration and anchorage devices seem to have been the most popular suggestions. Best and most numerous development of knees occurs where the ground is soft and is alternately exposed and covered by water. Knee heights
Fig. 7. Cypress knees. Date unknown.

Stanley P. Horn
Fig. 8. Giant cypress and large knee (lower right), *circa* 1903-1904.

Department of Geography and Anthropology, Louisiana State University
vary considerably, even in the same locality, but their height will rather accurately indicate average high-water level. Some knees reach heights of eight to ten feet above low-water mark (Mattoon, 1915:26). Mattoon's ideas, which were commonly held at the time, would seem to justify both aeration and anchorage theories. But one question in particular bothered many botanists: Why do cypress trees in deep water lack knees?

Literature on the subject, with one exception, ignored anchorage, dealt with aeration. This is logical because aeration functions would be easier to test than anchorage. But, it was extremely difficult to believe knees were aerating structures because of their absence on trees growing in deep water, by which was meant, permanent lakes or deep swamps (Kurz and Demaree, 1934:40).

Carefully conducted experiments cast further doubt on the aeration theory. Kramer, Riley, and Bannister cited an unpublished manuscript of the United States Forest Service reporting that experimental removal of knees had little effect upon the growth of trees. These authors, after experimentation, concluded that "... it seems probable that most of the oxygen absorbed by cypress knees is used by the meristematic tissue of the knees," and "It certainly is not necessary to assume that any appreciable gas movements occurs from the knees in the experiments" (1952:120). Kramer, Riley, and Bannister believed with Kurz and Demaree (1934:}
40) that knees are a response to the interaction between water and air.

A later idea is that cypress knees may be oxygenating organs. There is a layer of chlorophyll in the cortex of knees, and indications "... are that the layer functions photosynthetically" (Wagner, 1963:29, 31). Oxygen is a product of photosynthesis; thus, the knees do not absorb oxygen from the atmosphere. The evidence then, is against cypress knees' acting as aerators for the roots, which is logical because the knees develop on the upper roots and not on the deep or lower ones which need the oxygen most (Platt, 1965:193).

However, Platt postulated a modified aeration function for cypress knees. He theorized that cypress needs dormancy by halting respiration. The willow, he believed suggests the function of cypress knees.

. . . . recent experiments show that willow takes in oxygen through its twig tips and delivers it to root tips in drowned soil. This internal oxygen supply is limited, but sufficient for meagre root growing and to keep the root hairs of an established system operating (1965:193-194).

These root hairs (roots primordia), growing near the base of the trunk, need sunlight, and dormancy is necessary for roots to develop trunkwood.

Until science produces evidence to the contrary, we can suppose that bald cypresses have an internal oxygen delivering system . . .

and that cypress knees

are dispatching root-growing enzymes down to
their roots in the black silt—but only when
bald cypresses are dormant with all their
needles off (1965:194).

Another idea is that cypress knees are strengthening
features. In discussing this, Clair A. Brown said:

Some knees occur just above the place where a
horizontal root starts downward, and this is
cited as strengthening the root at this place.
However, many knees do not occur in such a place
and thus this explanation does not apply to them
(1951:38).

After questioning the idea that knees are oxygen-absorbing
structures, Dr. Brown concluded: "The function of the knees
needs careful study" (1951:38). Here the question of cy-
press knees lies, or perhaps, protrudes.²

Besides these unanswered questions, there is the
additional one of cypress knees, though they are small and
not numerous, appearing in places where flooding never occurs.
At this point, perhaps the question can be asked: Is it
necessary for cypress knees to have a function? Taxodium
is geologically old, and the knee may be purely vestigial.

Whether functional or vestigial, cypress knees do
have a minor economical place. In the Southeast, there is
a market for polished cypress knees. Tourists seem to be
the most frequent buyers. Wagner reported that he saw
knees, imported from somewhere in the southeastern portion

²The work of Richards (1964:74-76) on tropical
rainforests contains information on the development and
function of knees and pneumatophores that is likely to be
valuable to the student pursuing this subject.
of the United States, for sale on the Oregon Coast (1963:29). The business is small and of little economic significance.

Geological Age and Distribution

Taxodium was quite abundant, forming extensive forests throughout the world, in the Miocene Epoch (Harlow and Harrar, 1941:187). Mattoon pointed out that cypress was forced southward from arctic regions of both North America and Europe by the glacial advance (1915:19). Small added Asia to the list of continents having the tree, and wrote that fossil remains indicate that cypress was "... widely scattered in north temperate and arctic regions in the Tertiary period" and mentions the finding of specimens on Spitzbergen (1931:127).^3

In prehistoric times Taxodium had a much greater range and was more abundant than in later periods. At present, the tree is restricted to the North American continent. Plate V (after Fowells, 1965:672) shows the distribution within the United States. Cypress is found along the Atlantic Coast Plain south of Delaware and New Jersey, and along the Gulf Coast into Texas. From the Gulf of Mexico the tree extends up the Mississippi Valley to southern Illinois and Indiana. It has been planted outside this region, to endure temperatures of -20°F (Cheyney, 1942:436). An interesting point is that "90 cer cent of the cypress is within an

^3The southernmost point of Spitzbergen is approximately ten degrees above the Arctic Circle.
elevation of 100 ft. above sea level; in the Mississippi Valley 500 ft. is the limit, and in western Texas 1,000 to 1,750 ft." (Harlow and Harrar, 1941:202).

The finding of buried cypress forests estimated to be 100,000 years old at Washington, D.C. (Neubrech, 1939:3) and Philadelphia ("Buried Cypress Forest Unearthed," 1939:38) and 1,000,000 years old in Maryland (Horn, 1943:119) is frequently cited to indicate former greater distribution, antiquity, and the durability of the tree. Locally, ditch diggers found a buried, upright cypress tree near Maringouin, Louisiana (Puneky, 1952:4). No age was cited for this tree.

**Commercial Stands**

Commercial stands of cypress were restricted to Florida and the southern Mississippi Valley, according to Cheyney (1942:436). Neubrech said that "The heaviest stands are found in Florida, Louisiana, the lower Mississippi Valley, and to a lesser extent in South Carolina and Georgia . . ." (1939:3). It is most difficult, if not entirely impossible, to establish accurate definitions for "commercial" and "heavy" stands. Thus, some disagreement is to be expected. However, other writers agree in general with Cheyney and Neubrech. Certainly, outside the swamplands of the coastal areas, cypress was logged only in conjunction with associated species in the industrial era.

Discussions of the distribution of cypress emphasize bald cypress. Pond cypress is mentioned merely as being
more limited in range. Plate V shows the distribution of bald cypress; no map was found that showed the distribution of pond cypress separately, and only two (Betts, 1960:3; Fowells, 1965:672)\(^4\) show it in conjunction with bald cypress. From discussions of the distribution of cypress, it seems that pond cypress is found within the boundaries outlined for bald cypress. Harlow and Harrar (1941:201), Small (1931:131), and Fowells (1965:675-676) agreed that pond cypress is less widely distributed, and that it ranges from southern Virginia to Florida, and then westward to Louisiana on the Coast Plain.

One informed writer stated that "Commercial cypress lumber is produced almost entirely from one species only, *Taxodium distichum*" (Nelson C. Brown, 1934:200). From information obtained from literature and informants, it does appear that the cypress lumber industry was based in the main upon trees that grew under conditions producing bald cypress. Whether bald cypress is a distinct species, or under certain conditions produces an ecological variant known as pond cypress, affects in no way the facts regarding the areas of greatest production. No definite boundaries were, or could ever be, drawn separating bald cypress and pond cypress. However, because of the grading rules of the National

\(^4\)These maps appear to be identical and both are in United States Department of Agriculture, Forest Service publications. Thus, it is likely that they have a common origin.
Hardwood Lumber Association and the Southern Cypress Manufacturers' Association, distinction between the two was pretty much left to the discretion of the lumber graders and the trustworthiness of the lumber manufacturers.

Literature reveals only two attempts to establish boundaries. The first was by the Office of Price Administration. This was done in order to establish ceiling prices for both cypresses during World War II. It was decreed that tidewater red cypress (coast type, or bald cypress) was produced within seventy-five miles of the Atlantic and Gulf coasts. Inland from that line, yellow or white cypress (inland type, or pond, cypress) was produced. However, in its ruling, the Office of Price Administration permitted producers inland from the seventy-five mile limit "... to prove that in the past their lumber has been accepted by their buyers as 'tidewater red'" (Horn, 1943:115). Thus did a bureaucracy solve a problem that had long troubled experts in the field!

The second attempt to show the limits of pond cypress appears in United States Department of Agriculture, Forest Service publications (Betts, 1960:3; Fowells, 1965:672). These maps show the northern or inland limit of pond cypress, but no southern or seaward limit (Plate V). Both maps and Fowells's written material (1965:675-676) indicate that bald cypress extends much farther northward than pond cypress. This, of course, directly contradicts the ruling of
the Office of Price Administration. The contradiction between the two is indicative of the uncertainty regarding cypress.

Size

As in all other respects, most of the discussion of size, age, and longevity deals with bald cypress. Very little information is available on pond cypress. Bald cypress is a large tree, normally attaining a height of 100 to 120 feet, and diameter of 3 to 5 feet at maturity. The maximum size, according to Harlow and Harrar (1941:198), is a height of 150 feet and a diameter of 17 feet. Pond cypress is smaller, with mature trees reaching a height of 70 to 80 feet (Dallimore and Jackson, 1948:605). No figures on the diameter of the latter tree were found.

Some authors' statistics vary slightly from those given above, but the general range is about the same. All agree that the bald cypress was the South's largest tree. A section of a large specimen was for some time displayed in the Louisiana State Capitol Agricultural Museum at Baton Rouge. The tree was 115 feet high, with a butt diameter of 90 inches. At 80 feet above the butt, the narrow diameter was 40 inches. "Foresters say this was probably the biggest tree east of California . . . ." ("Part of 1,200-Year-Old Tree Felled in Livingston Parish, Given Agricultural Museum," 1931:22).

According to several informants, the 90-inch tree
was no record holder. Many mentioned cypress logs too large in diameter to go through 9-foot band saws. Occasionally, these extremely large logs were split so that they could then be milled. Splitting was usually accomplished with dynamite, which was dangerous to men, the milling plant, and equipment. As a result, these giants were frequently abandoned.

Bald cypress is a long-lived tree. The maximum age is unknown, but is generally considered to be well over 1,000 years. A Florida tree, known as the "Sovereign Cypress," was estimated to be over 3,000 years old (Harlow and Harrar, 1941:201).

The section in the Agricultural Museum mentioned above is from a tree 1,283 years old ("Part of 1,200-Year-Old Tree Felled in Livingston Parish, Given Agricultural Museum," 1931:22). According to one author, another Louisiana cypress tree was older. This was the so-called "Edenborn Cypress," which was dead when cut from Coochie Brake in Winn Parish (Sonderegger, 1931:201). No age was cited for the "Edenborn Cypress." One informant (Lindsay, Claude H., May 4, 1956) stated that the average age of the cypress cut by the Louisiana Cypress Lumber Company, Inc., of Ponchatoula was 2,400 years. This informant found what he considered to be the parent trees, about fifty in number, of the forest that was cut by the Louisiana Cypress Lumber Company, Inc. An annual-growth ring count of one of these
trees revealed the age to be 3,960 years.

It is very likely that errors have been made in attempts to determine the age of cypress through the counting of annual-growth rings. Beaufait and Nelson stated that second-growth bald cypress seem to have false growth rings. These investigators checked plantation cypress of known age growing under varying edaphic conditions. "Yet even when obviously doubtful rings were omitted, the unaided eye counted an average of 28 rings for 17-year-old trees, 30 for 19-year-old trees, and 32 for 20-year-old trees. Within each age group, the larger trees had more apparent rings" (1957:588).

Results of tests on second-growth cypress have cast doubt on use of rings to determine the age and growth rates of cypress. The general feeling among several foresters interviewed seemed to be that cypress is a long-lived tree, but that the tree probably grows more rapidly than formerly believed, and does not reach the age once thought.

**Insects**

Cypress, compared to many other commercial species of trees, is relatively free of attack from insects and diseases. Most insects that infest cypress are found in weakened or recently felled trees. In healthy stands, apparently the only insects that have caused considerable damage are the cypress leaf beetle (*Systena marginalis*), and bald cypress looper (*Anacamptodes pergracilis*). Much discoloration of cypress foliage that had been ascribed to
summer drought may have been caused by the cypress leaf beetle. This insect eats holes in the leaves of cypress and, if enough holes are created, growth of the tree is probably retarded (Smith, 1954:21). Apparently of minor importance, red spider mites (Tetranychus spp.) have been reported north of, but not within, the region of industrial cypress lumbering. These insects cause reddening of cypress foliage and partial defoliation. Extent of damage is unknown (Putnam, Furnival, and McKnight, 1960:19).

Felled trees left in the woods too long were frequently attacked by pinhole borers, or ambrosia beetles (Mattoon, 1915:12, and Gunter, 1958:33). There are several groups of the foregoing; one of the most common is the flat-footed ambrosia beetle (Platypus compositus) (Gunter, 1958:33). Other borers causing damage were the cypress bark borer (Physocnpemum andreae) and flatheaded bald cypress heartwood borer (Trachvkele lecontei) (Fowells, 1956:675).

The relative freedom of cypress from insect attack is pointed up by the fact that the six insects cited above were the only ones mentioned in the descriptive literature, and one of these (the red spider mite) (Putnam, Furnival, and McKnight, 1960:19) was not found in the industrial region.

Diseases

Most trees are plagued by diseases of various kinds, but here again, cypress is comparatively free from attack. Various fungi attack trees, but cypress is said to be resis-
tant to them, although, as indicated below, Taxodium does not have total resistance. Cypresene, an oil, is believed to give cypress its great resistance. Campbell and Clark said, "... there probably are other fungus-inhibiting chemicals in the wood" (1960:1). At any rate, only one fungus, Stereum Taxodii, causes serious damage. This fungus results in a condition known as "peckiness" or "pegginess." Frequently, the damage is extensive, as indicated by one author who wrote "It has been stated that at least one-third of the standing cypress is affected ..." (Bryant, 1923:12). "Pecky" or "peggy" cypress is a result of the action of the fungus that enters the heartwood of living trees, especially those that are overmature ("Baldcypress Taxodium distichum," n.p.). Stereum Taxodii leaves holes in the heartwood from one-fourth to one inch wide, and often several inches long. When the tree is cut, decay stops. Durability of the wood is unaffected by the fungus (Betts, 1945:3). However, the wood is weakened structurally.

Peckiness occurs without any apparent regularity in cypress forests. Informants spoke of individuals who could look at a tree and determine whether or nor it was pecky. However, according to most informants, there are no obvious indications of either the absence or presence of peckiness.

Prior to the findings regarding Stereum Taxodii, another species of fungus, Daedalia, was generally considered to cause peckiness.
Literature on the subject does not indicate whether or not there are external indicators of *Stereum Taxodii* infection.

Mention should be made of Spanish moss (*Tillandsia usneoides*) which is commonly associated with cypress. The expression, or something similar to, "moss-draped cypress trees" occurs frequently in popular writings. Dense growths of Spanish moss in cypress swamps are common. Spanish moss needs support, humidity, and light for best growth, conditions met by cypress trees growing in abundance in many swamps. Here, cypress trees were available as supports, and the swamps furnished the required moisture. Then, too, the foliage of cypress is rather feathery in nature, and lets much sunlight through for the Spanish moss. Thus, optimum conditions for the needs of Spanish moss result in profuse growth. Because dense growths are most apparent on dead cypress trees, Spanish moss is sometimes incorrectly thought to be destructively parasitic ("Baldcypress *Taxodium Distichum* 7," 1955:n.p.). However, if the growth is dense enough, Spanish moss causes damage by reducing the light on the foliage and when wet, often is heavy enough to break limbs.

**Habitat**

Highly restrictive environments govern the distribution of cypress, especially the commercial stands. This has been of academic interest to botanists, foresters, and plant ecologists, and presently is of practical concern in
planning the utilization of cutover swamplands in terms of forest management and regeneration. Scientists in the several fields concerned readily admit that too little is known of the edaphic conditions controlling cypress. Such reasonably certain information as is available is summarized below.

Large stands of cypress were largely restricted to the wetter lands of alluvial floodplains and deltas of Recent formation (Plates I and II). These areas were characterized by abandoned stream channels, backswamps, and lakes, with interspersed levees and levee slopes. The sites of commercial stands of cypress were subject to annual overflow. Wetness, whether intermittent or more or less permanent, and youthfulness of terrain characterized cypress habitats.

Within the first and second bottoms, where the most dense stands of cypress were located, water and soil acidity and soil texture varied considerably. Water ranged from fresh to brakish. The cypress did quite well on muck, heavy-clay, sandy, and peaty soils (Cheyney, 1942:437). Though bald cypress was rarely found on such soils, best growth was achieved on deep, fine, sandy loams that had good water supplies in the surface layers, but with fairly good surface drainage (Marlow and Harrar, 1941:199-200). With regard to Louisiana, it was said that pond cypress is "... on acid soils whereas the baldcypress is on neutral to alkaline river bottom soils" (Clair H. Brown, 1945:28).

A typical Louisiana cypress swamp has been described
as a depression with a shallow margin and deeper interior. The swamp floor is ". . . uneven and consists of a series of depressions and small irregular elevations." In winter, the ground is ". . . usually covered with several feet of water . . . " (Clair A. Brown, 1951:37). The deeper portions usually contain water year-round. However, in extremely dry years, some of the normally water-covered swamps may dry up.

The habitat of the pure or relatively pure cypress stand is everywhere a watery one. In all cases, the surface was covered by water part or all of the year. As will be discussed in a later section, the watery habitat was the only place where cypress could reproduce naturally, yet at the same time the tree seems to have been doomed by this habitat.

**Associates**

As indicated previously, certain hardwoods grew in the same areas as cypress. Maps and written sources usually indicate this fact by the names given the forest types in which cypress was an important component. "Oak-gum-cypress," "bottom(land) hardwoods and cypress," and "tupelo-cypress" were some of the terms given this plant community. As a rule, the trees were in even-aged stands, with cypress overtopping the other species (Cheyney, 1942:437).

Cypress was most numerous in the deep swamps and the fertile buckshot soils of low, wet flats and deep sloughs. In these localities, tupelo gum (*Nyssa aquatica*) was the most
common associate. In fact,

Tupelo is frequently more abundant than cypress in heavily cutover stands... Pure stands of one species or the other prevail in some sections of the Delta. In the swamps around Lake Maurepas and Lake Pontchartrain in Louisiana, swamp blackgum is a component of the type (Sternitzke and Putnam, 1956:3).

Generally, water locust (Gleditsia aquatica), American elm or water elm (Ulmus Americana), planer tree (Planera aquatica), tupelo gum, swamp red maple (Acer rubrum), Drummond red maple (Acer drummondii), water ash (Fraxinus pennsylvanica), pumpkin ash (Fraxinus profunda), red bay or swamp privet (Forestiera acuminata), Virginia willow (Itea virginica), and buttonbush (Cephalanthus occidentalis) are the common associates of cypress (Clair A. Brown, 1945:9; Putnam, Furnival, and McKnight, 1960:6, 11).

On low, newly formed land, willow (Salix nigra) is usually the first tree to develop. However, willow tends to be succeeded by other species. If the site remains a swamp, the succession is as follows:

baldcypress, tupelogum, and green ash, sometimes in association with American elm, red maple, and sugarberry and persimmon. If sedimentation is

6"Delta" is a term used to indicate the forest type or forest survey region as determined by foresters. The entire Delta as used by foresters refers to hardwood and cypress areas located along the Mississippi and Atchafalaya floodplains, including all of the Gulf coastal parishes of Louisiana except St. Tammany.

7Nyssa sylvatica, var. biflora.

8Celtus laevigata. 9Diospyros virginiana.
pronounced, the site may eventually approach the status of a low flat and support much *Quercus nuttallii* or, in the Southeast, laurel oak *Quercus laurifolia* (Putnam, Furnival and McKnight, 1960:6-7).

The trees inhabiting the bottomlands and the order of succession will vary with soils and drainage conditions. Clair A. Brown, in speaking of the bottomland hardwood and cypress area, said:

Drainage is a very important feature in determining the forest types in any given area. In fact, a difference of a few inches in elevation here is often more important than a hundred feet in a mountainous country (1945:8-9). The oak-gum-cypress regions are extremely complex in terms of forest types. It is very difficult, if not altogether impossible, to generalize about sites and the trees that grow thereon. So many variables are involved that two or more apparently identical sites may show a good deal of difference in their tree communities.

Commercially and numerically, tupelo gum, green ash, pumpkin ash, swamp red maple, and Drummond red maple are the most important associates of cypress.

**Natural Reproduction and Regeneration**

**Seeds and Seedlings**

Cypress seeds are produced in a cone, or ball, with seed production normally beginning when trees reach an age of approximately 25 years. Normally, the seeds mature in

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10 *Quercus nuttallii*.

11 *Quercus laurifolia*. 
the autumn and fall to the ground in November and December. Should the seeds be released from the cones while the latter remain on the tree, their weight is too great to be carried far by winds. The seeds are supposedly distasteful to animals, and thus, not distributed by them. Being heavy and distasteful to animals, cypress seeds depend upon water to float them to likely spots for germination (Cheyney, 1942:437-438).

Floated seeds lodge against the higher spots in the swamps and on swamp edges, or simply dropped on the swamp floor by receding waters (Clair A. Brown, 1951:37). The seeds must remain soaked for about three months before germination occurs. Should the seeds become covered by muck, they will remain viable for as long as three years (Putnam, August 11, 1960). Good seed crops are produced at intervals of three to five years (Cheyney, 1942:437). Should a good seed crop be produced, floodwaters occur to float the seeds to high spots, and the soil remain wet enough to cause germination, then a new crop of seedlings will develop.

However, the young seedlings frequently face an uncertain future because cypress usually grows in places subject to overflow; the growing young plants may be

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12This writer frequently has seen cypress cones and seeds that were cut by squirrels. These may have been anomalies, but the frequency of occurrence makes this doubtful.
covered and drowned. Experiments conducted in Arkansas and Tennessee indicated that active seedlings 8 to 12 inches in height die within 10 to 12 days when submerged (Demaree, 1932:260). However, the dormant plant is apparently not harmed by submergence. The seedlings will remain dormant well into the growing season, resuming growth when water levels drop. "A few days of submergence is relatively harmless, costing only proportional growth . . ." (Putnam, 1963:14). Submergence after foliation is potentially fatal.

**Conditions Requisite for Regeneration**

The principal conditions requisite for cypress regeneration are as follows (Putnam, 1963:10-12):

1. A good source of seeds. In some instances, clear-cutting and/or logging techniques eliminated trees, and thus, seed production.

2. Freedom from competition, both on the ground for young seedlings and overhead for older seedlings, is necessary.

3. It is essential that excessive browsing and barking by animals do not occur.

4. Absence of fires is necessary. Fires are serious threats when swamps are dry, even though this condition occurs infrequently.

5. A suitable water regime must occur.
Should the conditions enumerated be favorable, natural regeneration of cypress can occur. The nature of the tree and sites ordains a rather haphazard natural regeneration of forests. The very fact that the tree is so exacting in the requisites for natural reforestation, and that they occur only at intervals, accounts for most cypress forests' occurring in even-aged stands.

**Establishment in Water, Subsidence and Sea Level Changes**

A recurring question asks how cypress stands become established in deep swamps and brackish areas. In places where the water is too deep for the establishment of cypress at present, it can only be assumed that the trees invaded during a long drought period or that the normal swamp water level has changed due to physical and/or human activities. There has been subsidence in places, which, coupled with a rise in sea level, has brought about inundation (McIntire, 1958:24-28; Saucier, 1963:12-16). An average subsidence rate of 0.78 feet per century has been ascertained for southeastern Louisiana. "This figure also includes an estimated 0.32 feet per century value for true sea level rise occurring at the present time . . ." (Saucier, 1963:13).

**Dating by Annual Growth Rings**

Because of inaccuracies in the dating of cypress by annual-growth rings, it is not possible to correlate
changes in elevation with the age of the tree. For example, using the 0.78 feet per century subsidence rate and the average age of 2,400 years for the trees cut by the Louisiana Cypress Lumber Company, Inc., in the area to the north of Lake Maurepas and Pass Manchac (Claude H. Lindsay, May 4, 1956), an improbable elevational change of 18.72 feet in the lifetime of the trees is computed. However, should accurate methods for dating cypress by annual-growth rings be developed, quite significant information could result.

Competition and Edaphic Changes

When changes were in the direction of drier swamp conditions, resulting from sedimentation, construction of drainage and navigation systems, and the building of levees and spoil banks which excluded overflow waters, other species of trees were frequently able to take over from the more finicky cypress. In addition, because many lumbermen cut no hardwoods or only the very best specimens, more hardwoods were available for seed production and to furnish competition to the relatively intolerant cypress. The net result of all factors was that cypress was unable to retain control of most of the areas that it once dominated. Reliance upon completely natural regeneration has not resulted in significant reestablishment of cypress.
Artificial Reforestation

Interest in bottomland forest management lagged far behind that in the better-drained lands of the South. In the latter areas, pines usually were the dominant trees. Pines presented less complex silvical problems, and the firmer, better-drained terrain made study, reforestation, management, and logging much easier and less expensive than in the bottomland forests. Also, there was a greater need in terms of land utilization because the pinelands were more extensive and wild hogs and fires prevented the trees from regenerating as rapidly on them as on the cut-over bottomlands. Official interest in the bottomlands remained very low until the 1940's, which was long after great progress had been made in growing pines. As an example of this lag, the writer located only one forester in the employ of the many owners of former cypress lands in the area of study. Work with cypress has trailed far behind that with other trees. Even now there is probably less knowledge of cypress than of any other commercially valuable tree in Louisiana.

Experimental Attempts

Little work has been done with artificial reforestation and management of cypress, in part because of the difficulty and expense of getting about in swamps. The most notable attempts to learn more about cypress reforestation are those of the Rathborne Land and Lumber Company
of Harvey, Louisiana (Bull, 1949:227-230; Rathborne, 1951: 239-240) and the experiments of the Tennessee Valley Authority (Bull, 1949:227-230). The Rathborne plantings in the Choctaw swamp area of Lafourche Parish represent the first reforestation of cypress in its native habitat in Louisiana. The first plantings were of wild seedlings; later, nursery-grown seedlings were utilized.

Nursery Seedling Production

The first nursery seedlings were produced at Southwestern Louisiana Institute at Lafayette (Gooch, 1953: 37-38). In 1951 the Louisiana State Nursery at Oberlin began production of cypress seedlings. An average of 204,656 seedlings per year was produced by the state nursery in the period 1951-1967. The greatest number produced was 895,450 in the 1952-1953 season; none were produced in the 1958-1959 season (Nursery Production Records, unpublished). Plans now are to phase out production because of low demand. Only 3,000 seedlings were produced in 1971-1972 (Frazier, May 24, 1972). In fact, most cypress seedlings were being sold to out-of-state purchasers (Gunter, July 10, 1967), and Mr. Gunter felt that perhaps relatively few were being planted for

13 This cypress reforestation project has been abandoned "... because the percentage of seedlings eaten by rabbits and killed by vine overgrowth, coupled with rising labor costs made it economically unfeasible" (Letter from Mrs. M. R. Lumbley, July 13, 1967).

14 Now the University of Southwestern Louisiana.
commercial forest regeneration (May 25, 1972). Possibly the peak season of 1952-1953 was to a degree a response to publicity hailing cypress reforestation. Articles, such as those by Bull (1949:227-230), Peters and Holcombe (1951:18, 32-33), and Rathborne (1951:239-240), generated much interest and discussion. This is indicated by the appearance of a number of other articles shortly thereafter ("Cypress Seedlings Available; Louisiana Forestry Commission to Distribute 500,000 Seedlings," 1952; Gooch, 1953; Kerr and Morgan, 1953; Puneky, 1952; Sternitzke, 1955; Wurzlow, 1953).

There may have been a degree of sentimentality behind some of the interest shown and planting undertaken. It was easy for many to remember the glorious days of cypress logging and, in some cases, the wealth that came from that activity. It is common to recall bygone days with nostalgia, particularly if there really are some pleasant things to remember. Perhaps in some instances where wealth was initially acquired from cypress, there was the feeling of a need to replace or regenerate the original source of economic well-being. However, there were others who very sincerely felt that the cutover cypress swamps should be made productive again, if at all possible.

Economic Feasibility and Obstacles

The economic feasibility of cypress reforestation
is doubtful for a number of reasons:

1. The cost of planting seedlings in swamps is rather high as compared with planting other species on well-drained lands. In large swamps there is very likely to be standing water during the planting season. Wading and pulling a pirogue loaded with seedlings and planting by hand is very slow work (Kerr and Morgan, 1953:10-15).

2. There is some danger of the seedlings' being drowned. In a few cases the water level can be manipulated, but this is expensive.

3. Nutria (Myocastor coypus) and swamp rabbits (Sylvilagus aquaticus) have caused considerable damage to cypress plantations (Blair and Langlinais, 1960:388-389). Putnam (1963:11) mentions that deer and cattle also feed on cypress seedlings.

4. Overcrowding of the seedlings by ground cover (weeds and other low-growing plants) and competition from other trees are frequent problems. In order for successful germination of seeds and initial growth of seedlings to

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15 The only available estimate of the cost of planting a thousand seedlings is as follows: collecting seed: $2.00; nursery operation: $5.00; transplanting of seedlings: $16.57; estimated overhead: $1.43; Total: $25.60 (Rathborne, 1951:240).
occur, the areas have to be relatively clear of weeds, shrubs, vines, and bushes that form a closed mantle above the cypress. Then, once the young cypress is up and growing, it must have freedom from overhead competition at least to the extent of being able to keep its growing tip in direct sunlight (Putnam, 1963: 10-11).

5. Fires, even though they be infrequent, take serious tolls of cypress. One fire every generation or two can cause irreparable loss. The accumulation of organic matter will burn furiously, damaging all seedlings, saplings, pole-sized trees, and some trees of saw-timber size.

Fire is one of the most important causes of degeneration and failure to reproduce in the cypress-tupelo swamp forests. In the muck-swamp phase of such forests, fires that occur during extreme droughts may seriously deteriorate the site by consuming the organic soil (Putnam, Furnival, and McKnight, 1960:14-15).

6. Diseases and insects are ever-present hazards.

7. The slow rate of growth and development of heartwood mitigates against the economic feasibility of cypress reforestation. Cypress is generally considered to be a slow growing tree, especially those that are located in poorly drained habitats. However, under
well-drained conditions with little or no interference from diseases, insects, competition, and the like, cypress will add height as rapidly as does pine, at least in the first few decades. Dr. Clair A. Brown reported the findings of many cypress trees less than one hundred years old with diameters of around 3 feet, and other cypresses of about twenty years of age, planted in a frequently flooded area, with diameters ranging from 2 to 12 inches (1951:37). The rate of growth of cypress depends upon a number of factors; apparently almost any given factor, and certainly any two given factors, can seriously affect growth rates. Fifty-to-fifty-six-year-old, second-growth cypresses found on old rice fields on moist, rich soil in South Carolina were reported to be tall, straight, and clear stemmed, with diameters of 17 to 25 inches 2.5 feet above the buttresses.

This is very good growth, but the following statement tempers its significance: "However, the wood is principally sap, and, therefore, lacking in resistance to decay, a valuable characteristic of original-growth cypress" ("Second Growth Cypress," 1936: n.p.).
Estimates on the Choctaw swamp cypress plantings indicate that in 70 years the trees should average 12 inches in diameter at the top of the first log (about 20 feet above the ground). After 70 years, the trees should add diameter at the rate of about 1.5 inches every ten years.

Since a 70-year-old tree would contain little heartwood, and since volume would be increasing rapidly, it would probably pay to hold the best trees until they were well over 100 years old (Bull, 1949: 230).

The rate at which heartwood is developed is clearly a most important factor in determining the economic feasibility of cypress reforestation, because, in the opinion of most foresters and lumbermen, sappy cypress is no better than sappy pine. Actually, there is a wider variation in penetration and retention of artificial preservatives in cypress than in pine. Therefore, the utilization of sappy cypress for utility poles, piling, and posts is not likely to develop to any significant degree (Fassnacht, February 1, 1964). Too little is known about rates of growth and development of heartwood at present. As a matter of fact, the conditions necessary for the development of heartwood are not known. One forester reported that some 200 to 300
year old cypresses did not produce good lumber (Lehrbas, February 1, 1964). Also, it is difficult to predict demand 100 to 200 years from now.

8. Management of either naturally or artificially reforested areas is difficult. Movement through the swamps, whether they contain water or not, is slow and difficult. Thus, the expense of management is likely to be prohibitive.

9. Logging costs are high—too high for selective cutting, which is considered necessary for good management. Swamp logging costs, even under the best conditions, are greater than costs for pines or for well-drained bottomland forests. On the subject of the logging problem, John A. Putnam wrote, "In the broad view, this is the greatest need relative to forestry in the swamps" (1963:17). Mr. Putnam, it might be added, is one of the more optimistic concerning the feasibility of swamp forestry.

The above-mentioned factors, at present at least, have greatly curtailed swamp reforestation. Few individuals or companies are willing to invest in cypress reforestation.

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16 John A. Putnam, long associated with the Southern Forest Experiment Station, Stoneville, Mississippi, has for many years been acknowledged to be the foremost bottomland forester. Today's interest and information in this area stems primarily from Mr. Putnam's pioneering work.
and management in the face of such formidable problems. The Louisiana Forestry Commission is studying bottomland hardwoods with the objective of dealing with the problems and feasibility of swamp forest management. Swamp forestry may be made profitable, but the species will not be cypress. Tupelo gum seems more promising at present than any other.

Properties and Uses of the Wood

The excellent qualities of cypress eventually led to the elimination of all sizeable commercial stands. Without these desirable qualities, of course, cypress would not have been so important, and the cultural and physical changes that occurred in association with the industry would not have come about.

Perhaps the most important property of virgin cypress is its durability under hot, humid, and acidic conditions. This and following remarks apply only to old-growth, virgin cypress.17 Cypress is resistant to rot and termites because of cypressene oil (Kantner, 1955:4; Campbell and Clark, 1960:250; Ellis, 1930:139; Lindsay, n.d., unpublished manuscript; Neubrech, 1939:10-11). Some believe that the amount of cypressene oil in the wood is directly associated with growing conditions. It is said

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17 Studies conducted at the United States Forest Products Laboratory, Madison, Wisconsin, indicate that the decay resistance of the heartwood of second-growth, or "grosbeck," cypress does not substantiate the reputation of virgin cypress (Campbell and Clark, 1960:250-253).
that trees growing in water all the time will manufacture more of the oil than those that stand in water part of the time. This supposedly is a result of slower growth and a greater percentage of salts in permanent swamps (Kantner, 1955:4; Lindsay, n.d., unpublished manuscript). Darker colored cypress, particularly red cypress, reputedly is more durable than white or yellow cypress. Tests tend to confirm this notion, though age seems to be the more important factor (Campbell and Clark, 1960:253). As a result of their experiments on second-growth cypress, they said, "... no practical distinction as regards decay resistance of present-day timbers seems warranted between baldcypress from different areas or between baldcypress and pondcypress" (1960:253). This would seem to favor the idea of the importance of age as a determinant of durability. But, how old do the trees have to be? This question is unanswered. For whatever reason or reasons, virgin cypress was among our more durable woods.
CHAPTER III

PREINDUSTRIAL EXPLOITATION

When the Spaniards arrived in Florida and the French on the Mississippi Gulf Coast, they found the Indians using cypress, which the Seminoles of Florida called hatch-in-e-haw, meaning "everlasting" (Neubrech, 1939:8). The Europeans began using the wood, and in view of the abundance of cypress, its resistance to rot and attack by termites,1 and its relative softness and straightness of grain for ease of working, the choice was a good one.

French Period

Cypress, then, along with other woods such as oak, cedar, and pine, was used along the Gulf coast immediately

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1Termites may not have been a problem until this century in Louisiana because no evidence of their presence has been found in archeological remains (Dr. William G. Haag, May 8, 1972). Writers, such as Gay (1969:482) and Emerson (1955:490) report that Reticulitermes flavipes was widely distributed in eastern North America from Canada to Guatemala. No definite statements are made regarding the presence of termites in Louisiana before the year 1936, when Cryptotermes brevis was introduced (Gay, 1969:467). However, whether or not termites were present in Louisiana, cypress's resistance to them was important because it was shipped to termite-infested areas from the time of the earliest exportations until the end of its commercial production.
after the Spanish and French arrived. Plans were being made by the French as early as 1708 to establish timber trade from Louisiana, and two sawmills are known to have been in operation in Louisiana by 1716 (Surrey, 1916:368). By 1722-1723, considerable correspondence was being carried on between local authorities in New Orleans, and the directors of the Company of the Indies in France. This correspondence involved problems of acquisition, sawing, pricing, and exporting timber, including cypress, to France and its island possessions in the West Indies (Rowland and Sanders, Vol. II, 1929:255, 282-284, 344, 616-617, 620, 623, 627, 628). No record was found of a lumber trade between Louisiana and France prior to 1716, though as early as 1713, such trade was occurring between the French on the Mississippi coast and Pensacola, Santo Domingo, and Martinique (Moore, 1967:3). Certainly, it is safe to assume that planks and timber, including cypress, were being produced for local use soon after the establishment of New Orleans in 1718, because there was no other abundant building material available in the immediate area. The earliest date found where cypress was identified as a product of sawmills and an exported item is 1722-1723 (Rowland and Sanders, Vol. II, 1929:255, 282).

Seemingly insurmountable problems faced the early cypress loggers and sawmill operators. Logging for cypress was difficult and there was a lack of an efficient and reliable source of power for operating saws. In the
best of situations, cypress was located in boggy areas. There was a shortage of animals for power and, when they were available, the muddy conditions made dragging large logs difficult and frequently impossible. At least as early as 1723 the Council of Louisiana was directing officials and settlers in Louisiana to produce cypress planks and timbers for trade, stating that excuses for failure to do so were unacceptable. In reply, the Louisianians said that prices for their planks and timber were too low and that too few persons were available with knowledge of how to produce some specifications of desired wood products. Getting the logs from the swamps to the river banks was very difficult. Wagons and horses were scarce, and because of their scarcity, logs had to be moved by hand, which required many Negroes (Rowland and Sanders, Vol. II, 1929:282-284).

Girdling and Floating of Cypress

The French solved some of the problems involved in moving logs when they discovered that green cypress almost always sank in water, whereas dry cypress usually floated (Moore, 1967:10). Standing trees were deadened by girdling; thus, the trees were killed and lost sufficient sap to make them buoyant enough to float. Usually, trees were

Mattoon reported that about ninety-five per cent of the girdled and only ten to twenty per cent of the un-girdled trees were buoyant enough to float (1915:12).
girdled several months before they were to be felled in order to assure sufficient loss of weight. This task normally was done in summer and fall when swamps were driest. Felling of trees sometimes occurred during the dry season, in which case the trees were trimmed, topped, and infrequently cut into shorter lengths and left in the woods to await the spring rise of water. In most cases, however, the loggers delayed felling until the swamps flooded. Often wading into the swamps, but more often going out in boats, loggers felled, trimmed, and topped trees in the water. However, the expected spring rise of water did not always materialize. If this happened, the logs had to be left in the woods for another year or longer, during which time, they were subject to attack by pinhole borers or ambrosia beetles (Mattoon, 1915:12). When floodwaters did become deep enough to float the logs they were either poled or towed out. In poling, a man stood on a log, dug a pole into the swamp bottom and pushed. Towing involved wading and pulling the floating logs. Apparently, up to four or five logs, depending on size, could be poled or dragged out together. Where multiple logs were brought out, they were fastened together in tandem fashion. Float roads (sometimes called "trails" or "creeks") usually were cleared through the swamps at the time of tree deadening in order to facilitate moving the floating logs.
Logging with Animals

As early as 1722-1723, mules and oxen were used to tow logs out (Rowland and Sanders, Vol. II, 1929:282-284). Use was made of animal power if there was a bank firm and clear enough for them along the stream or lake. These conditions rarely prevailed. Wagons were tried, but found to be less satisfactory than floating due to their tendency to bog down in the soft ground. Dragging or "snaking" of logs across the ground by mule or ox teams also was unsatisfactory because the front ends of the logs tended to dig into the soft surface. Whether dragging logs or hauling them on wagons, the animals bogged down frequently. The use of animals in getting cypress out of the swamps never became widespread, though they continued in occasional use into the 1940's. Human towing and poling of cypress logs remained the major means of getting timber out of the swamps for over 150 years, until the beginning of the industrial cypress lumbering era. Once the logs were floated out to a stream or lake, they were made into rafts for drifting and poling to mills until the advent of steamboats.

Seasonal Nature of Cypress Logging

Cypress lumbering remained almost totally seasonal until the pullboat was invented in 1889. Prior to this invention, sufficient logs could not be gotten out of swamps by hand labor to keep sawmills operating year-round.
As seen in John Hebron Moore's account, a goodly portion of a year-round sawmill operator's time and energy were spent in trying to obtain a sufficient supply of logs (196?:60-73).

Shortage of logs plagued the lumbermen while Louisiana was under the control of France and Spain and pestered their successors, the Americans, until 1889. The great contribution of French loggers to the cypress industry was the application of the technique of deadening trees by girdling in order to make them buoyant enough to float.

Power for Saws—Hand Hewing

Among the problems facing sawmill operators were the lack of power for sawing logs into timbers and boards, and sawmill machinery. Well into the nineteenth century, hand hewing with a broadaxe and adze was used as a means of manufacturing planks and timbers. Because of the great labor requirements, this was not a practical means of producing more than token amounts of wood products for commerce.

Hand-powered Pit Sawing or Whipsawing

Certainly the French settlers knew of other techniques of milling. Horn reported that, as early as 1322 in Germany, sawmills were driven by waterpower (1943:134). In spite of their knowledge, pit sawing or "whipsawing," along with hand hewing, were the methods used during the early years. In whipsawing logs into finished products,
an iron saw some six to eight feet in length was employed by two men. One man stood on top of a log while his partner stood in a pit underneath. Doubtless, pits were not used in lower Louisiana because of the nearness of the water to the surface, the poor drainage, and frequent rains which would have kept them filled with water. The variation of this method, whereby a log was placed up onto a kind of scaffold or framework of timbers, is also an utilized (Figure 9). Here, a man stood above the wood rather than in a pit. Pit saws cut only on the bottom, whereas the man topside was there merely in an auxilliary position so the "pit man" could pass his saw through the cut. A line (from a gourd of water) was laid out on the topside of the log. A pole, or occasionally a spring-pole, which raised the free end of a downward stroke, took the place of the top sawyer (Bryant, 1922:3). Obviously, production of manufactured wood by pit sawing was very limited in quantity.

**Sash Saws**

As mentioned, the French were familiar with powered sawmills, and it is implied that at least as early as the seventeenth century these mills utilized sash saws (Moore, 1967:11). The early Louisianians' problem in making use of this type of saw was that of power. The sash saw (Figure 10), though an important technological advance, was but a
Fig. 9. Pit Saw or Whipsaw in Kentucky. Date unknown.

Liles.id, 1948: opp. 52
an iron saw some six to eight feet in length was employed by two men. One man stood on top of a log while his partner stood in a pit underneath. Doubtless, pits were not used in lower Louisiana because of the nearness of the water to the surface, the poor drainage, and frequent rains which would have kept them filled with water. The variation of this method, whereby a log was rolled up onto a kind of scaffold or framework of timbers, must have been utilized (Figure 9). Here, a man stood on the ground rather than in a pit. Pit saws cut only on the downward stroke, so the man topside was there merely to pull the saw up into position so the "pit man" could pull it downward, making the cut. A line (from a gourd of soot in most cases) was laid out on the topside of the log as a guide so as to get boards of a specified and uniform thickness. "Occasionally a spring-pole, which raised the saw after each downward stroke, took the place of the top sawyer" (Bryant, 1922:3). Obviously, production of manufactured wood by pit sawing was very limited in quantity.

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Fig. 9. Pit Saw or Whipsaw in Kentucky. Date unknown.

Lillard, 1948: opp. 52
Fig. 10. Sash Saw in West Virginia. Date unknown.

United States Forest Service photograph, from Lillard, 1948:opp. 117.
powered pit saw. The saw was held in a frame or sash which moved up and down between guides somewhat like the familiar sash window. The log rested on a carriage that slowly moved toward the saw, which, cutting on the down stroke, made a board. The sash saw's output was greater than that of a pit saw, but still was only about 500 board feet per day (Horn, 1943:22). A facetious statement indicating the low productivity of this type sawmill is given in an article quoting D. Clint Prescott, who stated:

A sawyer on one of these mills once told the writer that he could sit on a log that was being sawed and go to sleep. When the log had moved up far enough the saw would scratch him when it came down and he then had plenty of time when the saw went up to wake up and get off before the saw came down again ("Fifty Years of Advancement in Lumbering Equipment; Sawmill Machinery," 1931:83).

**Horserpower**

The earliest record of sawmills in Louisiana is for 1716, when two were reported to be operating in "lower Louisiana" (Surrey, 1916:284). How these mills were powered is not known, but they were probably pit saws, because in 1724 it was reported to the Directors of the Company of the Indies that:

There is a carpenter . . . who two days ago brought a model of a sawmill which will be operated either by hand-power or by horse-power. He intends to put nine saws in it although his model has only seven³ (Rowland and Sanders, Vol. II, 1929:344).

Apparently, this mill became operative, because five years

³A sash saw with multiple saws is known as a gang saw.
later it was reported that repairs and alterations were planned to make the mill operate easier and with two rather than the previously required eight horses (Rowland and Sanders, Vol. II, 1929:623).

**Waterpower**

The use of horses was not the only attempt to solve the power problem in early Louisiana. In another letter to the Directors of the Company of the Indies in 1729, it was reported that:

The only sawmill that has yet been in operation along the river was constructed last year . . . and it has not been in operation two months because it was not in a state of perfection. It is true also that since the water is at almost the same level along the river these mills will turn, at the most, only four months of the year4 (Rowland and Sanders, Vol. II, 1929:627).

How long hand- and horsepower were used is not known from the records. As indicated above, at least as early as 1729 the early millmen turned to water as a source of energy whenever possible. The waterwheel was placed in a ditch or trench cut across the levee. When the Mississippi River began to rise above normal level, the water flowed through the ditch into the swamps and, in so doing, turned the waterwheel (Pujol, 1939:142). Moore, however, reported that at New Orleans swamp water draining through the ditches into the Mississippi River powered these early

4The implication here is that water draining from the Mississippi River into the swamps through a tailrace in the levee was used as power.
New Orleans mills\(^5\) (1967:11-12). Also, it is known that floating or raft sawmills operated on the Mississippi (Horn, 1943:70; Kniffen, 1968:95), Calcasieu, and Pearl rivers and on Grand Lake (Lillard, 1947:159). Mention of these were found in literature, but no details of how they operated were located.

The records of Surrey (1916) and Rowland and Sanders (1929) indicate that cypress became more important as an item of export after about 1730. Information is spotty and often does not specify species of trees involved in the lumber trade. For example, Emory Q. Hawke reported 30 sawmills were producing lumber for sugar boxes in the year 1800 (1934:279). But no reference is made to the species. The chances are rather good, however, that many of the sugar boxes were made of cypress because it is known that they frequently were made of that wood. Only occasional references were found regarding location, and in some instances, ownership and output of mills, until about the middle of the nineteenth century. After that time, records become somewhat, but not much, better.

**Part-time Logging and Sawmilling**

Apparently, prior to the steam sawmill most Louisiana cypress lumbermen engaged in the activity on a

\(^5\)It would have been impossible for the Mississippi River to have been low enough in lower Louisiana for swamp drainage into the river to power saws. The swamp water surface rarely got above sea level and the river never below it.
part-time basis. Many logging operations and swamills were operated by plantation owners, who used these activities as supplements to agricultural income (Cotton, July 2, 1958; Moore, 1967:11). During the slack farming seasons, the plantation owners would put their slaves to work logging and sawing cypress. If the owner did not operate a mill, he would sell the logs to someone who did. Also, many yeoman farmers logged cypress ("Fifty Years of Advancement . . .", 1931:83; Richardson, April 29, 1958)--often from public lands--during off-seasons.

Lumber Trade During the Pre-American Period

At any rate, in general, cypress lumbering and shipments slowly increased during the colonial period. It is known, for example, that in the late 1730's cypress lumber was being shipped from Louisiana precut and marked, ready to be assembled into houses. These prefabricated houses were shipped to French-controlled islands in the West Indies (Surrey, 1916:379). There were, of course, numerous increases and declines in the lumbering activity due to political developments regarding the colony and general economic fluctuations. For example, under Spanish rule, Louisiana lost its lumber customers on Santo Domingo, Martinique, and the Windward Islands. As a result, exportation of lumber of all kinds virtually ceased. After 1770, the Spanish government opened all Spanish ports to Louisiana trade, and shortly thereafter, even
permitted trade with the French West Indies, and finally awarded Louisianians a monopoly on the making of sugar boxes (Moore, 1967:6-7). The latter policy change led to an increase in lumbering activities; thus, Hawke (1934:279) was able to report 30 sawmills producing lumber for sugar boxes in 1800.

American Period

Steam-powered mills.--Unlike the failure to advance the techniques of logging, means of powering sawmills and methods of sawing made advancements during the eighteenth and nineteenth centuries. A steam sawmill was put into operation in New Orleans in 1803, though it was burned in 1806—reportedly by jealous hand sawyers who feared loss of their jobs (Moore, 1967:14; "New Orleans--Important Lumber Center...", 1931:137).

From 1803 onward, steam mills increased in number in Louisiana. By 1807 at least one steam mill, using gang saws, was in operation in New Orleans (Moore, 1967:15). A circular saw was in operation by 1817 (Nile's Weekly Record, 1817:336) and was followed in 1870 by a successful band sawmill (Horn, 1943:135-136). The important point, relative to sawmilling, is that by the time there was a large demand for cypress and methods of getting large quantities of the trees out of the swamps, the millmen were ready with a form of power and efficient equipment for converting logs into finished products on a grand scale.
Landscape Changes by Early Lumbermen
French and American

The early lumbermen left few enduring marks on the landscape that are recognizable today, in spite of a very pessimistic report in 1774 that:

The cypresses were formerly very common in Louisiana; but they have wasted them so imprudently, that they are somewhat rare. They felled them for the sake of their bark, which they covered their houses with and they sawed the wood into planks which were exported at different places. The price of the wood now is three times as much as formerly (Le Page du Pratz, 1947:217).

Their methods of logging were such that they cut only the best trees in the most accessible locations. Total production and effect upon cypress forests were not great. Such scars as were made on the landscape at the time were minor. This is especially true in view of the later industrial lumbering activity which, along with settlement and development, obliterated most early scars. Evidence of early lumbermen consists of the removed trees and any crevasses they may have caused in order to flood swamps so their felled timber would float.
CHAPTER IV

INDUSTRIAL EXPLOITATION--THE SEQUENCE

Meanwhile, events had been occurring in the north­eastern portion of the United States that pointed lumber­men southward. Before investigating the invasion by Northern lumbermen, perhaps it would be well to review conditions and happenings that led to the development of industrial lumbering in the South in the latter part of the nineteenth century.

All coastal states with timber of good quality, easily moved to seaports, developed a timber industry soon after settlement by Europeans. However, the major economic emphasis of the South was upon agriculture and, as a result, there was only limited commercial or industrial interest in Southern timber supplies, especially in the Gulf region, until after the Civil War.

General Considerations

Following the War, there was an increase in the migration of settlers into the western grasslands; with this movement there were greatly increased demands for lumber. As the entire population and economic development increased rapidly and the population center shifted west­ward, the lumbering industry around the Great Lakes
increased in importance. New England's forests were nearing exhaustion by the middle of the nineteenth century, and eastern lumbermen looked westward to the "inexhaustible" pineries of the Lake states (Horn, 1943:29). By 1870 Michigan had gained first place and Wisconsin fourth in the volume of lumber produced. Pennsylvania ranked second and New York third. The census of 1890 revealed that Michigan still held first place, and Wisconsin was second with more than twice the volume of third-place Pennsylvania.

The lumbering industry continued its shift from the Northeast; and, as Lake states' resources were exhausted, the shift moved southward and westward. In 1880, the Lake states, with 35 per cent of the national production, took leadership from the Northeast. Twenty years later the Lake states were still important, with 25 per cent of the production, but the South was in the position of leadership with 32 per cent. By 1910, the South produced nearly 45 per cent and the western states about 18½ per cent. The pre-eminence of these areas continued, and by 1920 the South produced more than 42 per cent and West more than 35 per cent of total national lumber. The South held the leadership in volume of lumber produced from 1900 (Horn, 1943:28-32) to 1926 (Statistical Abstract of the United States, 1928:690).

The movement of the industry from the Northeast, begun as a freshet in the 1850's and increasing in momentum after the Civil War, became a flood in the last
decades of the nineteenth century. As the flood subsided in the Lake states, the industry moved southward and westward. Stewart H. Holbrook, in chronicling the movement of the lumber industry, stated:

'. . . 'way back in the eighteenth thirties, Maine loggers said the Penobscot timber would last until hell froze one foot thick; they never thought they would be leaving Maine . . . . Half a century later, as they moved on again, this time from Michigan into Wisconsin and Minnesota, they figured it would take a hundred years to clean up the last of the Lake states. And then—quite suddenly, it seemed . . . they got a shock (1944:152-153).

Some recognized what was happening during the latter part of the nineteenth century. For example, in 1884 it was reported that Michigan, Wisconsin, and Minnesota supplied the bulk of the lumber for the area between the Rocky Mountains and the Mississippi River, and that in the near future the area would have to "... depend upon the more remote pine forests of the Gulf region or those of the Pacific Coast" (Sargent, 1884:536). In reference to Louisiana, Sargent wrote: "The most valuable forests of the state are still almost intact" (1884:536). Sargent had the pineries of the state in mind. At that time, it was generally felt that most of the accessible cypress had been logged. Later, technical developments opened additional large cypress forests to the lumbermen, for there were valuable forest resources in Louisiana, and events were leading toward their exploitation. The forces of exploitation converged on the pine forest around 1880, and a decade later, on the cypress.
The advent of industrial lumbering in Louisiana was a result of increased demand for lumber, declining Northern lumber resources, improved techniques and equipment for logging, and the development of railroad systems. Also, some Southerners had long wanted to break the economic domination of agriculture, and now the opportunity presented itself. Furthermore, the invention of the steam skidder in 1883 by Horace Butters of Ludington, Michigan (Bryant, 1923:214), and its later improvements, and the development of a system of logging railroads provided the means for supplying the more efficient sawmills with adequate logs for year-round operation. Butters' invention was later to be successfully adapted to swamp conditions.

Prior to the construction of a railroad network in Louisiana, logging operations were almost entirely restricted to the watersheds of a few streams, such as the Atchafalaya, Calcasieu, Pearl, Plaquemine, Red, and Teche, from which log movement by water was possible. The basic railroad net was completed in the decade 1880-1890 (Robinson, 1947:54); the first train to make the run between New Orleans and Chicago was in 1873, and in 1883 the rail links between California and New Orleans were completed (Louisiana: A Guide to the State, 1941:83). The rapid growth of the rail system in Louisiana is indicated in Table 1 (Statistical Abstract of the United States, 1942:478). By 1920, Louisiana's railroad mileage had begun to decline, at least in part because of the
abandonment of many logging operations, and in 1967 was 3,807, some 1,747 miles (Statistical Abstract of the United States, 1969:561) less than existed in 1910.

TABLE 1

LOUISIANA RAILROAD MILEAGE
FOR SELECTED YEARS

<table>
<thead>
<tr>
<th>Year</th>
<th>Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>335</td>
</tr>
<tr>
<td>1880</td>
<td>652</td>
</tr>
<tr>
<td>1890</td>
<td>1759</td>
</tr>
<tr>
<td>1900</td>
<td>2824</td>
</tr>
<tr>
<td>1910</td>
<td>5554</td>
</tr>
<tr>
<td>1920</td>
<td>5223</td>
</tr>
</tbody>
</table>

It is difficult to analyze the relationship between railroad construction and the lumbering industry, largely because no census data were collected on logging railroads, and very few railroads were both loggers and common carriers. Furthermore, virtually no literature exists on Southern logging railroads. Thus, at any given date, the number or length of logging railroads is unknown. Data were found covering two years for Louisiana logging railroads. In 1887 there were 11 logging railroads with a total of 13 locomotives, 148 cars, and 69 miles of roads ("Lumber and Logging Railroads of the United States," 1887:262-271). In 1907, there were 132 logging railroads with a total of 351 locomotives, 5,022 cars, and 1,692 miles of roads (Register of Sawmill and Planing Mill
Auxiliary Equipment for 1907. Including 1,607 Steam Logging Railroads . . . 1907:130).

Caution must be exercised in generalizing the relationship between industrial lumbering and railroad building. The period of industrial lumbering in Louisiana coincided with the latter part of the era of great railroad expansion in the South, the Mississippi Valley, and the West. Railroads were built when and where it was felt they would be profitable. Certainly, some common carriers were built in Louisiana primarily to exploit timber. Clark implied that the Jasper and Eastern\(^1\) and the Louisiana and Arkansas Railroad Company\(^2\) lines were built to exploit timber (1958:248, 252).

Certainly commercial timber of all kinds contributed to the growth of railroads. However, most, if not all, common carriers would have been constructed without the timber resources because of the expansion fever existing from after the Civil War into early twentieth century. There was need for movement of goods, such as cotton, rice, sugarcane, petroleum, natural gas, salt, and sulphur. It is quite true that a decline in industrial lumbering was a

\(^1\)One writer stated, "When the Santa Fe railroad extended their lines from Kirbyville to Oakdale, they interested hundreds of sawmill operators in locating on the road and at one time had a sawmill every five miles on that stretch" (Kerr, 1963:15).

\(^2\)This line was constructed from Stamps, Arkansas, to Springhill, Louisiana, and eventually on to Jena, with branch lines between Packton and Pineville and Minden and Shreveport.
likely cause for the contraction of common carrier mileage, but this coincided with the general period of declining railroad mileage in Louisiana and nearby states. Some lines were abandoned because of:

... ill-advised expansion, others the exhaustion of resources which had been responsible for the original construction. Some branches were unable to meet the competition which siphoned off enough tonnage to render profitable operation impossible (Clark, 1958:281-282).

The foregoing discussion of industrial lumbering and railroad construction dealt principally with common carriers, not logging railroads. As mentioned, census data did not include logging railroads unless they were also common carriers. Logging railroad mileage was in a constant state of flux as old railroad lines were taken up and put elsewhere. Very few of the logging railroads were also classified as common carriers. A notable example is the Garyville-Northern, operated by Lyon Lumber Company of Garyville. This line was constructed to log cypress, and after this resource was exhausted in the 1920's (Forrest, February 10, 1972) the line was extended northward into pine forests as far as southern St. Helena Parish, a distance of some fifty miles from Garyville. It ceased operation around 1931 when the company's timber resources were exhausted. No instance was found of a common carrier's being constructed solely for the purpose of

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3In Louisiana, this could refer only to timber, as no other extractable resources were being exhausted.
exploiting cypress and remaining in operation after its timber resources were exhausted.

Industrial lumbering of cypress swamps could have gone forward regardless of railroads, because of the development of the pullboat, although pine exploitation would have been much delayed without railroads. However, industrial exploitation of cypress would have been neither as intensive nor as extensive without railroads. It is impossible to state how much mileage developed as a response to logging (whether speaking of cypress, pine, or both), but certainly the industrial lumbering era greatly affected railroad construction and, in turn, was influenced by railroads.

To repeat, several factors were pointing toward an industrial lumbering development in Louisiana in the latter half of the nineteenth century. Again, there were sawmills here to be sure, but they were small operations, and more often than not, cypress mills operated on a seasonal basis. Large, modern mills, such as those around the Great Lakes, were nonexistent in Louisiana. Mills capable of producing 30 to 40 thousand board feet per day were very uncommon, and a capacity on the order of 50 thousand or more per day was and is considered to be about the minimum size for a mill to be classified as "industrial" or "commercial." Admittedly, this is an arbitrary criterion, but it is one that is and was used by those concerned with the lumbering industry.
Evolution of Logging Methods

Many lumbermen had long desired to exploit cypress swamps, but lacked logging methods that would render swamp forests accessible. Though few had anticipated it, the evolution in methods came abruptly with the invention of the steam skidder, previously mentioned. A patent was granted in 1883 on a steam-powered overhead cableway skidder developed to obtain logs from potholes and swampy spots in the Great Lakes area. Horace Butters, the inventor of the steam skidder, was among those who realized that Lake states' logging was on the decline. He moved southward looking for timber. To meet local conditions he installed his equipment on a barge or scow, and tried out his device in a North Carolina swamp\(^4\) (Bryant, 1923:214). This scow-mounted skidder, called a "pullboat," underwent sufficient improvements\(^5\) to become an effective means of removing large quantities of logs from swamps.

Just as there is some uncertainty regarding the origin of the first pullboat, there is also vagueness

\(^4\)One author disagreed on the first such operation as follows: "Perhaps the first pull-boat, or in fact, the first pull-boat process, was used in the Louisiana swamps by a man by the name of Thornton, who had a small mill at Baldwin. We have not the dates, nor the time to get them, but know it was in the Eighties" (Glenn, 1931:71).

\(^5\)Details of modifications of the initial scow-mounted skidder and of pullboat operation in the industrial period are given in the succeeding chapter.
concerning the beginning of swamp railroad logging. One
source (Williams, 1908:4) indicates that it occurred in
1891 or 1892. Others stated that in 1893 four companies^6
began successful overhead cableway railroad skidder opera­
tions in swamps (Glenn, 1931:71; "Loading and Skidding,"
1931:85). Primarily because of the expense involved, the
chances of four companies' initiating experimentation in
swamp railroad logging the same year seem remote; thus, the
date 1891 or 1892 is probably correct.

With 1889 as the initial date for the pullboat and
1891 or 1892 for swamp railroading, 1890 can then be
selected as the beginning of the industrial cypress
lumbering era. Swamp industrial logging was difficult and
expensive, but because of the dense stands of high-quality
cypress, a good market, and the efficiency of pullboat and
railroad logging, many operators profited handsomely.

The nature of cypress, the expense of swamp logging,
and the remoteness of the markets meant that the most
successful operations were large in scale, with large
timber holdings and integrated logging and milling facili­
ties. These factors, along with potential profits, en­
couraged the development of big mills, including saw and
planer mills, lath, shingle, sash, and other dimension-stock

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^Ruddock Cypress Lumber Company, Ruddock, Louisiana;
Lutcher & Moore Cypress Lumber Company, Lutcher, Louisiana;
Swanee Canal Company, Atlanta, Georgia; Wilson Cypress
Company, Palatka, Florida.
factories. Large timber holdings and mills were also encouraged by the fact that most cypress was air dried, which required one year per inch of thickness. This meant that extraordinarily large inventories had to be carried in order to fill purchase orders.

Industrial exploitation of cypress began rather suddenly. Its debut was in Louisiana, though this state, along with other Southern coastal states, especially the Carolinas and Florida, had a long history of small mills and trade in cypress (Glenn, 1931:70) and other woods. The large-scale phase of the industry began in Louisiana, in part because of almost annual Mississippi River overflows; extensive, almost pure, stands of cypress; and direct rail and water connections with the developing upper Mississippi Valley. Flooding of the swamps made logging by pullboat and float methods technically successful, while shipment up the valley toward the Great Lakes made it economically successful.

The declining Northern lumber industry, increasing demand for Southern wood, availability of cheap timber lands, an improving rail transportation system, and evolution of logging and milling techniques brought about a dramatic increase in exploitation of Louisiana's forests. Mills cutting all kinds of wood increased from 175 in 1880 to 432 in 1900 (Defebaugh, Vol. 1, 1906:501), and the product value advanced from $1,764,644 to $17,408,513 for the same period. Cypress production increased from an
concerning the beginning of swamp railroad logging. One source (Williams, 1908:4) indicates that it occurred in 1891 or 1892. Others stated that in 1893 four companies began successful overhead cableway railroad skidder operations in swamps (Glenn, 1931:71; "Loading and Skidding," 1931:85). Primarily because of the expense involved, the chances of four companies' initiating experimentation in swamp railroad logging the same year seem remote; thus, the date 1891 or 1892 is probably correct.

With 1889 as the initial date for the pullboat and 1891 or 1892 for swamp railroading, 1890 can then be selected as the beginning of the industrial cypress lumbering era. Swamp industrial logging was difficult and expensive, but because of the dense stands of high-quality cypress, a good market, and the efficiency of pullboat and railroad logging, many operators profited handsomely.

The nature of cypress, the expense of swamp logging, and the remoteness of the markets meant that the most successful operations were large in scale, with large timber holdings and integrated logging and milling facilities. These factors, along with potential profits, encouraged the development of big mills, including saw and planer mills, lath, shingle, sash, and other dimension-stock

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6 Rudderock Cypress Lumber Company, Ruddock, Louisiana; Lutcher & Moore Cypress Lumber Company, Lutcher, Louisiana; Swanee Canal Company, Atlanta, Georgia; Wilson Cypress Company, Palatka, Florida.
estimated 45 million board feet in 1879 to over 248 in 1899 (Steer, 1948:193). The peak of production was reached in 1915 when over one billion board feet were produced (Nellis, 1917:14). The forest products industry became big business, and lumber milling was the first truly large manufacturing industry in Louisiana.

The assault upon cypress was short-lived. By 1925 the heyday of cypress lumbering was over, and there remained only the clean-up operations that exploited the few remaining commercial stands. The last company which could be called an integrated industrial cypress operation sawed its last cypress logs in early 1956 (Claude H. Lindsay, April 10, 1956), though a number of the former giant operators, such as Rathborne Land and Cypress Lumber Company Limited, and A. Wilbert's Sons Lumber and Shingle Company, continued to operate small mills that were midgets compared with the companies' former operations. Though impossible to accurately assess at this late date, the industrial cypress era brought important landscape modifications to Louisiana, especially to the swamps and their highland rims. Some of the changes will be recorded in the following pages.

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7 It should be noted that these small mills cut far more hardwoods than cypress, which simply was no longer available in significant amounts.
CHAPTER V

INDUSTRIAL EXPLOITATION--THE OPERATIONS

It seems that the most interesting, and certainly the most important, landscape-changing part of the industrial cypress story occurred in the swamps. A discussion of the swamp activity follows, taking first the preparation and felling of the trees, and then the methods of removing the logs. It should be mentioned at this point that the old method of hand or float logging overlapped the steam power of the industrial era.

Girdling

No matter what means of moving logs out of the swamps was used, cypress was usually girdled (Figure 11), because the trees were to be floated out; this was desirable for other reasons, such as:

1. Dry logs would float in mill ponds.
2. The sapwood of dead cypress is tougher than that of green ones, thus skidding tongs would not pull out so easily.
3. Green cypress heartwood swells during milling and binds the saw (Bryant, 1923:100).
4. If cypress was sawed while green, mildewing was a more serious problem (Cotton, August 12, 86)
Fig. 11. Girdled cypresses, circa 1903-1904. Note height of ring.

American Lumberman
5. When a tree was sawed while green, the sap dried in the wood and turned the product a dirty color (Richardson, April 29, 1958).

Cypress trees were deadened at least several weeks, and frequently several months, in advance of felling.

Floating

If the timber was to be floated out, "creeks" (or "roads" or "trails") were cut at intervals, usually one-half mile apart, during the dry season which could mean either the surface was exposed or was covered with less water than during the wet season (winter and spring). In float logging, the felled trees were then poled or dragged to the trails where they were made into tows for movement to deeper waterways for collection into rafts. The swampers usually preferred to wade, if water was not too deep, because they could bring out more logs each trip. They would sink their axe into the first log and push and pull the tow of five or six logs along. The logs were fastened in tandem with wire or chain (Richardson, April 29, 1958), a method used since early French settlement in Louisiana.

Logging by hand or float methods left few reminders except for crevasses deliberately caused in order to flood swamps so that logs could be gotten out. This reportedly was a common practice in the old days ("The Swampers and the Levees," Iberville South, March 20, 1897). An industrial form of float logging was practiced at a later time.
This method was first used near Camden, Arkansas, in 1917, and later in Louisiana (Harless, Denver, July 14, 1960; Harless, Ivan L., Jr., July 13, 1960). The technique is discussed later in this section.

**Pullboat Logging Development and Operation**

The pullboat operated through a cable stretched between a nearby tree (spar tree) or a tall tower mounted on the scow, and a "tail" tree situated several hundred feet back in the woods. A light carriage, or block, was suspended on wheels from the overhead cable. Logs could be pulled in from a distance of 700 to 800 feet (Bryant, 1923: 214).

The system worked, but it had serious disadvantages: First, too much time was required to rig the system at each new setting. Second, the slack in the skidding line required five or six men to pull it from the carriage to the logs to be skidded, because Butters's system did not have a rehaul line to carry the cable back into the woods. Third, due to the limited distance that logs could be pulled, expensive construction of numerous canals was necessary; leaving much timber in the woods was the alternative (Williams, 1908:3). In spite of the disadvantages of Butters's system, Williams reported one of the "primitive machines" still in operation in North Carolina in 1908 (Williams, 1908:4).
Though Butters initiated the technical breakthrough, it remained for William Baptist of New Orleans to adapt successfully the scow-mounted skidder to swamp logging in 1889 (Bryant, 1923:214; Horn, 1943:121; "Loading and Skidding," 1931:85). Baptist put his system into operation for the Louisiana Cypress Lumber Company of Harvey, Louisiana. Among his innovations was a rehaul system and a cable on the ground, rather than an overhead cableway utilizing spar and tail trees.\(^1\) Basically, the pullboat utilized two friction drums.\(^2\) One drum was geared for pulling power and the other for high speed. A light cable, usually 5/8 to 3/4 inch diameter, was pulled by hand through a cleared right-of-way known as a "run" (or "trail") to distances up to five thousand feet. At the "back", or far end of the run, the cable was passed around a sheave block (Figure 13), which the pull-boatmen called "shiv." The sheave block was placed horizontally on a platform and firmly anchored to a tree. Then the end of the cable was pulled back to the pullboat where it was spliced to the end of a larger cable, which usually was 7/8 inch to 1\(^1\)

\(^1\)In the context of his writing, Horn implied that there had been prior attempts at utilizing the ground system, but they failed because of the difficulties involved in dragging big logs through the swamps (1943:121). It is not known if he is referring to Thornton, mentioned by Glenn (1931:71) above.

\(^2\)Most large pullboats had three drums. The third, smaller drum used light line, usually 3/8 inch, to pull the messenger cable out when runs were changed (Bryant, 1923:133) (Figure 12).
Fig. 12. Repairing a three-drum pullboat. A new boiler was acquired, and it, along with the machinery from the old pullboat at the right, are being installed on the new barge. Blind River, St. James Parish, 1958.

Ervin Mancil
Fig. 13. Sheave block. Note the blaze on the tree.
Date unknown.

Bryant, 1923:235
inches in diameter. The free end of the small cable, called "messenger," was attached to the power drum. As the messenger was wound up on the drum, the big cable, known as the "power," or "pulling," cable, was drawn out to the sheave block. The ends of both cables, now at the sheave block, were spliced together. The messenger at the pullboat was then transferred to the high-speed drum and that of the pulling cable to the power drum; now logs could be snaked (dragged) in by the pulling line, which then could be quickly returned to the sheave block by winding the messenger up on the high-speed drum. The result was a back-and-forth system (Figure 14). The pulling cable could not pass through the sheave block because of buckles or rings spliced into it. Four buckles were attached at 50-foot intervals, and short cables were fastened to them for attaching loads of logs to be pulled. As the pulling line came in with a load of logs, the messenger was played out and passed through the sheave block. When the logs reached the "deck" at the pullboat, they were detached, and the high-speed drum put into operation. As the messenger was wound onto its drum, the line moved around the sheave block and back toward the pullboat and, in so doing, hauled the power line back into the swamp toward the sheave for another load.

Since this rig did not utilize towers or tail trees, it was much easier and faster to set up, and it could reach farther into the woods. Logs were skidded
Fig. 14
Schematic Diagram of a Pullboat

Messenger cable

Sheave block

Pulling cable

Towing cables

Not to scale
along the ground through the cleared paths, or runs. However, since the logs were skidded on the ground, there was initially much trouble with their burying themselves in mud and snagging on roots, stumps, and buried logs. To overcome these problems, Baptist invented the pullboat cone. This was a shallow, cone-shaped device made of iron, with a hole in the center or vertex. The cable to which the logs were attached was run through the hole, thus allowing the cone to slip down to form a buffer in front of a load of logs. This helped alleviate the problem of burying in the mud and snagging on obstructions because the cone tended to ride on top of the mud and over roots, logs, and stumps. Horn said, "Mr. Baptist's contribution to the logging art was simple but effective" (1943:121) and, in the context in which the statement is found, implies that this was William Baptist's only important contribution. E. C. Glenn (1931:71) seemed to share Horn's view. Other sources (Bryant, 1923:214; "Loading and Skidding," 1931:85) implied that Baptist's contribution may have been greater, and this certainly is true in view of the easier rigging at each new "set," or pullboat site, the greater distances that could be pulled, and the rehauling of the pulling cable to the back sheave block.

The cones were not without disadvantages, however. They were big, heavy, and cumbersome, and the logs frequently jumped out of them. In addition to the difficult task of refitting the cone over the ends of the logs, the
pulling line had to be stopped and backed up. All this was
time consuming. A device as unwieldy as the cone was
bound to be improved upon. Roy Baptist, son of William,
reported the following incident:

One day pa was bossing a big pullboat outfit when a
colored fellow said to him quietlike, "I done figured
out, Mr. Baptist, it'd take me less'n three minutes
to ax out a point on that log that'd serve just like
your big cone" (Holmes, 1954:104).

Despite Holmes's claim to the contrary, the cones were
quickly abandoned in favor of "sniping," as making a point
on the end of a log was called (Figure 15). With this,
pullboating was a complete success, as logs could be
efficiently dragged year-round from distances approaching
a mile.

Pullboat Logging

Equipment required in pullboating consisted of the
pullboat, dredge boat, quarterboats, towboat, and small
boats, such as skiffs and pirogues (Figures 16, 17, and
18). During the industrial period, barges were rarely
used in log transportation. When used, a crane for lifting
the logs onto the barges was required (Figure 19).

In operation, the pullboat was securely anchored
at the set by cables running to piling, or ashore to trees
or stumps. Pilings were used in lakes and wide streams,
whereas trees or stumps were used along canals and narrow
streams. The runs were laid out in fantail pattern
(Figure 20). After the set was selected, the superintendent
Fig. 15. Sniped log being loaded aboard barge. Blind River, St. James Parish, 1959.

Ervin Mancil
Fig. 16. Opdenweyer-Fischer pullboat outfit on Amite River in the early 1900's. Note the two-storey quarterboat, the waterman and the boom for holding logs until they are made into rafts.

*Josephine Devall*
Fig. 17. Bowie Lumber Company, Ltd., quarterboat and dredge boat, *circa* 1903-1904.

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Fig. 18. A two-drum pullboat. Notice the boat in slip at the right. Date unknown.

United States Forest Service
Courtesy Louisiana Forestry Commission, 1970
Fig. 19. Pullboat and floating crane used to load logs onto the barge. Blind River, 1959.

Elmore Morgan
Fig. 20. An actual pullboat logging layout in Louisiana. The word "run" was found to be used far more frequently than "road" among interviewees.

_Bryant, 1923:234_
or woods foreman went to the outer end of the first run, some 3,000 to 5,000 feet away, depending on the size of the pullboat. He blazed a tail tree where the sheave (Figure 13) was to be placed for the first run. He then stepped off a distance of about 150 feet around the periphery of the area enclosed, selected the nearest suitable tree, and blazed it so the fellers would not cut it. He proceeded in this manner around the area to be logged from the set. The runs were about 150 feet apart at the back because logs could not be economically and practically sidelined, that is, pulled into the run from the side, for a distance greater than 75 feet. Sidelining consisted of attaching one end of a cable to a log and the other end to the buckle on the pulling line. The log could then be pulled to the run, where the cable was detached, and the log attached by another chain or cable, a few feet in length, to the buckle (Bryant, 1923:233-234).

After the location of the sheave was determined, each run between the pullboat and sheave was cleared of all debris, trees, and stumps. Stumps were cleared with dynamite (Figure 21). Normal widths of runs were six to eight feet. The sheave was then rolled to the tail tree, where it was firmly anchored. Five-hundred-foot sections of messenger cable (or, in the case of three-drum pullboats, the 3/8-inch cable) were pulled through the run, joined together, until a continuous line extended from the pullboat, through the sheave, and back to the pullboat.
Fig. 21. Blasting an obstruction from a pullboat run. Fernwood Industries, Inc., in Blind River area, 1959.

Elmore Morgan
As explained previously, the power cable could then be pulled to the back by messenger cable. The pullboat was then ready for operation.

Felled trees had to be prepared for pulling. Since in pullboating, numerous stops and backups of the power line were required, tongs came unfastened from logs, therefore requiring resetting. Tongs, then, could not be successfully used. Two- or two-and-one-half-inch holes were bored with a hand auger on the opposite sides of one end of each log to a depth of about 10 inches (Figure 22). Two-inch augers were most commonly used. Iron plugs, or "puppies," were then inserted into the holes. Plugs were 12 inches long, cylindrical in shape, and connected to each other by two feet of chain. The end of the log was also snipped, that is, rounded off. It was then ready for pulling.

If the log lay away from the run, considerable maneuvering was often necessary to sideline it to the run. The cable between the pulling line and the log did considerable damage to unfelled trees by cutting into them. Even if the route was clear between the log and pulling line, as soon as the pulling line moved forward, the log was forced to follow a curving path. Though not as damaging as overhead skidding, the ground method did damage and destroy much young growth. Up to six logs, depending upon their sizes, were assembled at the main or pulling cable. When a load was bunched and attached to the main
Fig. 22. Boring hole with an auger. Blind River, St. James Parish, 1959.

Elmore Morgan
cable, a go-ahead signal was given by the whistle boy to
the engineer or operator on the pullboat. Signals were
transmitted by jerking on a piece of telephone wire
stretched between the pullboat and the back of the run.
Considering the distance involved, transmitting signals
was quite a trick in itself. Bunch after bunch of logs,
dragged along the same route across soft ground, resulted
in mud-and-water-filled ditches that often were six to
eight feet in depth, running the full length of the run.
As previously mentioned, when logs hung up on obstructions,
such as buried logs and stumps, dynamite was used to blast
the run clear. Most of the runs, even the oldest ones, are
still quite soft, and thus dangerous to the unwary
pedestrian.

When one run was pulled, the power or main line
was shifted to the adjacent, unpulled run. The sheave was
left in place, and another one placed at the tail tree of
the new run. After the first run was pulled, the messenger
and power lines never occupied the same run. This was done
so that the messenger would not get in the way of the power
line, thereby reducing damage to and breakage of the cables.
Also, a substantial amount of time could be saved. By the
time the last logs from the first run were pulled in, light
cable had been taken out along the new run, passed through
the sheave, and carried over to the first sheave. When
ready to shift, the power cable was disconnected from the
messenger, which was then attached to the light cable.
Meanwhile, the power line was wound onto its drum so that all of it was at the pullboat. The end of the messenger was then pulled by the light cable being wound onto its drum through the new sheave and run to the pullboat, where it was attached to the power cable. The power cable was then pulled by the messenger to the back, and was ready to begin bringing in logs from the new run, while the messenger remained in the preceding run.

At the set, the logs were pulled into the water (Figure 23), where the waterman disconnected and maneuvered them to the rafting area (Figure 24). On canals, a slip or pocket was dredged for log storage and raft making. Even on streams, companies preferred to dredge a dead-water area for log storage (Figure 25). Along lakes and streams where a dead-water area was not dug, booms (Figure 16) were used to hold the logs until they were made into rafts.

Along canals and some streams, slips or pockets were dredged not only for the pullboat and log storage, but also for the quarterboats and shop boats (Figure 18). Quarterboats usually were two-storey affairs constructed on a barge. The lower deck housed the kitchen, dining area, and sometimes the foremen's and engineer's quarters. The upper deck was the crew's quarters. On many operations, small quarterboats housed the foremen and engineer. Two or more barges with house-like structures on them contained machine shops, tools, replacement parts, and sometimes a
Fig. 23. Log hitting the water on a Des Allemands Lumber Company, Ltd., operation, circa 1903-1904.
Fig. 24. Pullboat scene with waterman at right maneuvering logs, circa 1903-1904.

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Fig. 25. Dredging a dead-water area, *circa* 1903-1904.

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small store where sundry items such as tobacco and soap could be purchased (Figure 26).

Pullboating began at the upper end of canals and small streams. This was the practice after it was discovered that so much soil and debris were dragged by the logs into the waterways that they became clogged and had to be redredged. This clogging usually presented no problem if the logging was started at the head of the waterway. A ramp of logs was constructed at the "deck," or "dump" (place where the logs entered the water), in order to reduce the amount of debris and soil entering the waterway. 3

Railroad Logging Development and Operation

In railroad logging, a system was used whereby the cable for pulling logs was rigged between two trees (Figures 27, 28, 29, 30, 31a, and 31b), as described for Butters' original invention. At later dates, 1908 and afterwards ("Loading and Skidding," 1931:85), many operators used a portable tower in place of the spar tree. A system

3 The foregoing discussion of pullboating was compiled from many sources, as follows: Bryant, 1923:71, 233-237; Horn, 1943:120-121; Kantner, 1955:12-14; "Pull-Boat Logging," 1955:62; Watson, 1906:44-46; Williams, 1908:3; Winters, 1938:64. Numerous interviews were also carried out, the most rewarding of which were with Burris, February 11, 1961; Cotton, August 12, 1957; Gaudet, July 11, 1958; Kent, March 7, 1959; Richardson, April 29, 1958; Windecker, August 2, 1959. Finally, the author personally observed Louisiana's last pullboat operation, by Fernwood Industries, Incorporated of Fernwood, Mississippi, in the Blind River, Louisiana, area, 1961.
Fig. 26. Scene on Blind River, St. James Parish, in 1958.

Ervin Mancil
Fig. 27. Arrangement of the lines on a Lidgerwood combination skidder and loader.

Bryant, 1923:217

Fig. 28. Method of attaching blocks and arrangement of guy lines.

Bryant, 1923:219
Fig. 29. Overhead skidder and loader, Bowie Lumber Co., Ltd., circa 1903-1904.

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Fig. 30. Tall tree, *circa* 1903-1904. This is the only photograph of a tall tree located.

*Department of Geography and Anthropology, Louisiana State University*
Topping a cypress tree for use as a spar tree in Louisiana.
Date unknown.

Bryant. 1923:218
of movable blocks (Figure 32), operated by the donkey engine, was strung on the cable in such a way that the block ("carriage," or "bicycle," as it was called) could be moved back and forth between the two trees. In this manner, there was a rehaul. The carriage was moved to the back, logs attached to a cable suspended from it (Figure 30), then by reversing direction of the drum, the logs were pulled to the head. Then the carriage was returned (re­hauled) toward the back for another load.

In swamp railroad logging, the distance pulled was usually no more than 600 to 800 feet. A series of spur lines (Figure 1) was constructed more or less parallel to each other from the main railroad. These spurs usually were 1,200 to 1,600 feet apart. The skidder was moved out along each of them in turn. From any given spur, pulling was done halfway between it and the adjacent spurs. In this way, "clean" logging was possible in that all timber between spurs could be reached. Plate VI shows the layout and sequence of a logging operation in southern Tangipahoa Parish.

**Railroad Logging**

In logging by overhead cableway skidder,\(^4\) selling techniques were the same as described above. Also, cypress

\(^4\)This machine was given various names, including cableway, cypress, high-ball, Lidgerwood, overhead, railroad, steam, suspended, and swamp skidder, or some combination of the above names.
Fig. 32. Skidder with steel boom, or tower, showing the carriage. Louisiana Cypress Lumber Company, Inc., Ponchatoula, 1950's.

Standard Oil of New Jersey
PLATE VI
RAILROAD LOGGING
SEQUENCE IN
TANGIPAHOA PARISH

Louisiana Cypress
Lumber Company, Inc.

1936 Tract & Year Logged

Logging RR & Spurs

Source: Claude H. Lindsay, 1956
trees usually were girdled for reasons previously mentioned. As this was a "high-lead" (above ground) operation, snipping and boring were unnecessary as there was no digging into the mud or striking of buried obstructions. Because there was never a need to back up, tongs were used because they did not come loose as in pullboating.

Railroad construction was begun by clearing a right-of-way of all obstructions (Figures 33 and 34). If the ground was solid enough, a dirt road bed (Figure 35) was thrown up for main lines and spurs. Frequently, swampy conditions required construction on either piling (Figures 36 and 37) or, a crib-work of logs (Figures 38, 39, and 40). Such construction was expensive, normally running between $9,000 and $15,000 per mile of main line (Bryant, 1923:311, 319; Mattoon, 1915:15). The dirt and crib-work roadbeds were particularly effective in blocking drainage because usually they were constructed across shallow depressions and drainage ways without benefit of bridging.

If surface conditions permitted, spur lines were of dirt construction. However, the surface was often so soft as to preclude use of dirt as ballast. In such cases, spur lines were most frequently constructed of dunnage, which is waste material such as bark, shavings, sawdust, and slabs. When waste was scarce, a special machine, known as a "hog," chipped large slabs, limbs, and trash trees into dunnage. The material was hauled in "dunnage"
Fig. 33. Cleared right-of-way for logging railroad. White Castle Lumber and Shingle Co., Ltd., *circa* 1903-1904.
Fig. 34. Cleared right-of-way for logging railroad. 
Louisiana Cypress Lumber Company, Inc., 
Ponchatoula, 1950's.

C. W. Witbeck
Fig. 35. Logging railroad scene about 1904. Note dirt roadbed.

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Fig. 36. Pile driver at work. White Castle Lumber and Shingle Company, Ltd., circa 1903-1904.

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Fig. 37. Railroad constructed on piling, *circa* 1903-1904. Locomotive is Bowie Lumber Co., Ltd., No. 66.

E. James Kock, Sr.
Fig. 38. Cribwork roadbed. Some track-laying equipment is shown. Louisiana Cypress Lumber Co., Inc., Ponchatoula, 1950's.

G. W. Witbeck
Fig. 39. Scene along a cribwork roadbed in the 1950's.
Louisiana Cypress Lumber Co., Inc., Ponchatoula.

C. W. Witbeck
Fig. 40. Cribwork roadbed. A group of sightseers on an excursion conducted by Louisiana Cypress Lumber Co., Inc., Ponchatoula, in the late 1940's.

Hubert Lindsay
oars, whose sides could be lifted from the bottom (Figures 41 and 42) for easy dumping. Often the surface was a little too soft to place the crossties directly on the ground, and a kind of "corduroy" (Figure 43) road was made of small trees. The ties were then placed on the poles and the dunnage tamped beneath them as ballast. Under very soft conditions, spur lines had to be constructed on piling or crib-work, which were more expensive than dunnage.

Reportedly, some main lines were constructed of dunnage, but this was never verified by other than one informant (Windecker, August 2, 1959). This individual said that the canal running between Strader and a point near the juncture of Bedio Creek and Tangipahoa River in southern Tangipahoa Parish was formerly a dunnage road that was destroyed by fire in 1915. The dunnage was supposed to have been some five-to-six-feet thick. The entire area has subsided and become covered with water to such an extent that the logging pattern, that is, whether pull-boat or railroad, is not discernible on aerial photographs made in 1950. That this was a dunnage roadbed is doubtful because of the distance involved (some nine miles), and crib-work construction was much sturdier for the heavy equipment used on main lines. Dunnage was used only by very lightly loaded equipment. It should be added that in all other cases where this informant could be checked he was found to be very reliable. Perhaps the only significance to be attached to this roadbed's burning, and so
Fig. 41. Loading a dunnage car (1950's), Louisiana Cypress Lumber Company, Inc., Ponchatoula.

C. W. Witbeck
Fig. 42. Dunnage being dumped (1950's), Louisiana Cypress Lumber Company, Inc., Ponchatoula.

G. W. Witbeck
Fig. 43. Corduroy roadbed under construction in a Livingston Parish gum swamp, 1945. This is on a truck-logging operation, but the roadbed preparation is essentially the same as that for railroad logging.

Louisiana Forestry Commission
creating a canal, is in terms of whether the swamps and dunnage ever get that dry. This is most unlikely.

Railroad logging witnessed a few more changes in basic equipment than did pullboating. The first skidding engines were mounted on flatcars, placed on short spurs (Figure 44) at each set (Williams, 1908:11). However, some photographs (Figure 45) indicate that some skidders were placed on piling alongside the tracks, an older method that was superseded by the short spurs running at right angles to the tracks. In 1908 the portable steel tower (Figure 46) was invented ("Loading and Skidding," 1931:85). It began to replace the spar tree. Advantages of the portable tower were that the skidder stayed on the tracks, thus permitting much faster changing of sets, and assuring that all rigging was in proper alignment. This decreased wear and tear on blocks and cables. Some combination skidders and loaders, and loaders, were so designed as to permit the passage of cars underneath them (Williams, 1908:11-12). The empty cars were backed beneath them until only one car remained in front of the machine. Then, when a car was loaded, the entire train was moved forward by means of a cable until another empty car was in place (Figures 47 and 48).

The stationary skidders (i.e., any skidder, whether of tree-rigged or steel-tower type, that had to be set off the tracks) pulled in from all directions, thus leaving a radial pattern somewhat similar to pullboating. The lighter
Fig. 44. Skidder on a spur at right angle to the railroad, which is off the photo in the foreground. Circa 1903-1904.

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Fig. 45. Bowie Lumber Company, Ltd., skidder-loader at work, circa 1903-1904. The machine is located on piling.

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Fig. 46. Steel-towered skidder at work in the 1950's. Louisiana Cypress Lumber Company, Inc., Ponchatoula.

C. W. Witbeck
Fig. 47. Two-deck loader, 1950's. Empty cars pass through the lower deck when the rails at front and rear are lowered and the derrick at right is raised.

C. W. Witbeck
Fig. 48. Cars in foreground have been pulled, one at a time, through the loader (in the background) and then loaded. Date: 1950's.

C. W. Witbeck
models pulled logs in from 600 to 800 feet on both sides of the spurs. Heavier models could skid logs for distances up to 2,000 feet (Mattoon, 1915:12). Because the latter were rarely used in Louisiana's industrial period, almost all spurs in this state are between 1,200 and 1,600 feet apart. The strictly portable models of railroad skidders pulled in almost parallel lines at right angles to the spurs (Figure 49). This was possible because they could be moved and set up again very quickly. The setup time was eventually reduced to 15 minutes or less (Hecker, 1931:278).

**Pullboat Versus Railroad Skidder**

In pullboat and railroad logging, the fellers' techniques of traversing the swamps and felling trees differed in no way from those accompanying the float method. In most operations, the swampers now worked year-round and, in the case of railroading, normally rode handcars or the trains daily into and out of the swamps (Figures 50 and 51). In industrial lumbering the essential differences between old and new methods brought greater damage to uncut trees, changes in vegetation, changes in water levels (because of canals and railroad beds), the development of large-scale industry, urban changes, and with most operations, year-round work for all involved.

Whether a pullboat or railroad skidder was used was determined primarily by water conditions. If natural waterways were available, most operators preferred to use
Fig. 49. Logs piled along Louisiana Cypress Lumber Co., Inc., railroad in the early 1950's. Skidder is located at the lower right of photograph.

Standard Oil of New Jersey
Fig. 50. Swampers riding the water tank car into the swamps. Louisiana Cypress Lumber Company, Inc., Ponchatoula, 1950's.

C. W. Witbeck
Fig. 51. Swampers coming out on handcars after a day's work, Louisiana Cypress Lumber Company, Inc., Ponchatoula, 1950's.

C. W. Witbeck
the pullboat. Canals were frequently dredged (Figure 52) in order to get to the timber, but dredging was often very expensive, especially if the canal passed through a region with numerous large stumps. Mattoon reported that the cost of dredging canals had brought ruin to many operators (1915:26). Stumps were blasted out with dynamite (Figure 21). The farther the timber lay from natural waterways, obviously the greater was the cost of canal dredging. Canals usually were 30 to 50 feet wide, and six to eight feet deep. If the timber was remote from natural waterways, and if the company owned railroad logging equipment, and it it was deemed that railroad construction was cheaper than canal dredging, then it would be decided to log by rail. Most large companies owned both pullboat and railroad logging equipment. Sometimes the preferred method of logging would not be used because the equipment was in use elsewhere. If the timber was accessible by water, without extensive dredging, pullboat logging was generally considered to be cheaper than railroad logging.

**Pullboat and Railroad Patterns**

Pullboat, as opposed to railroad skidder, patterns can be distinguished in four ways:

1. Spurs are absent in pullboating.
2. Because the railroad skidder was an aerial operation, logs did not dig deep ditches, or "runs."
Fig. 52. Dredge boat in a freshly dug canal, circa 1903-1904.

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3. Main lines will be present in the railroad skidder system.

4. At most pullboat sets, a man-made dead-water area will be present.

The foregoing criteria can be used provided subsidence and sedimentation have not obscured the pattern.

Railroad logging was more efficient than pullboating in that more logs could be snaked in from the woods each day. It also was more efficient in destroying young growth and potential seed trees. Damage resulted from moving elevated logs swinging against unfelled trees (Figures 46 and 53). Most skidders pulled the logs in at a speed of about 600 feet per minute.

In a very few instances, a combination of railroad and pullboat logging was used (Gaudet, July 17, 1958 and Landry, August 1, 1958). The railroad skidder would be mounted on a barge. Since a tail tree, along with the spar tree or steel boom, was used, the pattern left on the landscape is similar to railroad logging without the spur lines.

Dike or Levee Float Logging

Toward the end of the cypress lumbering era in Louisiana, an industrial method of float logging was devised. As mentioned somewhat earlier, the industrial version of diking or leveeing the area to be logged was first used in Arkansas in 1917.\(^5\) Insofar as this writer

\(^5\) The idea was patented (United States Patent Number
Fig. 53. Area logged by skidder in the early 1950's. Standing trees were killed by the operation. Most of the bushes are willows. Louisiana Cypress Lumber Co., Ltd., Ponchatoula.

Standard Oil of New Jersey
knows, no company other than Harless Lumber Company used it during the industrial period in Louisiana. The area to be diked involved 1,000 to 2,500 acres. A dragline, operating on a mat of logs or from a barge if the levee ran along a navigable waterway, threw up a levee to a height of 36 to 48 inches (Lucas, 1957:53-54) (Figure 54). Often, because the soft levee would spread and subside, more material had to be piled on. Once the levees were constructed, rainfall and large pumps (Figure 55) filled the pond to the desired depth of 28 to 36 inches. The canal dredged to obtain material for levee building was used to bring quarterboats, towboats, and barges in from navigable waterways.

Before or during the time of dike building, float roads were cut from what was to be the log ponding area to the back of the area involved. Several main float roads were cut, spreading out fan-like from the log storage pond (Figure 56). Short swaths, or spurs, were cut at intervals of a few hundred feet from the main float roads. This was done so that all of the pond was accessible to small boats.

Once the area was flooded, felling proceeded in the time-honored float-logging fashion (Figures 57 and 58). The trimmed and topped logs were brought to the storage area (Figures 59 and 60), where they were made into rafts or loaded aboard barges (Figures 61, 62, 63, and 64). If

2355813) in 1944 by Thayer T. May of May Bros., Incorporated (Lucas, August 17, 1959).
Fig. 54. Scene in 1959 at the site of May Brothers, Inc., levee float logging operation in St. James Parish. Dragline used for levee construction is on a barge at right. The crane used for loading logs onto barges is at the left on the levee. Canal was created when material was dredged and piled up to form the levee.

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Fig. 55. Pumps used to flood the diked logging area of May Brothers, Inc., 1959. Capacity of each of the four pumps was 20,000 gallons of water per minute.

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Fig. 56. A photograph of a map drawn on brown wrapping paper and used by Auguste O. Landry, Chegby (Lafourche Parish). The map shows a levee float logging layout. Part of Lake Boeuf, Lafourche Parish, is shown in the lower right corner. This work map is in this writer's possession.
Fig. 57. Fellers and pirogues, 1959. The fellers paddle into the swamp, carrying tools, lunches, and drinking water in the pirogues. May Brothers, Inc.

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Fig. 58. Tree, cut with a chain saw, is beginning to fall. May Brothers, Inc., 1959.

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Fig. 59. String of ninety logs being towed through a run to the log pond. May Brothers, Inc., 1959.

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Fig. 60. Boat used to tow logs to the pond, May Brothers, Inc., 1959. This type boat is constructed of steel and powered by either an A-Model or B-Model Ford engine.

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Fig. 61. Log Storage area, May Brothers, Inc., 1959.

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Fig. 62. Pondman, whose duty is to move logs within range of the loading crane. Note the rubber waders that he is wearing. 1959.

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Fig. 63. Grab of loading crane with a load of logs, which will be swung over the levee and placed in a barge, 1959.

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Fig. 64. View of log storage pond, loading crane on the levee, and barge in canal being loaded. 1959.

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the logs were to be barged, they were bucked to the proper length when felled (Landry, August 1, 1958; Lamaison, July 9, 1960; Denver Harless, July 14, 1960). This method of logging was practiced only when the amount of timber per acre did not justify pullboating or railroad logging.

Diking was used by Harless Lumber Company (Denver Harless, July 14, 1960) and Joseph Rathborne Land and Lumber Company, Inc., (Kerr and Morgan, 1953:46), and May Bros., Inc., which in 1963 was the last to use this method (Gunter, July 10, 1967). It was found to be too expensive for the amount and size of timber available.
AN HISTORICAL GEOGRAPHY OF INDUSTRIAL CYPRESS LUMBERING IN LOUISIANA

Volume II

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

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CHAPTER VI

PHYSICAL AND CULTURAL CHANGES

Industrial cypress logging left marks upon the landscape, some physical, others cultural. Logging activities prior to the industrial era left few physical marks and no cultural ones. Even the physical scars, crevasses and the removal of readily accessible cypress, were far less notable than those of the industrial era, and, in fact, were largely obliterated by this era and its settlement and development.

Physical Changes

Railroad Logging.—It is probable that the first enduring changes that came with steam-powered logging, other than the removal of cypress, were associated with railroads. This is because it was probably not necessary to dredge pullboat canals before 1891 or 1892, the date of the advent of railroad logging.\(^1\) Railroad beds blocked drainage, thus deepening some swamps to the point where trees could not regenerate. Not only was the vegetation affected, but wildlife, also. Accordingly, neither is now present in its former abundance (Blakesley, July 14, 1957; at least, no record of canals older than the advent of railroad logging was obtained from literature or informants.)
Bourgeois, August 17, 1957; Cotton, July 2, 1958; Kramer, June 10, 1956; Richardson, April 29, 1958; and Weinberger, June 3, 1956). One informant, who asked to remain unidentified, said that prior to railroad pullboat logging, the swamps had hard bottoms. He believes that steam logging broke through the hardpan, and the result was soft-bottomed swamps. This change possibly could have occurred, since it is logical that fine sediment and organic matter would have formed a kind of hardpan. Too, the destructive railroad skidders so denuded the land that today little marketable timber is available from areas so logged.

The logging tramways still exist, frequently blocking drainage. Some few of the dirt roadbeds are used as local highways and streets (Figures 65, 66, and 67). Most, however, do not run to the proper places for such use. Today, hunters and others going into swamps follow them because of the firmer footing provided (Figures 68 and 69).

The amount of railroad steel, ties, and rolling stock left in the swamps is not known. In the Manchac swamp area, two skidders and a camp car were left by Joseph Rathborne Land and Lumber Company, Inc. (Witbeck, April 17, 1970). Near Lake Verret is an abandoned

\[2\] Several other informants, when presented with the idea, felt that this could have happened. It does seem, however, that this could only have occurred along pullboat runs.
Fig. 65. Shell road on old railroad bed at Burton in 1958. Road is maintained by Humble Oil Company.

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Fig. 66. Old railroad bed leading to St. James millsite which is in the wooded area in the background. Road is now used by the sugarcane plantation through which it runs. 1958.

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Fig. 67. Garyville-Northern railroad bed, now maintained by an oil company, off Airline Highway near Garyville, 1960.

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Fig. 68. Garyville-Northern railroad bed at Blind River, 1963.

Hubert Smith

Fig. 69. Timberton railroad bed in 1959.

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locomotive (Ford, April 18, 1970). In a few places the railroad was left intact. The abandonment of such equipment and railroad steel occurred toward the end of the industrial era when there were virtually no markets for them. Such relics of a bygone era are not really widespread, but occasionally may be found in more remote areas. The easily accessible iron and steel were collected and sold to scrap dealers, who, in turn, sold it to the Japanese in the 1930's.

**Pullboat logging.**—The use of the pullboat, though less destructive, still resulted in marked alterations. Some former pullboat areas have been cut again for hardwoods since the cypress was removed. Because of the deep ditches dug in the runs, pullboat patterns still show quite conspicuously, and trees are unable to reestablish themselves in the soft runs. At the set, a slip or deadwater area is usually found. Dredging of canals affected drainage; spoil piled along one side of a canal blocked normal drainage on that side, but caused increased drainage on the opposite side (Figures 70 and 71). Spoil placed on both sides of the canal resulted in blocked drainage of the entire swamp. Certainly, canal dredging induced changes in vegetation and wildlife. Where the water was impounded, the natural regeneration of trees was inhibited, while the increased drainage resulted in heavy growth of vines and weeds. Only the more competitive
Fig. 70. Dredge boat at work, circa 1903-1904. This shows that spoil was piled quite high.

E. James Kock, Sr.
Fig. 71. Canal dug by Fernwood Industries, Inc., in the Blind River area. Notice spoil on the left and the site of pullboat operation in background. 1961.

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trees, such as cottonwood, sycamore, and willow, were able to establish themselves. Thus, the cypress-tupelo gum climax was largely replaced (Hugh C. Brown, August 6, 1960). Many informants complained of a decrease in wildlife in the deepened swamps, and thus of losses of income from trapping and a decline in sport hunting.

The logging canals still exist (Figures 72, 73, and 74) except in the short sections where they have been filled in due to later activities, such as urban developments and highway construction. Many of the canals serve in drainage systems and as small-boat and barge navigation channels.

**Float logging.**—Many places, where the original cypress forests were float logged, have since been cut at least twice for hardwoods. Old-fashioned floating did little damage to the vegetation and wildlife. The float trails normally were only eight to ten feet wide, thus destroyed little timber. These trails served a useful function in that they provided boat roads through the swamps for commercial fishermen and trappers. This is not true of the recent diking system, because the levees block much normal drainage, and trees unaccustomed to standing water suffer damage and are frequently killed, despite legal requirement that the levees be broken at normal drainage points when logging is completed. It is easy to overlook slight swales within the swamps and leave the
Fig. 72. Former logging canal serving as a drainage canal in 1958 in St. Mary Parish.

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Fig. 73. Pullboat canal maintained as a drainage ditch in St. James Parish off Airline Highway, 1960.

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Fig. 74. End of the canal at Sorrento millsite. Canal was also used as a millpond. Road at left is on the abandoned railroad bed. 1957.

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levee intact at such spots. In areas, such as Louisiana swamps, where only a few inches difference in elevation becomes very important, the filling of even slightly lower drainageways has important consequences. One authority stated, "... a difference of a few inches in elevation here is often more important than a hundred feet in mountainous country" (Clair A. Brown, 1945:8-9).

**Evaluation of Swamp Changes**

Unfortunately, no one, prior to exploitation of the swamps, noted and preserved information on vegetation and edaphic conditions. Thus, it seems impossible to reconstruct conditions as they existed prior to industrial logging. No literature of value exists on the subject, and informants could not give definitive data. Many could say how deep the water was on a certain section of land in a particular year; often, the exact month and day were given; whether this involved normal swamp water levels could not be ascertained. Nor was enough such information available to plot levels, whether normal or not, across swamps. Very often, conflicting opinions were obtained concerning swamp alterations. All informants agreed that significant changes had occurred. A few said that pullboat and railroad logging were equally destructive; the majority, correctly, stated that railroad

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3The records of a number of drainage boards, the United States Army Corps of Engineers, and the Illinois Central Railroad were checked, all to no avail.
logging was the most serious offender. All agreed, also correctly, that old-fashioned float logging was the least destructive. It should be noted that a number of informants believed swamp-water changes were primarily a result of canal and levee systems constructed for other reasons during and soon after industrial logging. Certainly, these later systems contributed to the changes; however, since no records were kept, to assign relative responsibility to any particular form of logging or to public works simply is not feasible. Of all the disappointments in the lack of information, and thus inability to draw valid conclusions, the one regarding swamp modifications was felt most keenly by this writer. However regrettable this lack may be, some value is attached to this study in that others will know that such data are not available through individuals or literature.

**Cultural Changes**

The great amount of physical change and the relative unimportance of cultural change associated with cypress lumbering came as a surprise. This writer had preconceived notions based on the impact of Stokes' (1954) dissertation on longleaf-pine lumbering in southwest Louisiana. There, railroad skidder logging was highly destructive but other modes were not. Cultural changes were tremendous, with the creation of sawmill towns and their ultimate obliteration. The assumption that great
similarities would be found between pine and cypress lumbering was quite erroneous.

Many companies disposed of their cutover timberlands. Those that retained their holdings frequently have been rewarded with the discovery of petroleum and natural gas, and at least one⁴ sells brine from a salt dome to a company producing chlorine (McLaure, July 26, 1958). Adding to the income of the holders have been timber sales and trapping leases. The regrowth of timber has been best in areas that were float logged. Pullboated areas have a better timber regeneration record than those logged by railroad skidder.

People

One series of questions on the check-list (Appendix A) involved workers, skilled and unskilled, their race or nationality, where they were from, and whether they stayed or moved elsewhere when lumbering ceased. The information acquired is summarized in the following paragraphs and the succeeding chapter, which deals with the daily activities of cypress workmen, where they resided, and other related data.

Newcomers to Louisiana

With the exception of the Italians in the city of

⁴United Land Company, Inc., which has control of the land associated with McElroy.
Harvey (Howze, August 8, 1958), no large numbers of outsiders came to Louisiana specifically for cypress lumbering and remained after the decline of the industry. Several families of Italians, as in the case of Harvey, mostly from Chicago, went to Bowie and Des Allemands (Price, August 2, 1960). Those who came to Bowie removed to Raceland or New Orleans when the mill ceased operations. Most of the Des Allemands Italians remained there. A few Puerto Ricans came to Bowie, but all except one family later moved away, reportedly to New Orleans (Price, August 2, 1958). Also, a few Germans came to Harvey, and stayed within the area after the close of the cypress industry (J. G. Boudreaux, Sr., August 9, 1958; Howze, August 8, 1958).

Almost all of the Finns employed at Lutcher (Elder, August 3, 1958; Hoover, July 27, 1958), Timberton (Hoover, July 27, 1958), and White Castle (Elder, August 3, 1958) moved on. It may be added that the Finns were employed as skilled workers. A few Swedes remained at Lutcher and Plaquemine (Gaudet, July 11, 1958; Hoover, July 27, 1958). No one seemed to know where the Finns and Swedes went when they left the sawmill towns. So many Texans worked at the sawmill in White Castle that it became known as the "Cowboy Mill" (Gaudet, July 19, 1958). Apparently, quite a few of the Texans remained in the area.

With the exception of Harvey and Des Allemands, most outsiders were Northerners in the skilled-labor,
office force, and sawmill-owner groups. Their numbers were never great. A few remained, but most moved on to other lumbering areas. Quite a few of the Northerners were affiliated with the Republican party, but their influence in local politics was minimal. In total, the outsiders involved in cypress lumbering were too few in number to have much influence. Even in Harvey, so many Italians came in to work in other industries, especially in the twenties and thirties, that they lessened the influence of the cypress-induced settlers. Too, in the cypress industrial area, the few outsiders who remained in the area were largely acculturated into the Acadian pattern.

Local Population Shifts

All interviewees were asked questions regarding local movements of people, and the results are in the following paragraph, brief as it is.

Local population dislocations in connection with the cypress industry occurred but tended to be temporary in nature. Louisiana men, usually with families, moved to mill towns. Rarely were other jobs available when the mills closed, so they tended to move elsewhere; often, this was back to their original home areas, which most frequently was a rural location. Only Baton Rouge, Harvey, Houma, Lake Charles, Morgan City, and New Orleans suffered no serious losses of population when the mills shut down,
primarily because the petroleum industry was ready to absorb most of the newly unemployed.

Mill Towns

The aforementioned check-list contained points regarding towns. All informants were asked questions concerning such items as whether a town was old or company-established, date of establishment if it was a new town, what happened when the mill ceased operating, and what facilities and services were available. Much specific data were obtained for some towns—none or very little for others. Each millsite was visited and photographed. Some representative photographs are shown in Figures 75 through 82. Any industry as important as cypress lumbering affects urban growth. It is especially effective in a non-industrial region such as Louisiana was during the period 1890-1925. Even so, cultural changes were less important than the physical ones.

Most towns that became milling sites were already in existence (Plate IV) when the industry located in them. All existing towns, with the possible exception of Baton Rouge and New Orleans, experienced significant temporary growth, normally declining as cypress lumbering decreased.

Classification of Towns

Plate IV shows the location of industrial cypress milling sites, and classifies the sites according to their status before becoming mill towns. Also shown are sites
Fig. 75. St. James millsite in 1959.

Fig. 76. The former office building, now a residence, was the only structure remaining in 1958 at Rhoda, near Morgan City. Building was constructed in the early 1920's.
Fig. 77. Rhoda site in 1958. Area to the left of the abandoned railroad was a small residential area. The houses have been removed. The building showing in the photograph is a recent structure.

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Fig. 78. Abandoned warf and pullboat at the Rhoda site on Bayou Boeuf in 1958.

Fig. 79. Roof line of dry kiln is discernible in the upper center at the Donner site. 1958.
Fig. 80. The Donner site in 1958. The area is badly overgrown and lies in shallow water. The building is the dry kiln.

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Fig. 81. Chacahoula townsite in 1958. A rent house is at the right, and part of the concession house shows at the left.

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Fig. 82. Chacahoula millsite in 1958.

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that were abandoned; in all cases these were towns first established as millsites. Accurate classification is not easy to achieve, and it is likely that this attempt contains errors. Reasons for possible errors are explained in the discussion that follows.

Sources of information for classification of mill towns were informants and a meager literature. It was learned that the expression "there was nothing here before the sawmill came" does not necessarily mean what it says. The same is true of "no town here." In the former case, the expression usually meant that the town was much smaller before than after industrial cypress milling began. "No town here" frequently meant that the site was no more than a hamlet or a line village. Another problem of classification was that exemplified by such places as Garyville and Lutcher. Both "had a settlement" in the sense of being plantations; there was the "big house," overseer's house, farm laborers' quarters, plus the various other buildings that go with such an establishment. It was decided to classify these as new towns because a plantation settlement is not normally considered to have the functions of a hamlet or village in terms of civil and trade activities.

Line settlements, such as St. James and Taft (originally, Taft Station) previously in existence, are classified as preexistent. But, at best it seems that they
were merely small nodal trading points in a discontinuous line village.

Another problem was that many mills were not located in the towns associated with them. Two examples are Atlanta and St. James (Figure 75). The millsites were two to three miles away from these settlements. The Atlanta millsite is some three miles away, at Coochie Brake. Three-room shotgun houses, built in sections at McElroy, were hauled by train to the millsites (J. W. Smith, August 18, 1958; "A Story of Cypress . . .," 1912:41). All workers were brought in from the company's closing hardwood operation at Cottonport, and housed at the millsites. All houses were removed when operations ceased. The influence of the operation upon Atlanta was minimal.

Many of the mill people lived at the St. James and Taft millsites. These sites were given the names of the nearby towns, which were two to three miles away. In these two instances, much local labor was used. No houses remain at either millsite.

The Rhoda situation was quite similar to the cases of St. James and Taft, with the exception the site was given a name independent of that of the nearby town, Morgan City. Almost all of the work force came in daily from Morgan City, about three miles distant. One house remained at Rhoda in 1958 (Figures 76, 77, and 78).

Donner is similar to St. James and Taft in that an antecedent populated place by that name existed, and still
does. However, a town was established at the millsite, about one-half mile west of the preexisting settlement, and was called Donner. A levee was constructed around the cleared swamp where the mill and company town were to be, as well as around the preexisting settlement (Plate VII). The company townsite was abandoned after the mill closed and is now badly overgrown with bushes, trees, and vines (Figures 79 and 80).

**Mill Plants, Locations, and Elements**

In general, the layout of milling plants were quite similar in their overall patterns. Differences existed, of course, and consisted mainly of the presence or absence of various elements. These elements were quite similar (Plates VII, VIII, and IX), though variations occurred. The larger companies tended to have highly integrated plants, consisting of sawmill, planer mill, dry kilns, door, sash, shingle, and window factories, along with dimension-stock factories where such items as mouldings were manufactured. The more integrated mills utilized pieces of cypress down to a size of one-fourth inch thick, four inches wide, and six inches long (Watson, 1906:44). These small pieces made excellent shims for use between train rails and crossties. Larger pieces were converted into items such as bucket, tub, and barrel staves, and cistern and tank stock. All processing facilities other than sawmills, planers, and dry kilns
GARDEN CITY

PLATE VIII

ADAPTED FROM PLAT,
F.B. WILLIAMS CYPRESS CO LTD.,
PLANT NO. 2

1" = APPROX. 120'

B - BARN
C - COMMISSARY
D - DAIRY
K - KILNS
O - OFFICE
P - PLANER MILL
PO - POST OFFICE
R - RESIDENCES
ST - STREET
ST - STORE
SL - SHINGLE AND
LATH MILL
SM - SAWMILL
V - VACANT

188
were referred to as "factories." Smaller operations had fewer of the factories, and often, none. Some did ship the small pieces of cypress to plants equipped to utilize them.

Most millsites had corrals for horses and mules. These animals were used for pulling dollies and wagons loaded with lumber, shingles, and other products to drying areas, and later, to loading points for shipment.

Logs were stored in ponds or streams (Figures 83, 84, and 85). Many companies located on streams preferred to dredge a slip for log storage. Some, however, stored the logs along stream banks in rafts. In such cases, a boom was constructed at the logway so as to keep a supply of logs immediately at hand (Figures 16 and 86). The rafts were moved to the booming areas as the need arose. At some sites, such as Chacahoula, Donner, Gibson, Sorrento, and St. James, canals were dredged from nearby streams to the millsites. The end of the canal normally was enlarged to form a log storage area, while the canal served as the source of water. At Donner the canal was also used to bring in rafts of logs from the company's pullboat operations. In this regard, conflicting statements were obtained concerning Sorrento. The company had been located at Head of Island prior to establishment at Sorrento. The

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5 A boom used for log storage consisted of piling driven about 20 feet apart into the stream bottom. Heavy planks or cables were placed between them at the water line, thus forming a pen.
Fig. 83. Bowie pond and sawmill, *circa* 1903-1904.

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Fig. 84. Cypress and hardwood logs stored in Bayou Plaquemine awaiting movement to mills, 1928.

United States Forest Service
Fig. 85. Rafts of logs on Bayou Teche, circa 1903-1904. It is said that during the industrial cypress lumbering period, one could walk (on the rafts) from New Iberia to Morgan City without getting his feet wet, except at bridges and wharfs.

Department of Geography and Anthropology, Louisiana State University
Fig. 86. Exposed piling are remnants of a boom on Bayou PLAQUEMINE near Indian Village. 1958.

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company definitely used pullboats and moved logs to the mill by water at the former location. It may be that the canal at Sorrento was used for such activity in the early years, and then abandoned. From what informants said, toward the close of operations (1921) at Sorrento, all timber was logged and transported by rail (Devall, June 10, 1956; Kramer, June 10, 1956; and Opdenweyer, May 3, 1956).

Most millsites were located either on navigable waterways or near enough for the dredging of canals to be feasible. Those definitely not serviced by navigable water were Blanks, Chacahoula, McElroy, Ponchatoula, St. James, and Timberton. Uncertainty exists in the cases of Burton, Morley, and Sorrento.

Obviously, early lumbermen, some of whom became industrial operators, located on navigable waters when floating was the only means of logging. Only a few industrial sites were located where navigable waters were not present. Most mills shipped by both rail and water if both were available. The only site that did not have a rail connection was Head of Island. Lack of this facility for shipping finished products was the primary reason for the mill's relocating in Sorrento. Morgan City never received

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Mill sites known to have utilized railroad logging methods only were: Atlanta, Blanks, Borgnemouth, Chacahoula, Crescent, Garyville, McElroy, Melville, St. James, Taft, Timberton, and Vacherie. Of the foregoing, Borgnemouth, Crescent, Garyville, Melville, and Vacherie were also on navigable waterways.
logs by rail (Cotton, July 2, 1958) in spite of the presence of a railroad.

Of all the original sawmills, only one, the Garden City plant, remained intact in 1963 (Figure 87). It was operated by a latecomer to the lumbering industry, and operations ceased in 1963. The only site still in operation is at Ponchatoula. The original band mill has been replaced by a circular saw with a much lower daily capacity (Figure 88). The last cypress logs were processed at Ponchatoula in early 1956 (Hubert Lindsay, May 4, 1956). Since that date, hardwoods and pines have been milled. Figures 89 through 96 show two millsites during and after industrial logging. These are rather typical of the industrial millsites in new towns.
Fig. 87. Aerial view of Garden City mill and drying yards. U.S. Highway 90 passes between the mill and yards. Bayou Teche is at the lower right. Note slip with barge load of logs. Circa 1955.

George C. Lucas
Fig. 88. Louisiana Cypress Lumber Company, Inc., mill at Ponchatoula in the 1950's. The only mill site still in operation in 1970. It is now the Fremont Lumber Company.

C. W. Witbeck
Levee; Double Band Sawmill Dry Kilns Lumber Sheds Planing Mill

Fig. 89. Panoramic view of Bowie Lumber Company, Limited, Boxie, Louisiana, about 1903-1904.

American Lumberman
Fig. 90. Scene of part of the lumber drying years and residential area in Bowie. About 1903-1904.

American Lumberman
Fig. 91. The only residence remaining at Bowie in 1960. A building now used as a barn appears at the right.


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Fig. 92. Building, one of three remaining at Bowie. Used as a barn in 1960. Lumber drying yards were located at the left.

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Fig. 93. The former school house at Bowie. Used for hay storage in 1960.

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Fig. 94. White Castle Lumber and Shingle Company, Ltd., drying yards and sawmill. About 1903-1904.

American Lumberman
Fig. 95. View of the White Castle Lumber and Shingle Company, Ltd., site in 1959.

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Fig. 96. Trees mark the railroad bed leading to the millsite at White Castle, 1959.

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A vast majority of those who worked in the cypress swamps and mills expressed considerable nostalgia for the "good old days." In view of the hard physical labor, long hours, and low pay, this attitude is surprising. The workmen's major complaints did not involve their own privations, but that many companies paid little or no taxes—usually none, all too often failed to support schools, road construction, and other services and utilities. While removing a non-renewable resource, few left anything behind in the way of opportunities for local people.

Why the nostalgia? Certainly, some of this represents reaction to the rapid changes that have occurred within society in general in the last few decades, but this is beyond the scope of this work. Aside from that, it is likely the people realize they were involved in the making of important local history—a history that cannot be repeated. Also, it makes one feel important when he was part of a big operation, and industrial cypress lumbering was big, both locally and regionally. It is worth remembering that this was the first significant manufacturing activity in Louisiana, and these people involved
in the industry helped remove and manufacture something that is gone forever from a commercial point of view. In addition, there was a feeling of comradeship as well as physical competition, and the satisfaction of jobs well done. "I" or "we" "did this" or "did that" was expressed by everyone, and with pride.

The foregoing was expressed by whites. Regrettably, this writer never had a rewarding interview with a black person. Certainly some Negroes may not share the views of the whites.

In discussing the workers and their lives, it is both convenient and logical to do so by separating them into millmen and woodsmen categories even though they often were residential neighbors.

**Millmen**

Most of the white-collar and highly skilled positions within mills were held by transient Northerners. In general, less skilled jobs were manned largely by local whites, with the unskilled positions held by both blacks and whites from local areas. Variations on the foregoing occurred in some mills, with some skilled labor as blacks, or all unskilled positions held by blacks (Barker, July 26, 1958; Bourgeois, August 17, 1947; Hegt, July 6, 1957; and Walters, August 1, 1957).

The work day for millworkers usually began at six o'clock in the morning and was finished 11 to 12 hours
later, with six a.m. to six p.m. being the normal (Norgress, 1947:1032). Most mills operated six days per week, and upon occasions, seven when purchase orders exceeded normal capacity. If the mill operators felt that it was justified, they extended the hours of operations, without overtime pay, or put in an additional shift. The latter was done only if a need to increase production was for an extended period. Of course, several of the larger mills operated two shifts, usually on a 20 to 22 hour schedule. A very few operated 24 hours per day with three shifts.

The impression was given, and several informants verified its accuracy, that mill work was more dangerous than woods work. This was especially true where factories were operated. In fact, the possibility of losing fingers to the factory knives and saws was so great that in some places Negroes made up the bulk of the workers in these milling operations (Gosselin, July 23, 1957).

Work was hard and dangerous. Sawmill towns had a large number of amputees and men with badly broken bodies. A doctor was usually available either in the mill towns or within a very few miles. Very few companies provided pay for men while they were recovering from job-associated injuries (S. J. Boudreaux, July 3, 1957). When an agreement could be reached with a local doctor, most companies preferred to utilize his services. If no doctor was available, as was the case with new towns and most of the small ones, a "company" doctor usually was brought in. These
company doctors usually treated mill- and woods-accident victims at company expense. In many cases, a form of health insurance was provided by companies for a small monthly fee, usually one dollar (Anderson, July 27, 1958; Blakesley, June 17, 1957; S. J. Boudreaux, July 3, 1957; and Foret, July 27, 1958). In the few cases in which the workers' families were covered by accident and medical insurance, the cost ranged up to five dollars per family per month. Extremes were present, as in the cases of Goodland Cypress Company, Chacahoula, which paid no doctor bills (Guillot, July 14, 1957), and Lyon Cypress Lumber Company, Garyville, which provided free medical care for the family except for obstetrics and venereal disease (Stebbins, July 9, 1958).

Amusement Facilities and Churches

Most companies that located in places other than well-established towns provided facilities for amusement. Frequently, bars and pool rooms were located in bungalow-type structures, with one side for whites and the other for Negroes. The bars were located in the front rooms on either side, with the pool rooms immediately behind. These facilities usually were run on a concession basis, with at least one (Owl Bayou Cypress Company, Strader) having been operated by a Negro (Weinberger, June 3, 1956).

In general, cypress workmen do not seem to have been so prone to carousing and rowdiness as those of other
lumbering areas. The reason given by informants for relatively little of this was that the workers were mostly local family men. In most cases, roughness was attributed to bachelors, who usually lived in company-owned hotels, which were normally near bars. Reported exceptions to roughness were Bowie, McElroy, and Strader. In the latter, fighting was prevalent among the Negroes, several of whom were unceremoniously buried back of the building housing the bar (Weinberger, June 3, 1956). A few stories were heard about McElroy, but nothing other than general statements of the place being tough and there being lots of fighting (Kramer, May 15, 1958; Powells, July 10, 1956; and Savario, July 10, 1958). These gentlemen reported that E. J. McLaure was brought in by the company to maintain peace. This writer was warned against attempting to interview Mr. McLaure, but did so anyway, and with success. By his own admission, Mr. McLaure was a soldier of fortune in Mexico and Central America around the turn of the century. He was, in 1958, ninety years old, and still both a fast and accurate marksman with rifle, pistol, and shotgun.

Practical jokes, kidding, and story-telling were universal forms of entertainment. One mill town, Bowie, was the subject of many tall tales which were told in such a way as to leave one wondering as to what the town really was like. Many people mentioned the roughness briefly, but refused to discuss it further when questioned, and did
not want to be quoted as having mentioned the subject. Others refused to admit that they knew anything regarding the roughness of the town, but did not deny the tales. Those few that did talk, told of Negroes' being thrown into boilers (Figure 97), and of three superintendents (mill, yard, and woods) who wore pistols while at work. The only person encountered who was willing to vouch for Bowie's being so tough was Joe Price, Jr., who did so to this writer (August 2, 1960) and in writing (1960:2-3). Among other things, Mr. Price and the individuals who did not wish to be quoted said that at the New Orleans train station, a passenger did not ask for a ticket to Bowie, but for one to Hell. And so the place was, or was this interviewer being kidded?

Another form of entertainment around most mill towns was baseball. Many informants mentioned that Mel Ott¹ played at Patterson (F. B. Williams Cypress Company, Ltd.). This town and company became a standard by which others were evaluated among cypress workmen. This company spared no expense relative to baseball (Louisiana, A Text Book on the Industrial, Commercial, . . . 1917?:100). Men interested in baseball knew of Patterson, and spoke disdainfully of any company that did not pay all expenses for its team.

¹Ott went on to a successful career in professional baseball with the New York Giants.
Fig. 97. Boilers of Bowie Lumber Co., Ltd., circa 1903-1904

E. James Kock, Sr.
Land and part, or all, of the construction costs for churches and buildings that served as community or recreation centers were provided by a large number of companies. Two churches were normally provided, one Roman Catholic and the other Protestant. In the latter case, the various denominations represented held either combined services, or would have certain hours or Sundays when the building was available to individual groups.

The community or recreation center frequently contained a reading room as well as a pool room. A small stock of books and magazines was usually provided by the companies. Dances were held in such centers, and it is reported in at least one case, that the fiddler knew only one tune, which he played for all dances, making a difference in time by stomping a foot (Dreibholz, August 8, 1958).

In all new towns and small hamlets, with the exception of Chacahoula, Crescent, Head of Island, and Indian Village, cypress companies built rent houses for some of their employees. In the case of Chacahoula, a concession was let to an individual, who built and rented about 60 houses (Figure 81). In the other towns, local labor was used, and many of them owned their homes. Most of the Crescent labor force commuted from Plaquemine. Some employees of Albert Hanson Cypress Lumber Company, Garden City, lived in company-owned rent houses at the millsit, but many walked to work from Centreville and
Franklin, each some three miles distant. A walkway consisting of two-by-twelve inch planks was constructed from Garden City to Franklin (S. J. Boudreaux, July 12, 1957).

Barely were rent houses constructed by cypress companies in the larger towns, such as Baton Rouge, Franklin, Houma, Jeanerette, Lake Charles, New Orleans, Napoleonville, and Thibodaux.

There is some uncertainty regarding company-owned housing in several mill towns. Information often was contradictory, especially in places which were the sites for several companies. Most of the towns domiciling more than one large cypress company rimmed the Atchafalaya Basin. This rimming began on the west at New Iberia and extended southeasterly to the Berwick-Morgan City-Rhoda-Ramos area on the Atchafalaya River and Bayous Teche, Boeuf, and Ramos (Plate IV). On the east, multiple companies were located at Napoleonville on Bayou Lafourche, White Castle and Plaquemine on the Mississippi, and along Bayou Plaquemine, extending from Plaquemine through Crescent to Indian Village. Other places that contained more than one company were Baton Rouge, the Harvey-New Orleans region, Houma, Lake Arthur, and Lake Charles.

No general spread of introduced house types was detected in the industrial cypress lumbering region. Introduced types were not adopted and spread by the local population to any important extent. Common types are shown in Figures 98 through 106. However, in some cases
Fig. 98. Representative house type, constructed around 1905, found throughout the cypress industrial area. Garyville, 1957.

Ervin Mancil

Fig. 99. Company-built houses in Sorrento, 1958. These houses were constructed around 1910.

Ervin Mancil
Fig. 100. Company-built house in Lutcher, 1958. Constructed soon after 1890. This type house was a common type in mill towns.

Ervin Mancil

Fig. 101. Typical company-built house in Garden City, 1958. Constructed between 1915 and 1920.

Ervin Mancil
Fig. 102. Company-built houses for white employees, Plaquemine, 1958. These houses, constructed in the 1890's, are a common type in the industrial cypress region.

Ervin Mancil

Fig. 103. These company-built shotgun houses for Negro employees is commonly found throughout the cypress industrial region. Constructed in the 1890's. Plaquemine, 1958.

Ervin Mancil
Fig. 104. White employee's house at Blanks, 1958. Constructed around 1913, this type is widely distributed within the cypress industrial area.

Ervin Mancil

Fig. 105. Negro employee's house in Blanks, 1958. This house, constructed around 1913, is a representative type in cypress mill towns.

Ervin Mancil
Fig. 106. Representative type company-built Negro houses, Garden City, 1938. Constructed between 1915 and 1920.

Ervin Mencil
company-built houses are quite noticeable within the local landscape (Figures 107a through 115b).

Gardens

It was customary during the days of industrial cypress lumbering for rental housing, including that constructed and owned by lumber companies, to have sufficient space for a vegetable garden with each unit. Cypress workers' pay was better than that of agricultural hands, but still was not enough to provide for much more, if any more, than the basic requirements of a family. Most families raised vegetables to supplement incomes. Then, too, most people, including urbanites, at that time had enough of a rural heritage to want to raise their own vegetables. Commissaries and groceries were not as well equipped to stock fresh vegetables as they are now, and rarely attempted to do so. Any selling of such was left to the occasional fruit and vegetable vendors, some of whom found the poor market situation profitable enough to justify their efforts.

Public Service Facilities

All informants were asked about towns and their

\[\text{2} \text{One dollar per day was the usual pay for farm hands. The wages of cypress laborers varied considerably, with a low of one dollar and fifteen cents daily (Hoover, July 27, 1958) and a high of five dollars (Bourgeois, August 17, 1957) being quoted. It seems that most cypress laborers were paid one dollar and fifty cents to two dollars per day.}\]
Figure 107a. Front View

Figure 107b. Rear View

House for white employees, constructed in 1905, Garyville. This is a nontypical type within cypress mill towns. 1960.

Ervin Wencil
Fig. 108. Company official's house at Lutcher, 1960.
Constructed in the 1890's.

Ervin Mancil

Fig. 109. Company official's house at Ramos, 1958.
Constructed before 1900.

Ervin Mancil
Fig. 110. Company-built house in Garden City, 1958. This house, constructed between 1915 and 1920, is a representative type for office workers, skilled workers, and foremen. Awnings are a later addition.

Ervin Mancil
Fig. 111. Company official's house at Garden City, 1958. Constructed between 1915 and 1920.

Ervin Mancil
Fig. 112. White employees' duplex houses at Garden City in 1958 are not typical cypress mill town structures. These were constructed between 1915 and 1920.

Ervin Mancil
Fig. 113. An official's house, Garden City, 1958. Built between 1915 and 1920.

Ervin Mancil
Fig. 114. Office building, constructed about 1913, Garden City. The second floor served as bachelors' quarters. The building housed the post office and a land company's office in 1958.

Ervin Mancil
Fig. 115a. Front view

Fig. 115b. Rear view


Ervin Mancil
facilities. The only new towns and small settlements that were praised by former inhabitants were Donner, Garden City, Garyville, and Patterson. The companies in well-established towns did not get so closely involved with their employees' private lives, thus were not as subject to criticism.

Services within towns varied considerably in quantity and quality. No mention was made of commissaries, other than A. Wilbert's Sons in Plaquemine, being operated in towns that were established before cypress lumbering became big business. In new towns and villages most companies operated commissaries. In a few cases the commissaries were leased as concessions, as were most bakeries, butcher shops, and all barber shops. The fewest services provided was at Gibson, where the company built two houses for officials, a few shacks for Negro employees, and a store (Guillot, July 14, 1957).

In all but the larger and older towns, cypress companies supplied the first electricity, and in a few cases, put in the first sewer and water systems. In many towns, because of low electric generating capacity,

3 Small settlements frequently came to closely resemble new towns. These places were normally small trading centers, with a church or two, and a few homes. Existent services had been insufficient when the mill people came in. Newcomers frequently outnumbered the native residents. The lumber companies commonly installed about the same services and facilities as in new towns in order to meet the requirements of their employees. Of course, such services and facilities, especially the commissaries, were profitable within themselves.
residential use of electricity was not permitted during the hours that the mill operated. In fact, in a few towns, residential use of electricity was restricted to the hours between 6 and 10 p.m. Gibson is the only millsite known where no electricity was generated. Informants referred to the company as "cheap" and "a shoestring operation." On dark days, and at night, kerosene lanterns were hung throughout the mill.

Schools were constructed in the new towns and many of the hamlets. Several, but not many, of the companies paid all or part of the teachers' salaries, donated land, and construction materials for schools.

The Woodsmen

The woodsmen's day normally began in time for them to be on the job by daybreak, or, as the loggers expressed it, when it was light enough to see to cut a tree. The men frequently were awakened by the cry "Daylight in the swamps." So, depending upon how far they had to travel to work and the season of the year, they awakened anywhere from two to five o'clock in the morning. The men usually had finished their day's work no later than two o'clock in the afternoon.

Two of the more authoritative sources (Lillard, 1948:281; and Bryant, 1923:33) stated that Negroes made up the bulk of the swampers, and Lillard stated that "Negroes

4It seems to be customary to use the word "swamper"
were never allowed to run the machinery in Southern lumbering" and goes on to say that Negroes' "... lives were now as cheap as the lives of Irish immigrants ..." in slavery days (1948:28). Figure 36, of Bowie Lumber Company, Ltd., along with reports about Iberia Cypress Lumber Company, New Iberia (Hedt, July 6, 1957) and Vacherie Cypress Company, Vacherie (Barker, July 26, 1958) indicate that blacks did, in at least a few cases, operate machinery. It is impossible to determine what percentage of the swampers was Negro, but it was greater than half for the industry as a whole.

**Old-time Swamping**

Perhaps any discussion of the swampers' daily lives should include the pre-industrial period. It was not until the industrial period, about 1890, that cypress logging became a year-round affair. The early swampers cut trails, girdled, and felled trees on a seasonal basis. Since almost all of them were of local origin, it was customary for them to engage in agriculture or trapping part of the year.  

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5 It was reported by Bourgeois (August 17, 1957) that some industrial mills in Jeanerette closed during November and December so laborers could help harvest sugar-cane. During this time, repairs were made on mill and logging equipment and machinery.
The swampers worked in pairs, and if water was deep, used pirogues, skiffs, or flats to get to the trees. A report that the early swampers went in "... with a little food—and a little more whiskey. .. ." (Horn, 1943: 120) was vigorously denied by all informants. Assuming that the large number of informants questioned on the matter were telling the truth, the only source found in literature to verify Horn's statement is in Norgress' work (1947:1000). Informants said they had never heard of anyone's carrying alcohol onto logging operations, and it was dangerous enough in the swamps without alcohol.

Only one informant (Kramer, May 15, 1958) reported working in the time-honored pre-industrial manner on a seasonal basis as an independent swamper, and trapping and farming at other seasons. Kramer, his brothers, and friends worked together in a group of seven. One stayed at the camp to hunt, fish, and cook while others girdled and felled trees. A rotation system was used whereby one day was spent at the camp as cook, fisherman, and hunter, and six days in the woods. For shelter the swampers built a cabin, usually of board-and-batten construction (Figure 116), but occasionally of palmetto. They took in enough coffee, sugar, flour, rice, beans, and condiments, but no whiskey, to last several weeks. Two-or-three-days' supply of meat was brought in, but afterwards the cook was depended upon to supply the group with fish, squirrels, ducks, alligators, and other wildlife as meat. At the
Fig. 116. Swampers' Camp as photographed by George A. Coulon in 1888.

Comeaux, 1969:33
time of the spring flood, the logs were floated out and sold to a sawmill. No other instance was encountered of such casual, pre-industrial logging methods as practiced by Kramer and his friends.

Swampers and Boats

Regarding the swampers' use of boats, Frost (1946: 8) reported:

The last axe blows would be delivered, one foot in a floating pirogue, the other foot against . . . the cypress trunk. Just as the tree started to sway, . . . with incredible agility and balance he would shove off with one foot, and glide out of danger . . . .

Shay (1956: 5) used almost the same statements as Frost in writing of cypress loggers. This writer found the foregoing difficult to believe, but some informants confirmed it. One, Alcide Gaudet, Plaquemine, said fellers often carried two axes, one of which was sunken into the tree and used as a foot prop while the other foot rested in the boat (July 11, 1958). Another informant reported fellers often stood in a boat, sometimes two in the same flat or skiff, but he knew of no instance in which they placed one foot in the boat and the other on a springboard (Figure 117) or bench⁶ (Figure 118) (Richardson, April 29, 1958). Hoover stated that fellers chopped from pirogues, or would

⁶The springboard and bench were used in order to make the cut above the butt swell. One result was tall stumps, which was wasteful though often unavoidable (Figure 119).
Fig. 117. Fellers using eight-foot-long springboards, which also were known as staging or swag boards. Date: 1926.

U.S. Forest Service. Courtesy Louisiana Forestry Commission
Fig. 118. Fellers using a bench to get above the butt swell on a gum tree, 1926.

Louisiana Forestry Commission
Fig. 119. Tall stumps left as a result of cutting above the butt swell. Date: 1926.

United States Forest Service
Courtesy Louisiana Forestry Commission
jump from bench or springboard into them, and paddle out of the way (July 27, 1958). Perhaps they did.

Swampers' Health

Though not all swamps had deep water, in every one there were submerged spots as well as lakes, ponds, and streams containing cypress. Wading through water, then, was always a possibility. Several informants spoke of breaking ice, but cold and other natural conditions did not bring an abnormal amount of illness. In fact, the swampers felt they were healthier than average individuals. Though none agreed to be quoted, a number of informants reported that after a day in the water, whether winter or summer, their biggest problem was finding their water-shriveled penises.

Where Swampers Lived

Most swampers were local residents, and thus lived at home, although there was a sizeable number of exceptions to this. Many rented houses from the companies. In railroad logging, if the woodsmen were bachelors, or lived too far away to commute, they lived in company-built hotels. In some cases the company owned and operated the hotels; in most, however, the hotel was let as a concession. In railroad logging, the men rode trains (Figure 49) or handcars (Figure 50) to and from work locations.

Rarely did the men live at home during the week while working on pullboat operations because they normally
worked too far back into the woods to commute daily by boat. Customarily, then, the entire crew lived on quarterboats. The superintendent, pullboat engineer, and foremen lived either on the first floor of the quarterboat, which also was the location of the kitchen and dining room, or they were quartered on a smaller quarterboat. The crew occupied the upper storey of the quarterboat that housed the kitchen and dining room.

Food for the men was plentiful, and of the rib-sticking variety. The staples were beans, rice, pork, and biscuits. Occasionally, alligators, deer, ducks, and geese were killed, or big catfish taken on trot lines, to add variety to the meals. There rarely were complaints about the food. On the last pullboat operation in Louisiana, that of Fernwood Industries, Inc., the crew was served what it wanted, which was navy beans, pork chops, and biscuits for breakfast, lunch, and dinner.

Exceptions to this did occur. For instance, among the photographs in the Department of Geography and Anthropology, Louisiana State University, collection are two showing skidder camps. These likely were set up for pullboat operations because floating logs are shown (Figure 120). No instance was found wherein railroad-skidded logs were rafted to mills. Another exception to living on quarterboats was given by Cotton (August 12, 1957), who reported that Cotton Brothers Cypress Company, Morgan City, built pew (board and batten) camps on some pullboat operations. Rough lumber was taken in and used to construct roofs, walls, floors, tables, chairs, and bunks. Spanish moss was piled on the bunks to serve as mattresses.
Fig. 120. Skidder camp around 1903-1904. Probably this was a pullboat operation because no instance was found of railroad-skidded logs' being rafted.
Traversing Swamps

Anyone who has walked through a swamp will readily agree that a great deal of physical stamina is required. This, it is suspected, is why only two photographs, one of a sheave block (Figure 13), and one of a tall tree (Figure 26), were located that show the far end of swamp logging operations.\(^8\)

Movement about logging operations in swamps was far more difficult than that confronting most who traverse such areas. Float logging provided the easiest conditions. In this type of operation, boats normally were used to get to and from the work site. Paddling a boat was far easier than wading, which normally involved getting wet when stepping into holes and tripping over debris. But, even wading through swamp water on float logging operations was not so bad as traversing railroad and pullboat skidded areas. These latter operations disturbed the surface far more than float logging. The skidding of logs and blasting of obstructions out of the rights-of-way loosened soil and organic particles. These particles were carried by water and deposited over the entire area if it was a deep swamp, or they were transported about after rains brought local flooding conditions. These sediments also were deposited on logs and debris on the swamp floor. As a result, the possibility of slipping and falling was increased

\(^8\)For a report on a trip into a swamp on a pullboat operation, see Mancil, 1960:12-16.
considerably over that of float logging because the fine sediments were quite slippery. Men usually carried a stick with a fork on one end when going into or out of the woods. The stick functioned as a walking cane, and it was hoped that the forked end would catch on a root, limb, or penetrate the ooze to solid earth, when the walker slipped or stumbled. If the stick caught on something solid, then the user was more likely to regain balance sufficiently to avoid falling into the mud, or onto limbs, logs, or stumps.

The cypress woodsmen, in general, disliked rubber hip boots and waders. These articles hindered movement, and as a result, the crews rarely used them. Some logging superintendents, foremen, and pondmen wore hip boots or rubber waders.

As indicated, most pullboat crews lived on quarterboats while working. They went out by boat on Monday morning and returned home for the weekend. Upon rare occasions, the crews' womenfolk and other family members were invited to the pullboat set. The usual date was the Fourth of July. The quarterboats were cleaned with extra care, the men spruced up, and the cooks prepared a special meal. The day was spent in visiting between the men and their families.

The cypress woodsmen liked their work. Some reasons for this were stated earlier. Another reason given by woodsmen was that they liked the outdoors. When Fernwood Industries, Inc., began putting together a
pullboat and seeking a crew, it was reported (Burris, February 1, 1959; Kent, March 7, 1959; and Ramsey, February 7, 1959) that old-time pullboatmen, and inexperienced men who had heard of the old days, eagerly sought employment.
CHAPTER VIII

SUMMARY

This study was an attempt to record as much as possible of the development of industrial cypress lumbering in Louisiana and the resultant physical and cultural imprints upon the area. If value accrues to this study, it is because no previous attempts have been made to bring together as many aspects as possible of cypress lumbering in this state. The literature is available to any researcher, but many of the informants—likely all of those with first-hand knowledge of the first years of industrial lumbering—cited in this work are now deceased, and with them went much information. This writer feels fortunate that they left some data with him. This work, then, was an effort to record from literature and a few informants the botanical and habitat characteristics of cypress, and from a meager literature and many informants the historical geography of cypress lumbering.

Cypress in sufficient quantities for large-scale industrial lumbering and milling in Louisiana occurred within the wetter portions of the bottomlands of the southern part of the state. Delineation of these areas was primarily achieved through the use of aerial photographs.
and topographic quadrangles which revealed scars left by industrial logging techniques. Also, additional areas, where sedimentation or subsidence have obliterated the logging patterns, were obtained from informants. Another indicator of the limits of large-scale cypress operations is the location of milling sites where cypress was the only wood milled, or comprised a minimum of 50 per cent of the cut. These various sources revealed that large-scale cypress logging and milling were confined to southern Louisiana. Practically all industrial cypress lumbering occurred between a southern boundary of 29°30' north latitude, where the coastal marsh begins, and 30°30' north latitude to the north, which is just above U.S. Highway 190. On the west, Bayou Teche forms the boundary for the bulk of operations. Eastward, the Mississippi River as far south as Ascension Parish is roughly coincident with the boundary. In Ascension Parish the cypress area extends eastward from the Mississippi River to encompass lands along the northern shores of Lakes Maurepas and Pontchartrain. The absolute easternmost limit is reached at Madisonville, along the Tchefuncte River. There were other, smaller, regions to the west, such as along the Calcasieu and Sabine rivers, that lay outside the major one. The areas delineated were those where the abundance of cypress justified logging by pullboats and railroad skidders.

The bulk of the industrial cypress regions was poorly drained swamplands, normally being flooded part or
all of the year. There were few permanent human inhabitants within the cypress forests proper; only an occasional trapper, family group, or hermit lived within them. Perhaps it should be noted at this point that drainage improvements have occurred over large sections since the era of industrial cypress lumbering began. At the beginning of the era, population on the higher lands within and encompassing the swamps varied considerably in density, but all settlements were relatively small, with the notable exceptions of Baton Rouge, Lake Charles, and New Orleans. Into this region of generally low population and poorly drained conditions came industrial cypress lumbering with concomitant effects.

The tree upon which this activity focuses is itself quite distinctive. The name "cypress" was given the tree because its wood closely resembled that of the Old World cedar, genus *Cupressus*. The scientific classification of cypress was an area of disagreement and uncertainty, but there now seems to be agreement on one species, *Taxodium distichum*, with a variety, known as *Taxodium distichum, nutans*, existing only in the United States. There is another, non-commercial, species, *Taxodium mucronatum*, in Mexico. Though they are frequently found growing together in mixed stands, *Taxodium distichum* is considered to be an inhabitant of wetter areas, and is frequently referred to as "bald" or "red" cypress, while the variety *nutans*,
known as "pond," "upland," or "white" cypress, is found on portions of the bottomlands.

Cypress, a deciduous conifer, is also quite distinctive botanically and in appearance. Buttresses and knees, though not peculiar to cypress, are commonly characteristic of the tree, but there are no widely accepted ideas as to why these distinctive features are developed. However, it should be noted here that, contrary to popular belief, the knee is not an oxygenating organ. The tree is confined to the southeastern United States, is geologically old, and considered to be the longest-lived and largest tree east of the Mississippi River. Annual-growth ring counts have been found to be inaccurate; thus, the maximum age is unknown, but is generally considered to be well over 1,000 years. Most of the literature dealing with size, age, and longevity discusses bald cypress. Very little information is available on any aspect of pond cypress. Bald cypress is a large tree, normally attaining a height of 100 to 120 feet, and a diameter of 3 to 5 feet at maturity. The maximum size is a height of 150 feet and a diameter of 17 feet. Pond cypress is smaller, with mature trees reaching a height of 70 to 80 feet. No figures on the diameter of the latter tree were found.

Cypress has few enemies in the forms of insects and diseases. The most notable insects are borers, which attack felled trees left in the woods too long. A notable disease is the fungus Stereum taxodii, which results in "peckiness"
or "pegginess." When an infected tree is cut, the fungus dies and no further damage occurs, but due to the fungus-caused holes, the wood is structurally weakened. Pecky cypress has acquired a considerable esthetic, and thus, economic value. Parasitic values are sometimes erroneously given to Spanish moss. However, this plant may cause damage when thick growths over-shade a cypress, or when heavy from rains, cause weakened limbs to break.

The wood's characteristic of being easy to shape with hand tools (because of its relative softness and straightness of grain), along with its resistance to acids and, where pertinent, attack by rot and termites, made it a highly desirable commercial product. Cypress, then, along with other woods such as oak, cedar, and pine, was used along the Gulf coast immediately after the Spanish and French arrived. Plans were being made by the French as early as 1708 to establish timber trade from Louisiana, and two sawmills are known to have been in operation in Louisiana by 1716. Exportation of cypress began soon after French settlement in Louisiana. The earliest date found where cypress was identified as a product of sawmills and an exported item is 1722-1723.

Seemingly insurmountable problems faced the early cypress loggers and sawmill operators. Logging for cypress was difficult and there was a lack of an efficient and reliable source of power for operating saws. In the best of situations, cypress was located in boggy areas. There
was a shortage of animals for power and, even when they were available, the muddy conditions made dragging large logs difficult and frequently impossible. The greatest contribution made by early lumbermen was the technique of girdling (deadening) cypress. This resulted in sufficient loss of weight so that some 95 per cent of the deadened trees would float as opposed to around 15 per cent for green trees.

The problems of logging and milling, along with other than local popular disinterest in Southern woods, kept cypress production low until the latter part of the nineteenth century. Milling by hand-hewing, hand-powered pit sawing, and horse- and water-powered sash sawing was both laborious and low in productivity of finished products. Very little progress was made in cypress lumbering until late last century, when near depletion of northern forest resources, the development around 1890 of successful mechanical means of removing cypress logs from swamps, and the previously developed steam-powered sawmill made possible the commercial exploitation of Louisiana's swamp-lands.

Before mechanization, lumbermen left few permanent scars on the landscape, and those scars were largely obliterated in the ensuing industrial decades. Early lumbermen removed only those trees that were easily accessible by water, that is, along lake or stream banks or in nearby flooded areas. Upon occasions, crevasses were
deliberately caused in order to flood swamps so felled trees could be floated out. Pre-industrial methods of logging, largely by floating, and sometimes by animal power resulted in the removal of only a small amount of cypress. Logging was seasonal and the methods used produced few logs; thus, milling normally was also on a seasonal basis. Most of the milled wood was consumed locally, but enough was shipped elsewhere for the excellent reputation of cypress to become widespread.

After the Civil War there was increasing pressure upon northern forest resources as population increased and settlement advanced within the Mississippi drainage basin. As a result, northern lumbermen investigated Southern and Western timber supplies, and some of them shifted their activities to those areas of virtually untouched timber resources. The steam skidder was invented in 1883, and Southern pinelands were easily logged by this machine. The first application of steam skidding to cypress swamps was around 1889, when the equipment was mounted on a barge. This type skidder became known as a "pullboat," and, with the improvements that quickly followed, could economically remove logs from swamps in industrial quantities. This successful means of logging swamps on a year-round basis was quickly followed, in the early 1890's, by the equally successful railroad skidder operations. The exploitation of Southern pine and cypress forests using steam-powered logging equipment made the region an important year-round
producer of wood products for the nation before the end of the nineteenth century. However, by the middle 1920's almost all of the South's—and Louisiana's—virgin forests had been removed. The results were physically and culturally significant.

The successful exploitation of the South's vast forests was, in addition to the aforementioned factors, due to the development of railroads. Prior to the construction of a railroad network in Louisiana, logging operations were almost entirely restricted to the watersheds of a few streams, such as the Atchafalaya, Calcasieu, Pearl, Plaquemine, Red, and Teche, from which log movement by water was possible. The basic railroad net was completed in the decade 1880-1890; the first train to make the run between New Orleans and Chicago was in 1873, and in 1883 the rail links between California and New Orleans were completed. Railroad mileage increased quite rapidly after 1880, and declined considerably in the post industrial lumbering era. Unfortunately, it is not possible to accurately analyze the relationship between railroad construction and the lumbering industry, largely because of the inadequacy of census data and the fact that the period of industrial lumbering in Louisiana coincided with the latter part of the era of great railroad expansion in the South, the Mississippi Valley, and the West, but also due to the fact that virtually no literature exists as a basis for such an analysis.
Industrial lumbering of cypress swamps could have gone forward regardless of railroads, because of the development of the pullboat; pine exploitation, however, would have been much delayed without railroads. Nevertheless, industrial exploitation of cypress would have been neither as intensive nor as extensive without railroads. It is impossible to state how much railroad mileage was constructed as a response to logging (whether speaking of cypress, pine, or both), but certainly the industrial lumbering era greatly affected railroad construction and, in turn, was influenced by railroads.

To repeat, several factors were pointing toward an industrial lumbering development in Louisiana in the latter half of the nineteenth century. Again, there were sawmills here to be sure, but they were small operations, and more often than not, cypress mills operated on a seasonal basis. Large, modern mills, such as those around the Great Lakes, were nonexistent in Louisiana.

Industrial exploitation of cypress began rather suddenly. Its debut was in Louisiana, though this state, along with other Southern coastal states (especially the Carolinas and Florida), had a long history of small mills and trade in cypress and other woods. The large scale phase of the industry began in Louisiana, in part because of almost annual Mississippi River overflows, the extensive, almost pure, stands of cypress, and direct rail and water connections with the developing upper Mississippi
Valley. Flooding of the swamps made logging by pullboat and float methods technically successful, while shipment up the valley toward the Great Lakes made it economically successful. Swamp industrial logging was difficult and expensive, but, because of the dense stands of high-quality cypress, a good market, and the efficiency of pullboat and railroad logging, many operators profited handsomely.

The nature of cypress, the expense of swamp logging, and the remoteness of the markets meant that the most successful operations were large in scale, with large timber holdings and integrated logging and milling facilities. These factors, along with potential profits, encouraged the development of big mills, including saw and planer mills, lathe, shingle, sash, and other dimension-stock factories. Large timber holdings and mills were also encouraged by the fact that most cypress was air dried, which required one year per inch of thickness. This meant that extraordinarily large inventories had to be carried in order to fill purchase orders.

During the industrial cypress lumbering period, 1890 to 1925, some old-fashioned floating of logs occurred, but this method was too unreliable for large-scale year-round activity because too few logs could be moved and the necessary floods did not always materialize. Therefore, almost all of the timber was logged by pullboat and railroad skidders. Pullboating involved the use of natural waterways as well as extensive digging of canals. Logs
were pulled to the machine by wire cable for distances as great as a mile. The changes wrought by pullboating, other than the efficient removal of all merchantable timber, varied with local conditions and the placement of the spoil from dredging. Normally, if the spoil was placed on both sides of the canal, blocked drainage occurred throughout the entire swamp basin, thus resulting in deepened water. However, if one side of the canal did not receive spoil, the section of the swamp bordering it was drained while the water was deepened on the side on which the spoil was piled. In either case, the swamp water changes resulted in modifications in plant and animal life. Also, the runs along which the logs were skidded were dug to depths of six to eight feet and remain too soft for the establishment of trees. The pullboat runs are still clearly visible from the air and on the ground, and seriously impede travel through the swamps.

Logging by overhead railroad skidder was just as efficient as the pullboat, and more destructive of uncut timber. Because the logs were pulled while partially suspended from an overhead cable, standing trees were killed or heavily damaged by the rapidly moving, swinging logs. The logging spurs were constructed close enough to each other (600 to 800 feet apart) so that all parts of the area could be reached. Thus, the entire forest was either removed or badly damaged, leaving few, if any, cypress trees for re-seeding the area. Also, the railroad beds blocked
normal drainage patterns, and deepened swamps with consequent plant and animal life changes were the unfortunate results. This technique of logging resulted in far greater changes within swamps than did the float and pullboat methods. Float logging was the least damaging.

The positive effects of logging-induced swamp changes are minimal. In a few places old railroad beds serve as modern roadbeds or as access routes into swamps, and many sections of pullboat canals serve as portions of modern drainage systems and small boat and barge navigation channels. Very frequently, the railroad beds and canal spoil banks have become the sites for the regeneration of trees within the deepened swamps.

In addition to physical modifications, there were cultural changes, though the former were of greater importance. Louisiana received relatively few newcomers in association with cypress lumbering. The total effect of these people was not as great as might be expected because most of them seem to have moved on when the industry declined, and those that did remain became acculturated into local patterns. No enduring culture traits or patterns were initiated by those outsiders. Although examples of introduced housetypes can be seen at a few places, such as Garden City and Garyville, introduced architectural forms were not generally adopted by local people. An important effect of the industry on population was that of inducing local shifts, which tended to be temporary in nature.
It should be noted that, though temporary, these shifts were important at that time.

The most notable cultural effects of the industrial cypress activities in Louisiana were the growth of established settlements and the development of new ones. In all but the largest prior towns (Baton Rouge, Lake Charles, and New Orleans), growth was significant as the industry developed, and decline equally so as cypress lumbering decreased. Almost all new towns were abandoned, and today their sites are difficult to locate. When located, evidence of their former existence is minimal and likely to be in the deteriorated form of a mill pond, canal, levee, railroad bed complex, concrete foundations for mill machinery, or a building or two. Most prior towns experienced rapid population and economic decline, and returned to their former sizes and functions as cypress lumbering ceased. The exceptions to this were few and based upon newly developing economic activities, such as the petrochemical and saltwater fisheries industries. Thus, the cypress industry's effect upon settlements was almost totally transitory on prior towns, and, as mentioned, most of the new towns were abandoned.

Cypress workers expressed a high degree of nostalgia for by-gone days, even though the work was both hard and dangerous, and wages were low. The woodsmen seem to have liked their work slightly more than the millmen. Hours worked were long, normally 11 to 12 hours per day, six days
per week. However, these conditions were generally normal for Southern industrial workers at that time; certainly wages paid cypress workers were higher than those paid local agricultural laborers. Perhaps the nostalgia is normal in that historically most people seem to have believed the days of their youth were the best, especially when important events or activities occurred. Cypress lumbering was of such local importance.

Places of abode were the same for millmen and woods- men: some lived in rural areas, in which case they frequently owned their homes; some lived in towns, and most of these were not home owners. Those that resided in new towns rented, with few exceptions, company-owned houses. The same is almost as true of those who lived in the prior small settlements which grew considerably after the arrival of cypress lumbering. In larger prior towns most cypress workers owned their homes or rented from townspeople.

In new and prior small towns, the general rule was for the company to own, or lease as concessions, such facilities as commissaries, bakeries, hotels, boarding houses, and barber shops. These were sources of income for the lumber companies, though the income from these investments was slight when compared to that of lumbering activities. Normally, medical facilities in new and prior small towns were company-sponsored with the doctor having been brought in by the company. Usually local doctors and medical facilities were utilized in well-established prior towns.
In new and small prior towns, the company normally provided the land and, frequently, part or all of the cost of church, school, and community center construction. In well-established towns, the companies provided few, and usually none, of the foregoing facilities. In these towns, local economic enterprises prospered as the towns grew with the cypress activity. In both new and prior towns, cypress companies very often initiated the installation of such public utilities as water, electrical and sewage systems. However, despite the above statements, very few of the lumber companies paid a fair share of the cost of development and maintenance of public works. This was the subject of bitter complaint by many individuals interviewed during this study.

Industrial cypress lumbering brought significant modifications to southern Louisiana, with the physical changes assuming greater importance than the cultural ones. The most substantial results were the removal of cypress, a virtually non-renewable organic resource, and the changing of the swamps. At this point in time, it is not possible to assign accurate quantitative values to the physical changes wrought in the swamps by industrial logging operations. This is true in part because no records were kept of swamp water conditions, or of the kind and quantity of plant and animal life, in part because of naturally occurring physical changes, and in part because of culturally induced modifications, such as drainage and navigation systems, and leveeing.
Cultural changes also are difficult to assess, primarily because they were few and relatively minimal, but also in part due to the scarcity of recorded data and the late date of field research by this investigator.

It is highly regrettable that a more complete record than this study is not available, but value devolves upon the present work in that it is the only existing study attempting to cover the entire story. It is a matter of concern that much local folklore, history, and ways of doing things have passed and are passing beyond recovery, as has so much of the record of cypress lumbering in Louisiana. These losses are lamentable. Should this study contribute to the cultural and scientific knowledge of cypress and its exploitation, and should it stimulate anyone to investigate a topic before it is too late, the effort expended will have been worthwhile.
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APPENDIX A
INFORMATION CHECK SHEET
APPENDIX A

CHECK SHEET:  + = yes; 0 = no

Town_______________________Estab.____by Co.____Cut out____
Parish_______________________Photo.____Quad.__________________

FORMS PRESENT:
machine shop____ hardwood mill____
planer mill____ shingle mill____
dimension stock____ kilns____
lbr. yd.____ mill pond____ depot____
water tank____ generator____

REMARKS

SHIPPING:

RR____ Bding: W N____
Boat____ Hotel: W N____
Co. boat____ Commissary____
Canal____ Ice house____
Stream____ Doctor____
Barber shop____ Drug store____
Church____ Post office____
School____ Cemetery____
Theatre____
Recreation Hall____

LOGGING METHODS:
Girdling____
Floating____
Skidding____
animal____
railroad____
pullboat____
own pullboat____

Camps:
stationary____
quarterboat____
Season of logging____
Transportation to mill____

LABOR:
Mill:  W N Foreign____
Woods:  W N Foreign____
from where____
How obtained____
professional____
skilled____
common labor____
part-time____
Where resided:
millmen____
woodsmen____
Ervin Mancil was born February 8, 1926, in Pitkin (Vernon Parish), Louisiana, and was graduated from Pitkin High School in 1943. He served four years with the United States Navy, Submarine Service, and was honorably discharged in 1947. In 1952 he was granted a Bachelor of Arts degree in social studies, education, by Southeastern Louisiana College. A Master of Arts degree in geography was granted by Louisiana State University in 1954. In that year he was admitted into the doctoral program at Louisiana State University. During the academic year 1956-1957 he was Assistant Professor of Geography and Head of the Department of Geography at Morris Harvey College, Charleston, West Virginia. He has taught geography at Southeastern Louisiana University since 1958. He is a candidate for the degree of Doctor of Philosophy in Geography and Anthropology at Louisiana State University in August, 1972. He was married to Ernestine Elizabeth Ingram Crowe on June 25, 1965. A son, Mark Steven Mancil, was born to a previous marriage on November 9, 1961.
EXAMINATION AND THESIS REPORT

Candidate: Ervin Mancil

Major Field: Geography

Title of Thesis: An Historical Geography of Industrial Cypress Lumbering in Louisiana

Approved:

Roland S. Canada
Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

William G. Haag

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Date of Examination:

May 8, 1972