

David J. Cooper. 1986-1987 ARCHAEOLOGICAL SURVEY OF THE  
SCHOONER FLEETWING SITE, 47DR168, GARRETT BAY, WISCONSIN.  
(Under the direction of William N. Still) Department of  
History, October 1987.

The purpose of this study is to document archaeologically and historically the extant wreckage of a nineteenth century Great Lakes schooner found in Garrett Bay, Wisconsin. Research methodology includes an underwater archaeological survey of the site as well as a historical study of the vessel itself. Using a grant from the East Carolina University Program in Maritime History and Underwater Research the author, accompanied by the Program staff archaeologist and two volunteers, surveyed the site of a well-known shipwreck reputed to be that of the schooner FLEETWING, lost in 1888.

With a boat, survey equipment, and diving gear loaned by the Program, the project staff surveyed the site in August, 1986 to form a basic site plan of the orientation and location of six major sections of wreckage. Then, with mapping equipment, the wreckage sections were drawn in detail and analyzed for construction methodology and identified as to probable original function in the former vessel. 1987 work centered on photographic documentation and wood sampling.

The historical background produces an overall view of the evolution of Great Lakes maritime history, and especially the development of the Great Lakes schooner. This design was produced by a complex interplay of economics, geography, commerce, regional weather, and the traditions of marine architecture. A specific historical investigation of the schooner FLEETWING reveals the vessel's own place in these regional patterns, and provides concrete examples of their effect in vessel design and useage. The historical assertions regarding ship construction are backed by archaeological data from the FLEETWING itself, as well as three other Lake vessels.

Additionally, the study of the FLEETWING raises several questions regarding the circumstances of her loss, and includes a discussion of specific navigational and financial problems which may have contributed to her fate.

Apart from documenting and interpreting one of Wisconsin's better-known submerged cultural resources, the FLEETWING study attempts to place this genre of vessel in its historical perspective with a discussion of its construction, use, and the persons that surrounded it. It also seeks to enlighten the reader to the value of Great Lakes submerged cultural resources and their present lack of protection or preservational efforts.

1986-1987 ARCHAEOLOGICAL SURVEY  
OF THE SCHOONER FLEETWING SITE,  
47DR168, GARRETT BAY, WISCONSIN

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Presented to  
the Faculty of the Department of History  
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David J. Cooper  
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Manitowoc Public Library, Brown County Library, Gibraltar High School Library, Manitowoc Maritime Museum, and the Milwaukee Public Library Wisconsin Marine Historical Collection.

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. . . [I]n their interflowing aggregate, those grand fresh-water seas of ours, Erie, and Ontario, and Huron, and Superior, and Michigan, possess an ocean-like expansiveness, with many of the ocean's noblest traits: with many of its rimmed varieties of races and climes. They contain round archipelagoes of romantic isles, even as the Polynesian waters do; in large part, are shored by two contrasting nations, as the Atlantic is; they furnish long maritime approaches to our numerous territorial colonies from the East, dotted all round their banks; here and there are frowned upon by batteries, and by the goat-like craggy guns of lofty Mackinaw; they have heard the fleet thunderings of naval victories; at intervals, they yield their beaches to wild barbarians, whose red painted faces flash out from their peltry wigwams; for leagues and leagues are flanked by ancient and unentered forests, where the gaunt pines stand like serried lines of kings in Gothic geneologies; those same woods harboring wild Afric beasts of prey, and silken creatures whose exported furs give robes to Tartar Emperors; they mirror the paved capitals of Buffalo and Cleveland, as well as Winnebago villages; they float alike the full-rigged merchant ship, the armed cruiser of the State, the steamer, and the birch canoe; they are swept by Borean and dismasting blasts as direful as any that lash the salted wave; they know what shipwrecks are, for out of sight of land, however inland, they have drowned many a midnight ship with all its shrieking crew.

Herman Melville, Moby Dick, 1851

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## INTRODUCTION

While the volume of literature on Great Lakes shipping and shipwrecks is rather large, most of it lacks detailed discussion of early methods of lake vessel construction, especially for the ubiquitous lake schooner. Much of this information has not been preserved historically. Few construction plans for lake schooners built prior to 1880 survive.<sup>1</sup> Many of these vessels were constructed on traditional lines without the benefit of marine architectural plans, leaving little documentary evidence of methodology. Therefore, much of this construction data is accessible only through archaeological investigation of vessel remains.

Additionally, archaeology can provide new data on shipboard life, vessel use, repair, cargoes, and commerce for this crucial formative period in Great Lakes history. Archaeological survey also has important application in cultural resource management.

Unfortunately, very little archaeological data has been collected on Great Lakes shipwrecks. The abundant and generally well-preserved submerged cultural resources of the Great Lakes have attracted little of the scientific attention that they deserve. Until recently,

most state governments have placed little priority on underwater site management and protection. The underwater protection and surveying that has been conducted has primarily focused on the state of Michigan waters or those bottomlands administered by the National Park Service.<sup>2</sup>

Only a single Wisconsin wreck has been studied, the NOQUEBAY at Stockton Island, Lake Superior. The NOQUEBAY was a 205-foot wooden-hulled schooner barge, built at Trenton, Michigan in 1872, and lost in 1905. The National Park Service Submerged Cultural Resource Unit conducted a field survey of the site in 1984 as a cultural resource management project for the Apostle Islands National Lakeshore.<sup>3</sup>

While some archaeological work has been conducted in Lake Michigan waters (notably the South Haven excavation of a nineteenth century schooner), virtually none has taken place along the Wisconsin shore. Wisconsin's Door County peninsula is a location rich in submerged archaeological materials, none surveyed or studied. Some of the wrecks are accessible from shore, and many more by boat. Existing historical records document 219 vessel losses in the vicinity of Door County, dating from 1679 to 1946, with the majority of vessels lost between approximately 1860 and 1914.<sup>4</sup>

One of these sites, the schooner FLEETWING at Garrett Bay, is well known to local residents and divers, and serves as a popular site for fishing and sport diving. Located close inshore, it is very accessible for archaeological work. However, continuous looting in recent years has resulted in the loss of most of the schooner's moveable artifacts, including the windlass, barrel staves, and unsalvaged portions of her cargo of lumber.<sup>5</sup>

The schooner's anchors were removed by divers around 1956, along with associated ceramics, clay pipes, a lantern, and other small artifacts. A peavy hook and grating in the Gills Rock Maritime Museum (Gills Rock, Wisconsin) are attributed to the FLEETWING. One of the anchors is reported to reside at the Bank of Peoria, Peoria, Illinois. The windlass reported to be from the FLEETWING and many of the barrel staves were taken to On the Rocks Diver's Lodge, Gills Rock. During the 1960's, a furniture company is said to have hauled away two flatbed truckloads of wooden timbers from the site.<sup>6</sup> At present, divers continue to remove smaller scantlings and loose fastenings.

The site's exposed location subjects its shallower portions to continued wave action, as well as damage by ice shoves. The fact that the site is well known and is subject to a slow but continual process of human and natural

attrition identified it as an important location for a cultural resource assessment.

The resulting archaeological survey had two objectives; to document the extant wreckage, and to generate basic data on the construction techniques employed by Great Lakes builders. Being the first such archaeological study in the area, the construction data collected was hoped to lay the foundation for future work.

As the FLEETWING was built locally and engaged in local trade, it is a source of important information about Wisconsin shipping in the nineteenth century. The FLEETWING is from a slightly earlier date than the NOQUEBAY; she was also a full-fledged sailing vessel, considerably smaller in size (135.3 feet long).<sup>7</sup> The NOQUEBAY site provides much useful comparative data, albeit from a more recent, larger, towed vessel.

Additional comparative data has been gleaned from a study of the schooner ALVIN CLARK. The CLARK was built in Trenton, Michigan (as was the NOQUEBAY) in 1846 for J.P. Clark, and was lost off Chambers Island in 1864, approximately fifteen miles west-southwest of the location of the FLEETWING. She was salvaged virtually intact by divers in 1969, and unfortunately was allowed to disintegrate through lack of adequate funding.<sup>8</sup> Though

smaller than the FLEETWING and from an earlier period, she is still an invaluable source of marine architectural data.

The archaeological survey of the FLEETWING site (47DR168) was funded through East Carolina University's Program in Maritime History and Underwater Research. In addition to a grant for operational expenses, the University provided the project with surveying and diving equipment, and the services of the Underwater Research program archaeological assistant.

## FOOTNOTES

<sup>1</sup>Walter and Mary Hirthe, Schooner Days in Door County (Minneapolis: Voyageur Press, 1986), p. x.

<sup>2</sup>John Halsey, "Michigan's Underwater Archaeology Program," paper presented at 1985 Society for Historic Archaeology/ Conference on Underwater Archaeology, Boston, January 12, (unpublished manuscript, Lansing, Michigan), p. 1-2, 13; Peter Throckmorton, "Marine Archaeology", Oceanus 28 (Spring 1985):5.

<sup>3</sup>Toni Carrell, Submerged Cultural Resources Site Report: NOQUEBAY, Apostle Islands National Lakeshore, Southwest Cultural Resources Center Professional Papers, No. 7, (Washington, D.C.; U.S. Government Printing Office, 1986), pp. 1-5, 85, 87.

<sup>4</sup>Arthur and Lucy Frederickson, Frederickson's Chart of Ships Wrecked in the Vicinity of Door County, Wisconsin (Frankfort, Michigan: by the author, 1956).

<sup>5</sup>William S. Ellis, "A Kingdom So Delicious," National Geographic 135 (March 1969):357-359.

<sup>6</sup>Richard Boyd, personal communication, June, 1987.

<sup>7</sup>Enrollment 144, Port of Chicago, 7 May, 1881, Port of Chicago, Record Group 41, National Archives Regional Branch Center, Chicago.

<sup>8</sup>John Halsey, "Michigan's Underwater Archaeology Program," pp. 6-7; C.T. McCutcheon, Jr., "ALVIN CLARK: An Unfinished Voyage," Wooden Boat 52 (May/June 1983): 55-56; Peter H. Spectre, "The ALVIN CLARK: Challenge of the Challenge," Wooden Boat 52 (May/June 1983):61-65.



## CHAPTER I

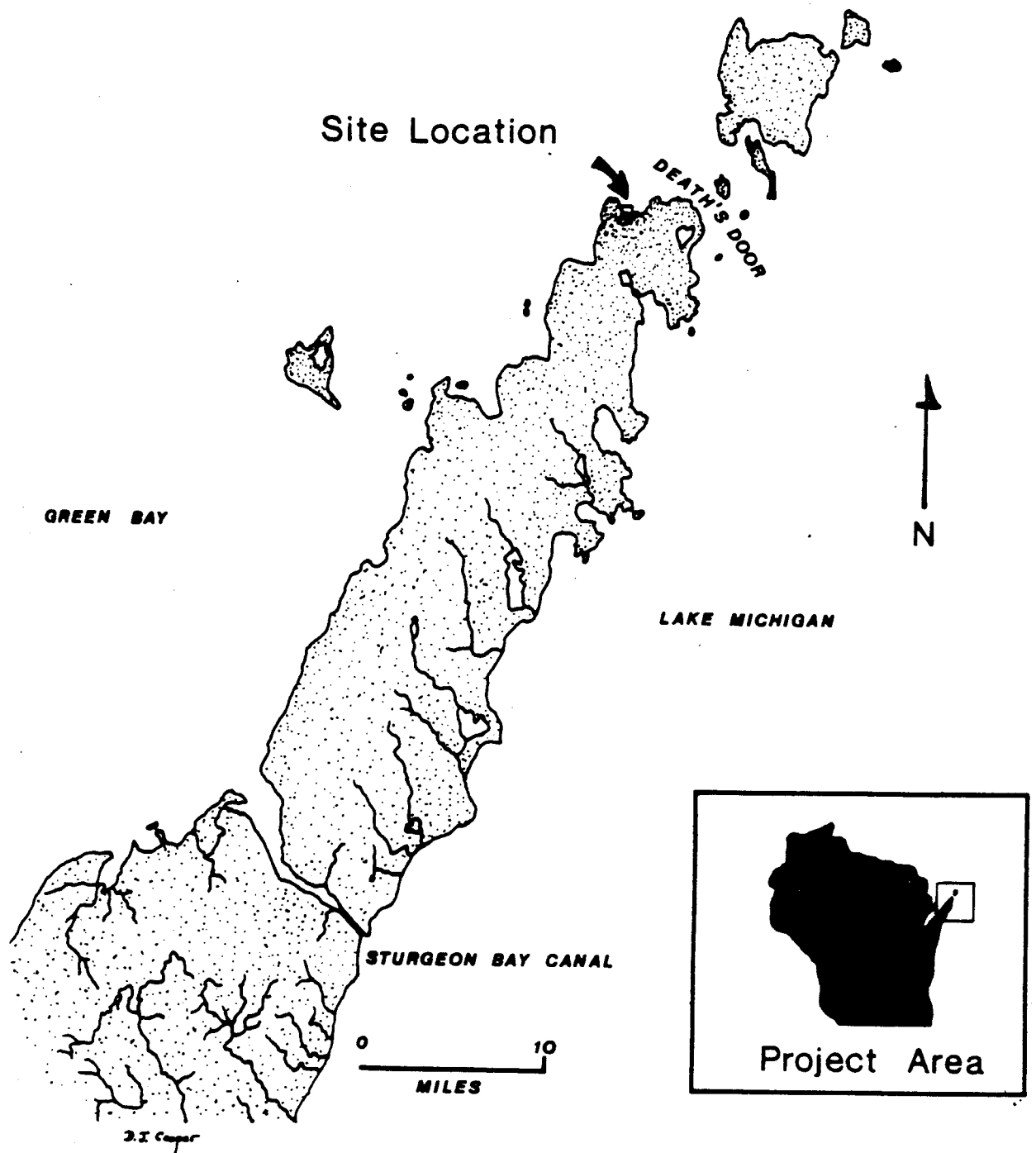
### SITE DESCRIPTION

#### Location

47DR168 is located in the southwest quarter of the northwest quarter of the northwest quarter of Section 1, T32N, R28E, Garrett Bay, Liberty Grove township, Door County, Wisconsin<sup>1</sup> (Map 1). The site covers an area approximately 83 by 270 feet, and is situated on a sloping bottom of stone, sand, and clay in between eleven and twenty-five feet of water, to the northeast of the Garrett Bay public boat landing.

#### Geography

Door County is a rocky peninsula jutting northeast out into Lake Michigan from northeastern Wisconsin. It is bounded on the east by the waters of Lake Michigan and on the west by the waters of Green Bay. It is approximately seventy-five miles long (including scattered islands) and between three and fifteen miles wide, with a total shoreline of about two-hundred miles.<sup>2</sup>



MAP 1

The peninsula consists of a high ridge of Niagara dolomite with a thin soil covering. The dolomite was formed in the Silurian period of the Paleozoic when a shallow sea covered parts of what is now Wisconsin.

Dolomite is formed from lime deposited in water from shells, corals, and precipitated by some plants. This lime forms calcium carbonate or limestone ( $\text{CaCO}_3$ ). Over millions of years magnesium (probably from groundwater) is added to form calcium magnesium carbonate or dolomite [ $\text{CaMg}(\text{CO}_3)_2$ ].<sup>3</sup>

The dolomite deposits range from 450 to 800 feet in thickness. As the dolomite is very erosion resistant, it forms the highlands characteristic of western Door County. The dolomite ridge in Door County rises abruptly from the waters of Green Bay on the peninsula's west side, and runs east in gently sloping ledges towards Lake Michigan, where the terrain is characterised by low, swampy shores. The peninsula was originally heavily wooded with numerous species of soft and hardwoods including beech, maple, ash, oak, ironwood, elm, pine, hemlock, cedar, basswood, spruce, balsam fir, tamarack, and poplar.<sup>4</sup>

Garrett Bay is located in Hedgehog Harbor, at the northern end of the Door County peninsula (Map 2). Hedgehog Harbor's western boundary is marked by Death's Door Bluff, and the eastern boundary by Table Bluff, the last headland

before Death's Door Passage. The two mile distance between the dolomite headlands constitutes the mouth of the harbor. Hedgehog Harbor faces due north into the waters of Green Bay, completely exposed to northern winds. Garrett Bay is situated in the western half of this harbor, separated from the eastern half by a small unnamed promontory.

#### Site Environment

Garrett Bay has a rocky beach of dolomite lake cobbles, characteristic of Door County's west shore. The bottom shelves down towards the mouth of Hedgehog Harbor and the open waters of Green Bay, and consists of dolomite cobbles and boulders from the water's edge to an approximate depth of ten feet. Here, the bottom shelves to a depth of approximately fifteen feet, and consists of sand, gravel, and scattered stone sloping to a depth of approximately twenty feet. At this depth, the bottom is composed of scattered stone, patches of pink and grey clay, gravel, and pockets of sand to a surveyed depth of thirty feet.

Mineralogically, lake bottom sediments are considered "immature". Sand grains (formed from quartz, feldspar, augite, hornblende, hypersthene, and olivine) exhibit a low degree of rounding; they are relatively angular. The lake



sands are derived from glacial drift. Lake gravels are formed from eroded glacial till and rock cliffs. Deep coring of the Lake Michigan bottom at a depth of 923 feet indicate that the lake bottom is formed of an overlying ten foot strata of grey clay, interspersed with color bands of jet black. This is underlain by a substrata of red clay.<sup>5</sup>

Lake waters are fresh, with 118 parts per million of dissolved solids, opposed to ocean water with 35,000 parts per million. The surface of Lake Michigan is located 580 feet above sea level, and is virtually without tidal action. Lake Michigan surface water averages 32 degrees Fahrenheit in the winter and can reach 70 degrees Fahrenheit in the summer. A spring overturn of lake water occurs when bottom and top temperatures equalize at 39.2 degrees Fahrenheit. Warmed surface waters are then allowed to mix vertically with colder bottom waters due to the actions of wind and currents. In summer, the surface water continues to warm, becoming less dense, leaving the cold bottom water to settle. No vertical mixing of waters occur in the summer. In fall, a cooling of the surface waters produces a fall overturn, again at 39.2 degrees Fahrenheit.<sup>6</sup>

In addition to great seasonal water temperature fluctuations, site 47DR168 is subjected to both wave and ice action. While studies indicate that the depth of wave

action is a function of wave length, the precise formula has not been agreed on. One study indicates that wave action effects the bottom to a depth equal to the wave length, another indicates that this effect only extends to a depth equal to half the wave length. It has also been asserted that the maximum depth of "vigorous wave abrasion" is approximately twenty-five feet. 47DR168 lies well within this zone. Additionally, winter ice can effect the site. Solid sheets are formed over the site in the winter, and inshore ice shoves can push floes across the surface of the site, effecting protruding wreckage.<sup>7</sup>

#### Site History

Garrett Bay contains at least two sites of archaeological interest, one terrestrial, the other submerged. The terrestrial site consists of several building foundations and trash middens from a nineteenth-century logging settlement. Submerged archaeological remains consist of scattered wooden wreckage popularly attributed to the nineteenth-century lumber schooner FLEETWING, run ashore in a gale in 1888, contemporary with the lumber settlement (Chapter IV). Also in the area of the wreck, though not included in the survey,

are at least two cobb-style pier cribs, presumably from the pier of Andrew Nelson (an early settler of Garrett Bay) reported to have existed in the vicinity at the time of the wreck.<sup>8</sup>

Two other shipwrecks are reported to have taken place in Hedgehog Harbor; the schooner ARDENT, loaded with coal, in 1880, and the schooner JAPAN, carrying liquor, in 1884.<sup>9</sup> The schooner BELLE LAURIE (61 feet long, 53.22 tons) is reported to have foundered in Garrett Bay 10 August, 1894, at a loss of \$300.<sup>10</sup> However this low cost seems to indicate that the vessel was only partially damaged. She was in fact pulled off and taken to Green Bay where she was dismantled and abandoned. No wrecks other than the FLEETWING are reported to be located in Garrett Bay itself. This was confirmed by Mr. Gordon Johnson, the grandson of the settler Andrew Nelson.<sup>11</sup>

Garrett Bay would likely have been inhabited by humans since prehistoric times; Door County has 167 recorded prehistoric sites at present. The Port des Morts site (47DR81), a prehistoric site placed on the National Register of Historic Places in 1976, is located 3 1/2 miles from Garrett Bay at Newport.<sup>12</sup> Extensive prehistoric village remains have been noted in several areas of the county, as well as burials, knapping sites, and agricultural mounds.



In the historic period, the northern end of the county was the home of the Potawatamie tribe, whose fishing grounds extended to Washington Island, and whose hunting grounds included much of the county. At least five indigenous peoples are known to have inhabited Wisconsin prior to the arrival of Europeans.<sup>13</sup>

The area later to become Wisconsin was explored by the French in the seventeenth-century and claimed as part of New France. Jean Nicolet was the first European explorer in Wisconsin, arriving in 1634. In 1654 a French trading expedition settled the area of the present city of Green Bay. The arrival of European trade goods and commerce began important changes in Wisconsin. However the French had little interest other than fur trading; few new trading posts were built, and the interior remained largely unexplored by Euro-Americans apart from the Jesuit missionaries.<sup>14</sup>

Following a series of colonial wars with the English throughout the seventeenth and eighteenth centuries, New France was lost in the Treaty of Paris (1763). This included Canada, and all lands east of the Mississippi River. A British Army post was established at Green Bay between 1761 and 1763.<sup>15</sup>

This land was, in turn, ceded by the British to the United States following the American Revolution as part of the Northwest Territory. According to the Treaty of Paris (1783) all British northwest posts were to be turned over to U.S. troops "with all convenient speed." The British were somewhat slow to leave, and the terms of the Treaty of Paris regarding northwest posts were reiterated in Jay's Treaty of 1794.<sup>16</sup>

Formal possession of the Wisconsin area was not taken until 1816, when the American army post of Fort Howard was built at Green Bay. The early forts were centers of society, commerce, and education, and preceded civilian settlement in the movement west.<sup>17</sup> The Black Hawk War in 1832 drove the Sac and Fox Indians from Wisconsin, opening up new lands. Additionally, it called attention to the rich territory around the Great Lakes, and sparked a good deal of immigration into Wisconsin, Illinois, and Indiana. Half of these immigrants came by water due to the cheap transportation, and an estimated 90-percent are said to have come from Europe.<sup>18</sup>

Despite failing western land speculation and the Panic of 1837 (which hindered investment in the territory) Wisconsin achieved her statehood in 1848. Her industries, than as now, centered around agriculture, lumbering, and

mining. The Civil War gave a great economic boost to Wisconsin's early growth, especially to her shipping industry (see Chapters II, III).<sup>19</sup>

The first known Euro-American settler in Door County was Increase Claflin, who settled at Little Sturgeon Point in 1835. He moved north to Fish Creek in 1844. Lumbering became an important business in the new state and the expanses of timber were sources of cordwood, railroad ties, telegraph poles, and fence posts. With no railroad and few good roads on the Door County peninsula, lake shipping was found to be the best form of transportation for early settlers. Therefore, settlements tended to grow up around harbors and piers.<sup>20</sup>

Agriculture included the cultivation of grains and hardy vegetables (squash, turnips, potatoes), as well as some fruit trees. The maples were tapped for maple syrup, and some hogs and sheep were kept by early settlers. Fishing was another important early industry; trout and whitefish were caught for salting, and sturgeon for smoking.<sup>21</sup>

Around 1877, a Danish immigrant, Andrew Nelson, purchased 600 acres of land at Garrett Bay from the Fox River Company. Nelson was born in Denmark in 1851, and sailed to America in 1872. He worked as a farmhand,

lumberjack, and railroadman before settling at Garrett Bay. He married Mary Christianson in 1877, and had nine children. The family built a small settlement at Garrett Bay. Two docks were constructed, and a store, lumber camp, and quarry were established. It was near one of the docks where the FLEETWING wrecked in 1888.<sup>22</sup>

## FOOTNOTES

<sup>1</sup>In the Wisconsin State Archaeologist's County Code File for cataloging archaeological sites the state code number is 47, the county code for Door is DR, and the site number is 168. Township, range, and section numbers are from the United States Geological Survey Map, Ellison Bay quad, 15 minute series.

<sup>2</sup>Hjalmar R. Holand, History of Door County; The County Beautiful (Chicago: S.J. Clarke Publishing Co., 1917), p. 5.

<sup>3</sup>Rex Peterson, Geography of Wisconsin, Madison, Wisconsin: College Printing and Typing Co., 1965), p. 55, 60.

<sup>4</sup>Holand, County Beautiful, p. 5; Charles I. Martin, History of Door County, Wisconsin (Sturgeon Bay: Expositor Job Print, 1881), p. 5.

<sup>5</sup>Jack L. Hough, Geology of the Great Lakes (Urbana: University of Illinois Press, 1958), pp. 66-67, 70.

<sup>6</sup>Ibid., pp. 3, 50, 60-61.

<sup>7</sup>Ibid., pp. 33, 49.

<sup>8</sup>Arthur and Lucy Frederickson, Ships and Shipwrecks in Door County, Wisconsin, 2 vols. (Sturgeon Bay, Wisconsin: Door County Publishing Co., 1961-63), II:70; Door County Advocate, 6 October, 1888.

<sup>9</sup>Arthur and Lucy Frederickson, Frederickson's Chart of Ships Wrecked in the Vicinity of Door County, Wisconsin (Frankfort, Michigan: by the author, 1959).

<sup>10</sup>Wreck and Casualty Chart, National Weather Bureau, Lake Marine Service, 1894, State Historical Society of Wisconsin Archives, Madison.

<sup>11</sup>Frederickson and Frederickson, Frederickson's Chart; Walter and Mary Hirthe, "Sail Vessels Built in Door County", Milwaukee, 1987. (Typewritten); Gordon Johnson, personal communication, August 1986.

<sup>12</sup>County Code File, State Archaeology Office, State Historical Society of Wisconsin, Madison.

<sup>13</sup>Larry Gara, A Short History of Wisconsin (Madison: The State Historical Society of Wisconsin, n.d.), p. 3.; Holand, County Beautiful, pp. 14-30; Martin, Door County, pp. 20-21.

<sup>14</sup>Gara, Short History, pp. 1, 5, 12.

<sup>15</sup>George Cuthbertson, Freshwater; A History and Narrative of the Great Lakes (New York: Macmillan Co., 1931), pp. 3-5, 16.

<sup>16</sup>Gara, Short History, p. 26, 29.

<sup>17</sup>Ibid., p. 41; Martin, Door County, p. 3.

<sup>18</sup>Gara, Short History, p. 46; Flint's History of the Mississippi Valley, 1832, cited by J.B. Mansfield, History of the Great Lakes, 2 vols. (Chicago: J.H. Beers and Co., 1899), II:183.

<sup>19</sup>Gara, Short History, pp. 68-69, 94, 118.

<sup>20</sup>Martin, Door County, p. 6-7, 10-13.

<sup>21</sup>Ibid., pp. 12-15.

<sup>22</sup>Commemorative Biographical Record of the Counties of Brown, Kewaunee, and Door, Wisconsin (Chicago: J.H. Beers and Co., 1895), p. 647; Door County Advocate, 6 October, 1888; Gara, Short History, p. 68; Martin, Door County, p. 63.

## CHAPTER II

### GREAT LAKES COMMERCE 1615-1900

The recorded history of water-borne commerce on the Great Lakes begins with the French explorers and traders of the seventeenth century. Though Jacques Cartier discovered New France (Canada) in 1534, the upper Great Lakes remained unexplored by whites until 1615 when Champlain discovered Lake Huron while exploring the French River region. The canoe was the major form of lake transportation for the first sixty-four years of French exploration. These were adopted from the native peoples of the region, and were constructed in the familiar fashion of birchbark laced onto cedar frames with spruce roots, using pine gum for caulking. The small craft were easily portaged and useful on narrow streams, but only carried one to two people.<sup>1</sup>

The French enlarged the canoe design to a length of thirty-three feet or more. These were known as "canot de maitre", or "grand canot". They were referred to by size as being five or six fathom canoes. Developed for

military and fur trade purposes, they had a capacity of from 4,000 to 8,000 pounds, including crew and cargo.<sup>2</sup>

Few if any innovations in shipping were made until 1678, when fur trading attracted a colorful and enterprising Frenchman, Rene Robert Cavalier Sieur de La Salle, a soldier, sailor, and explorer. Motivated by fears of Anglo-Dutch competition in the Great Lakes fur trade, La Salle sought to extend French occupation by establishing new post and forts, as well as stepping up the volume of trade. To assist French expansion, La Salle recognized the need for larger vessels, able to carry more furs.<sup>3</sup>

La Salle brought a small ship onto Lake Ontario, undertaking the first voyage on November 18, 1678. This small vessel was probably one of the four built at Fort Frontenac prior to 1678 for the trade between that fort and Niagara. These ships were most likely similar to an English pinnace in design, of about 45 foot length, 12 to 13 foot beam, and 6 foot depth of hold.<sup>4</sup>

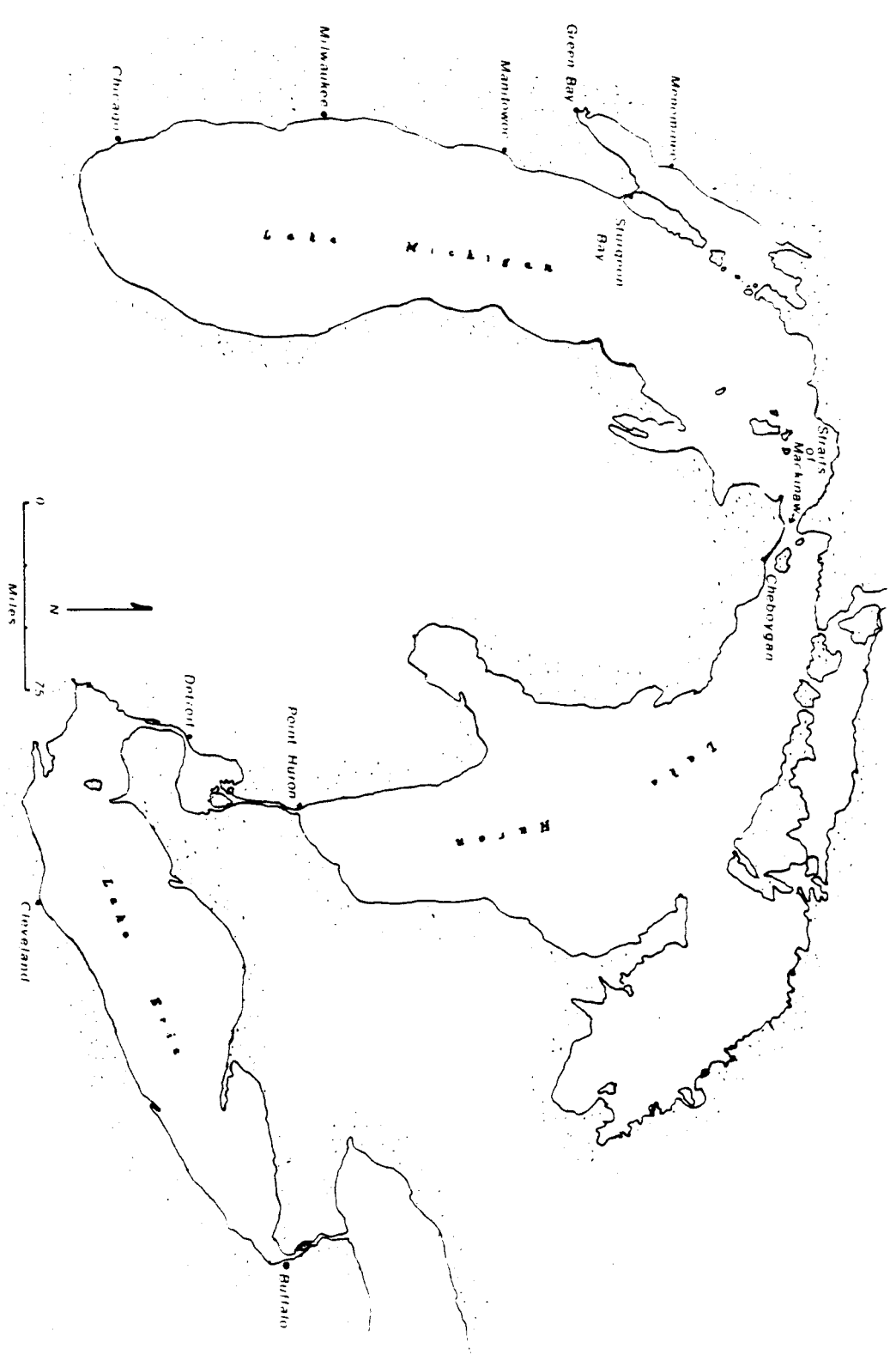
The following winter, a new ship was constructed on the Niagara River for La Salle. Named the GRIFFIN, she was built of green timber and was launched by late spring or early summer. It seems to have been similar in design to a Dutch galleot, with a high poop, rounded stern, and



the ability to carry heavy cargoes through shoal water. She was armed with five guns, and measured about sixty tons. Her dimensions were probably around 70 foot length, 16 foot beam, and 8 foot depth of hold.<sup>5</sup>

The GRIFFIN entered Lake Erie August 6, 1679 and headed uplake for Green Bay, through Lakes Huron and Michigan. Here she unloaded a cargo of supplies and shipwright's tools, and departed on September 18. She was never seen again, and her final resting place remains a mystery. La Salle himself was not on the vessel, and continued his explorations, entering the Illinois River in 1679, and founding Fort St. Louis in 1680.<sup>6</sup>

With the passing of the GRIFFIN, lake shipping came to a standstill for almost fifty years. Two schooners were built on Lake Ontario in 1726 for the Frontenac - Niagara trade, and by 1741, four vessels were recorded in service. A number of additional sloops and schooners were built by the British during the Seven Years War, but were captured and burned by the French at Oswego in 1756. However, Ontario vessels could not pass through to the upper lakes due to the Niagara Falls; the canoe returned to its position of prominence. Apparently, some other types of small craft began seeing use on the Great Lakes in the eighteenth century, including bateaux (large,



MAP 3

flat-bottomed, oared, poled, or sailed skiffs) and whaleboats.<sup>7</sup>

These small craft were not supplanted until 1762 when the British built two armed schooners, the HURON and the MICHIGAN, for military transport. In 1784 the British government granted permission to build and operate commercial ships on the Lakes. The forty-ton sloop BEAVER was launched in 1785, and saw service on Lakes Michigan, Huron, and Erie. The seventy-ton sloop OTTER of the Northwest Company was launched in the same year, and saw service on Lake Superior.<sup>8</sup>

The experiences of the eighteenth century indicated that the fore and aft rig was the ideal Great Lakes rig, both for merchant and naval vessels. Sudden lake squalls discouraged the use of square sails, which could not be taken in quickly. Additionally, the fore and aft rig was easier to work to windward, and could be handled by fewer men.<sup>9</sup> Economy was important on the frontier, and the ability to sail in any wind important on the lakes, with their frequent shoal waters and lack of sea room. The British Deputy-Surveyor reported in 1788;

Gales of wind or squalls rise suddenly upon the lakes, and from the confined state of the waters, or want of sea room (as it is called), vessels may in some degree be considered as upon a lee shore, and this seems to point out the necessity for their

being built of such a construction as will best enable them to work to windward. Schooners should perhaps have the preference as being safer than sloops.(10)

The schooner became the favored lake rig until the decline of sail on the Great Lakes. Lake vessels carried a large sail area in proportion to their hulls, as midsummer lake winds were uncertain, and often very light. Frequently, a square topsail was carried by sloops and schooners to augment the fore and aft sails while running before the wind. The gaff-rigged topsail schooner became the classic lake rig. A yard was mounted at the hounds (below the cross-trees) where a large course or "runner" was set. In later times a new lake innovation was used, the "raffee". This was a triangular topsail footed on the yard top and spread up to the mast truck.<sup>11</sup>

Another peculiarity of lake vessels was the almost universal use of a centerboard, the invention of which is often credited to a Royal Navy lieutenant named Schank, while constructing naval vessels in Boston in 1774 and on Lake Champlain in 1776. Built of oak planks and weighted with lead or iron, the centerboard, a cousin to the Dutch leeboard, was lowered through the bottom of a vessel to resist drifting to leeward while under sail. This greatly improved beating capabilities of vessels and had the further advantage that it could be raised in shoal water.

These boards were either set through the keel or offset to one side.<sup>12</sup>

Early models (called drop-keels) were somewhat unsuccessful. They were lowered vertically by a system of tackles into the trunk (the supporting box which held the board and prevented entry of water into the vessel). The drop-keel was very susceptible to careless handling; it could be accidentally dropped through the trunk into the lake, or be smashed if the vessel were to strike bottom, taking the trunk and part of the hull with it. Making the trunk water-tight was also problematic. The improved centerboard was set on a pivot in the trunk, and swung up or down on a winch. Striking bottom with the board would only pivot the board back up into the trunk.<sup>13</sup>

The schooner has been called the most important American sailing rig, both in greatest total tonnage built, and tonnage of cargo carried. They were used mostly for rapid, short voyages with a quick cargo turnover. Schooners dominated the American coasting trade, the West Indian trade, and the lumber and fishing industries. They saw use as slavers, privateers, and pirate ships. The efficiency of the rig and of the Baltimore clipper-type hull (which many schooners employed) is proven by the long existence of these

vessels, which were used commercially in the United States well into the twentieth century. Needing only a small crew and handy in confined waters, the schooner actually increased in use at a time when other rigs were disappearing.<sup>14</sup>

Merchant ships, even more than naval ships, were rigged for maximum efficiency, with a careful eye to profit and gain. The larger crew of a square-rigged vessel and the need for frequent maneuvering was simply inefficient, especially on the shorter lake runs. The schooner rig was much simpler to operate and maintain, which greatly cut costs of capital outlay, repair, and maintenance of the rig. Also, the windwardliness was an added bonus on the general east/west routes sailed on the Great Lakes. An east to west course meant that the captain would have to be beating for most of the way against prevailing west winds. The marked superiority in speed of the schooner on a beat was usually of greater value in the long run than the only slightly greater superiority of a square-rigged vessel running before the wind.<sup>15</sup>

The sharp Baltimore-clipper hull seems to have first originated in the southern United States and moved north in the mid-eighteenth century. Maryland and Virginia

specialized in this type of hull, called a "Virginia model" by contemporaries. Enemy commerce raiding on the colonial merchant marine placed a great premium on speed. The large merchant schooners developed from the smaller Virginia pilot boats into sixty-five to ninety-foot vessels with high bulwarks and relatively low displacement.<sup>16</sup>

Lake commerce saw a great increase following the American Revolution, and the entrance of the Americans into the western lakes region. In 1796, the British evacuated Detroit, Oswego, Fort Niagara, and Fort Michilimackinack. The American Fur Company entered Detroit and Mackinack to set up business. As American settlements were founded at Cleveland, Toldedo, Sandusky, and Buffalo, lake shipping became a proper business, attracting salt-water sailors, captains, and builders with higher than normal pay. The first American merchant ships were built mostly on Lake Ontario. The few built on Lake Erie were primarily schooners of fifty to one-hundred tons, used by the fur companies to compete with the British. These schooners were also used as coasting traders and for general cargo. While some sloop and ketch-rigged vessels were employed, most of the vessels used in the fur and general cargo trade were small gaff

topsail schooners. For coasting and fur trading, the ship's cabin served as a store, where Indians and settlers could come to sell furs and purchase manufactured goods and luxury items.<sup>17</sup>

Perry's victory at Lake Erie in 1812 freed American shipping from British attacks, but it also demonstrated to both sides the futility of further naval aggression in the north. The small navies used on the lakes could not protect a nation from invasion, but would only disrupt enemy shipping. The Rush-Bagot agreement in 1818 helped reduce friction by reducing naval forces on the lakes to a handful of gunboats.<sup>18</sup>

Peace brought extensive migration and colonization, with the attendant commerce from developing industry and agriculture. The fur trade was eclipsed by mining, agriculture, and lumbering. While fur trading had never required many ships, the new industries needed a fleet of merchant vessels for transportation. Navigational improvements such as canals helped lake products to reach a wider market. In addition, new propulsion methods began to revolutionize lake transport. The Canadians launched the steamer FRONTENAC in 1816, followed by the American ONTARIO in 1817, both on Lake Ontario. The American steamer WALK-IN-THE-WATER was built in 1818 for the upper



lakes, making runs between Detroit and Buffalo with stops at Cleveland and Erie, as well as occasional trips up to Mackinack. WALK-IN-THE-WATER was followed by the steamer SUPERIOR (1822) and HENRY CLAY (1824).<sup>19</sup>

A major boost in commerce came in 1826 with the opening of the Erie Canal between Buffalo and Albany. This route (about ten days by canal boat) connected the Great Lakes to New York City and the Atlantic Ocean via the canal and the Hudson River, opening up a crucial artery for incoming and outgoing trade. It accelerated western immigration by providing a cheaper water route to the lake ports and onto vessels for the west. The route only required one transshipment of cargo (from barge to lake vessel), a great improvement over older multiple transshipment methods. With the opening of the canal, Capt. Samuel Ward of the schooner ST. CLAIR took a cargo from Detroit to New York City, removing her masts for the canal passage. In 1829 the first vessel (Canadian schooner ANNIE & JANE) passed from Lake Ontario to Lake Erie via the new Welland Canal. Four of the five Great Lakes had been connected by navigable waterways.<sup>20</sup>

Steamboats began appearing on Lake Michigan around 1826, mostly as pleasure excursions to the scenic waters of Green Bay. The government began chartering steamers to

Lake Michigan in 1832 for the Black Hawk War, when these vessels made their first appearances in Chicago. Early work on a modest scale was begun on the port of Chicago as early as 1828, when soldiers cut through the bar at the mouth of the Chicago River to admit vessels from Lake Michigan. The harbor was improved by the national government in 1833, including a new entrance channel and several long lake piers. The cut was maintained by frequent dredging.<sup>21</sup>

In 1833, there were eleven steamers running on Lakes Michigan, Erie, and Huron. Of the 61,485 passengers they carried to and from Buffalo, 42,956 were headed west. Two trips were run to Chicago, and one to Green Bay. The following year forty-eight steamers were running on the same route, and with the increasing passenger trade west, regular steamer lines between Buffalo and Chicago began to run in 1839, contributing greatly to the settlement of the Midwest. 30,945 immigrants arrived in Wisconsin in 1840, and the total estimate of lake passengers in 1845 was 250,000, four-fifths of whom travelled on Lakes Erie, Huron, and Michigan. In 1850, 305,391 people immigrated to Wisconsin, arriving almost exclusively by lake vessels.<sup>22</sup>

However, great improvements were needed to make lake transport safer. Lighthouses, buoys, and other navigational aids needed to be established on the many hazardous reefs and islands, harbors needed to be improved, and life-saving service stations were a necessity. Unfortunately, many eastern and southern congressmen felt improvements in lake navigation were of local interest only, and refused to allocate federal funds to benefit the Great Lakes region. As a result, lake losses were high, especially along Lake Michigan's shores with its few sheltered harbors. Paying heavy freights due to high marine insurance, a Milwaukee merchant wrote in 1840, "The steamer Champlain, the brig Queen Charlotte, and four or five schooners, are ashore, and some of them total wrecks, and what a pity it is that they were not all loaded with Senators and members of Congress."<sup>23</sup>

President Polk vetoed a general harbor appropriation bill for \$500,000 in August, 1846 prompting outraged lakemen to rally in Chicago the following year for a river and harbor convention. The 2,315 delegates represented nineteen states, and included such notables as Abraham Lincoln and Horace Greeley. The Convention was able to bring the issue of lake improvement to a level of national interest, which produced several federal river and harbor

bills in succeeding years for the allocation of national funds to inland commerce. None the less, to repair the Chicago harbor piers in 1858, the government dredge was commandeered to dig sand, the sale of which funded the harbor work.<sup>24</sup>

Another improvement was being made at this time, but one which would in a large measure doom lake-borne commerce; the railroad. The first railway locomotive had arrived in Chicago in 1837 (ironically by schooner), and by the 1850's, railroad lines skirted much of the lake shores, connecting the major points of commerce. Initially, the railroads were used for passenger transport, as they were not subject to the winter close of navigation (November to April) that hampered lake-borne commerce. However, with additional lines and better equipment, railroads began to take a larger share of the bulk transportation trade.<sup>25</sup>

While the steamers carried immigrants to the new urban centers, much of the schooner trade in the pre-Civil War period was characterized by the supply of small lakeshore settlements. Typically, manufactured goods would be brought from points east, and the raw materials and produce wrested from the forests and cold lake waters were shipped back to the urban centers. Perhaps typical

of these small trading schooners is the GAZELLE, Capt. Bailey.<sup>26</sup>

The GAZELLE was built in 1836, probably at Perrysburg, Ohio. Her dimensions were 67 feet long, 19 1/2 feet beam, and 6 1/2 foot depth of hold, and she was rated at 75 tons. In design she was probably similar to the small gaff-rigged trading schooners prevalent on the lakes after the War of 1812.<sup>27</sup> An examination of her log reveals the nature of Great Lakes trade between the downlake ports and the Lake Michigan settlements.

On 14 June, 1838 Bailey shipped supplies at St. Helena for the fishing camp at Death's Door, recording the following in the combined log/account ledger:

Shipped for T. Flecher

2	Bbls	salt	
143 1/2	Bbls.	(empty)	[sic]
10	Bbls.	(lines)	+
1,000	feet	lumber	
1	boat	+	

E. Matterson

Shipped from St. Helena

40	Bbls. freight	-	10.00
2	fishboats @ \$4	-	8.00
2	passengers \$4	-	8.00

---

20.00 [sic]

Lewis Martin

Shipped 6 Bbls	-	1.50
1 boat \$3	-	3.00

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4.50

On June 18, Flecher, Madison [sic], and Martin were landed at Death's Door, along with their barrels, salt, boats, lumber, lines, and "hookstones". Martin and Matterson each bought additional fish barrels and salt from Bailey, and freighted on their accumulated salted catch, the value of which was written off their debits to Bailey. The fish were later sold in Detroit.<sup>28</sup>

On a typical run, the GAZELLE would obtain supplies in Detroit or Cleveland for the fishermen, such as coffee, pork, tobacco, stoves, nets, lines, crockery, sundries, leather, cider, twine, salt, beans, potatoes, sugar, flour, hay, oats, whiskey, beer, lard, butter, and soap. The schooner would then proceed past Point Huron and Thunder Bay to Mackinaw and St. Helena, where merchants would supply Bailey with empty barrels, salt, lumber, boats, and fishing gear. This would be sold to the fishermen at Death's Door and at the Twin (Two) Rivers camp of J.P. Clark. The salted fish was taken back downlake to be sold, the value of which was written against the fishermen's debits. It is possible that these men saw little actual cash, all the transactions being kept in the GAZELLE's not-so-neat account book. In addition to the Euro-American fishermen, Clark employed

50 to 100 Indians in his operations at Two Rivers and Fisherman's Bay (Whitefish Bay). The hay brought by the GAZELLE indicates that some animals were being used there as well, perhaps horses or oxen for logging. These too were probably brought in by schooner.<sup>29</sup>

John Pearson Clark had entered the fishing business around the Maumee River in 1826 at age eighteen, later expanding into northern Lake Michigan. The schooner ALVIN CLARK (owned by Clark) was named after his son, and helped carry the supplies and fish for his camps, much like the GAZELLE.<sup>30</sup>

The advent of larger lake carriers paralleled increased settlement and production in the region, and the need for even greater transportation of bulk cargoes. Lake Superior began attracting settlers in the 1840's, when attempts were made to portage small schooners over the snow around Sault Ste. Marie. The opening of the Soo (Sault Ste. Marie) canal in 1849 allowed the shipping eastward of the area's rich iron and copper ore deposits, which had formerly taken a torturous wagon route to Sault Ste. Marie. In this year, all five of the Great Lakes were finally connected by navigable waterways. Enlargements in the Welland Canal in 1846 and in the St. Lawrence River passage allowed larger vessels to move

through the locks. In 1849, the barkentine EUREKA set sail to California via the Welland and St. Lawrence canals with a load of gold rush prospectors from Cleveland.<sup>31</sup>

The demand for larger vessels effected not only steamers, but the sailing vessels as well. More than ever, economic and environmental conditions were proving the schooner rig to be the most efficient Great Lakes rig. Ship, brig, and bark rigs were very rare on the lakes, particularly after mid-century. The brigantine and barkentine saw some of their most extensive early use on the Great Lakes, but the construction of larger, heavily constructed schooners eclipsed the construction of most alternate rigs. In addition to the previously mentioned advantages of schooners, with the advent of mechanical bulk unloading equipment, it was found that the running gear and booms of schooners were much easier to swing out of the way than the abundant and vexing rigging of a square-rigger.<sup>32</sup>

From around 1850 on, full, three-masted schooners with small crews began appearing as the most typical American coasting trader. These vessels were either deep-draft keel vessels, or shallow draft centerboard vessels. With the construction of the CHALLENGE in 1852



at Manitowoc, Wisconsin, a new type of schooner was seen on the lakes, the centerboard clipper, built much along the lines of the salt-water clippers. The CHALLENGE, built by William W. Bates, was characterized by a sharp bow, full hull, flat-bottom, and great speed (reportedly thirteen knots). At this time, many of the earlier two-masted schooners experienced a rig change to three masts, while brigs and barkentines were changing to the schooner rig.<sup>33</sup>

By the 1870's, the deep-draft centerboarder appeared to have taken over the coasting trade as the most efficient all-around rig and hull type. Four-masted schooners made their appearance in the 1880's. The centerboard was in common use even in vessels of 180 to 240 feet in length.<sup>34</sup>

Many smaller craft were used for fishing and lightkeeping, and much smuggling of Canadian whiskey and American tobacco was conducted across the international waters in luggers, ketches, sloops, and yawls.<sup>35</sup>

The restrictions of the St. Lawrence and Welland canals brought about another type of lake vessel, the canaller. The Welland Canal locks (after 1846) allowed passage of vessels with a 150 foot length, 26 foot beam, and 9 foot draft. The St. Lawrence canal locks allowed

vessels of 100 foot length, 20 foot beam, and 5 foot draft. Eager to make every inch count when inside the restricted locks, canallers were built with straight stems, flat bottoms and sterns, short bowsprits, and highly canted jib-booms. These vessels with their boxy appearance were readily identified as "canallers".<sup>36</sup>

Lake vessels were almost exclusively framed and planked in white oak, and stayed in their best condition for about fifteen years. The bottom planks were usually 4 by 8-inch white oak, and the side planking between 6 and 8 inches wide. The deck beams were normally of 12 inch-square oak, overlaid with deck planking of 6 by 4-inch white pine. Hatch coamings were also of oak. Keelson timbers usually measured approximately 12 by 12 inches; the entire keelson assembly could measure as large as 4 feet wide by 5 feet high. Ceiling consisted of 4 by 12-inch oak. The hull planking was caulked with oakum fiber (three strands of oakum and one strand of cotton per seam). Ship carpenters did the planking and framing, ship joiners did the cabin work, caulkers spun and hammered the oakum, mast makers shaped the spars, and riggers spliced and set the rigging.<sup>37</sup>

Many of these larger vessels were being built specifically for bulk cargo carrying; general merchandise

hauling seems to have been a matter of serendipity for the large schooners. Common bulk cargoes were ore, timber, grain, and coal.<sup>38</sup>

Coal was shipped west from Erie and Cleveland to fuel the western lake cities and towns, as well as steamboats. Iron ore shipments came from the Marquette, Menominee, Gozebic, Vermilion, and Mesaba ranges. Most shipments went east via Lake Superior to the iron foundries of Ohio and Pennsylvania; little iron ore was shipped on Lake Michigan, save for ore from Escanaba.<sup>39</sup>

Lake Michigan commerce consisted mostly of grain and timber, and it is these commodities that touch most heavily on the activities of the schooner FLEETWING (Chapters III and IV). The inland lake route greatly facilitated the growth of the grain trade by providing cheap and ready transportation to eastern markets. The grain trade contributed heavily to the rise of such lake cities as Cleveland, Toledo, Detroit, Chicago, and Milwaukee. However, much of the focus of grain production moved west after 1873, when Duluth-Superior became the principal grain ports.<sup>40</sup>

Wheat was the primary grain shipped until around 1845, after which corn became a secondary grain cargo. Shipments of oats (of tertiary importance) came after

1850, while barley and rye were shipped in rather insignificant quantities. Corn and oats were destined feed for Eastern livestock, and wheat was shipped bulk to New York to be milled into flour. Prior to 1850 much of the wheat was milled in the west; after 1850, most of the shipments were bulk wheat for the eastern mills. Foreign exports of grain were not of great importance. Prior to 1868, less than 15-percent of the total national crop was exported, and between 1868 and 1877 this never rose above 30-percent.<sup>41</sup>

The first grain hauled on Lake Michigan came from Grand Rapids, Michigan in 1836, and was carried by the brig JOHN KENZIE. Early cargoes were handled by bucket, and took from three days to a week to unload. Buffalo's first grain elevator, built in 1837, was horse powered. Unsuccessful, the builder Mahlon Kingman disgustedly remarked to another grain warehouseman, "Irishman's backs are the cheapest elevators ever built." Chicago's first elevator was built in 1839. It was hand operated with buckets (later horses were used). The first mechanical unloader/elevator in Buffalo was built over the winter of 1842-1843. It could store 55,000 bushels, and transfer 15,000 bushels per day. In 1848 Chicago built her first steam-powered elevator.<sup>42</sup>

The mechanization of grain handling was important to the inexpensive and quick shipment of the commodity. Bagging grain required costly filling, weighing, handling, and hoisting, as well as the cost of bags (at between two and four cents each, a not inconsiderable sum when 5,000 might be needed for one cargo). The elevator could easily carry bulk grain up out of the holds (always the more difficult part of the shipping) and even protected the grain from rain during offloading.<sup>43</sup>

Most of this grain was shipped east by commission merchants in unscheduled sailing vessels . Before 1840, a grain fleet vessel averaged 125 tons, with a capacity for 4,000 bushels. By 1848 the average vessel capacity had risen to 12,000 bushels, and continued upwards as increasingly large grain carriers were built. It more than doubled by 1857 (25,000 bushels), and by 1873, average vessel capacity had reached a dramatic 70,000 bushels. Vessels headed east with grain or provisions (barrelled meat was almost a type of grain export, as the hogs and cattle were fed on western grain) and returned west with such bulk cargoes as coal, salt, or plaster. It took eight to ten days to sail between Chicago and Buffalo with a fair wind, and only half that time by steamer.<sup>44</sup>

Increasingly, the steam-propellor absorbed a larger share of the grain haulage from sailing vessels. The engine position on a propellor (aft and below) lowered the vessel's center of gravity, allowing for deeper holds and greater cargo capacity than on the side-wheel boats. With their higher speeds, propellers commanded higher freights than the sailing vessels. Freights were always subject to supply and demand, therefore grain freights were lowest in the summer, and peaked during harvest time. Before 1860, the freight for grain between Chicago and Buffalo stood between 10 and 15 cents per bushel, with propellers a fraction of a cent higher than sail. After 1858, the larger grain vessels (both propellor and sail) received between 4 and 7 cents per bushel.<sup>45</sup> Following the Civil War boom, freights continued to drop (Table 1).

The higher operating expenses of the propellers was offset by their greater cargo capacity. In 1871, grain barge towing was begun on the lakes, using tugs or steam barges for power, which created combined capacity tows of 100,000 to 120,000 bushels. As the number of towed vessels (called "consorts") multiplied, strings with a combined capacity of 200,000 to 250,000 bushels began to appear. Unable to compete with the efficient

TABLE 1  
LAKE GRAIN FREIGHTS; CHICAGO TO BUFFALO  
WHEAT PER BUSHEL  
1857-1898

Annual Average	Cents	Annual Average	Cents
1857 . . . .	9.89	1878 . . . .	3.07
1858 . . . .	3.76	1879 . . . .	4.74
1859 . . . .	5.08	1880 . . . .	5.76
1860 . . . .	9.89	1881 . . . .	3.44
1861 . . . .	11.53	1882 . . . .	2.50
1862 . . . .	10.49	1883 . . . .	3.41
1863 . . . .	7.51	1884 . . . .	2.18
1864 . . . .	9.58	1885 . . . .	2.02
1865 . . . .	9.78	1886 . . . .	3.68
1866 . . . .	12.34	1887 . . . .	4.13
1867 . . . .	6.67	1888 . . . .	2.56
1868 . . . .	7.14	1889 . . . .	2.51
1869 . . . .	6.81	1890 . . . .	1.96
1870 . . . .	5.88	1891 . . . .	2.38
1871 . . . .	7.62	1892 . . . .	2.19
1872 . . . .	11.46	1893 . . . .	1.66
1873 . . . .	7.62	1894 . . . .	1.27
1874 . . . .	4.03	1895 . . . .	1.92
1875 . . . .	3.42	1896 . . . .	1.63
1876 . . . .	2.90	1897 . . . .	1.56
1877 . . . .	3.72	1898 . . . .	1.53

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Source: J.B. Mansfield, *History of the Great Lakes*, 2 vols. (Chicago: J.H. Beers and Co., 1899), 1:535.

consort system, and unable to tow barges, many sailing vessels were forced into participating in the system as the unglorious tow-barges or schooner-barges. Schooner barges were modified schooners with a cut-down sailing rig, some converted from sailing ships, others built specifically for towing. One sailing captain, reduced to piloting a schooner-barge, wryly compared his responsibilities to "running a wheelbarrow."<sup>46</sup>

Technology effected other aspects of the grain trade as well. The development of the telegraph shifted the marketing of grain and flour from the East to the West, as western marketers were put in closer touch with eastern purchasers, eliminating the middleman brokers. The West was also able to more quickly react to price fluctuations in eastern markets. Coincidental with this was the railroad, which was able to ship the product more directly to the consumer, again eliminating the middlemen as well as the transhippers at Buffalo.<sup>47</sup>

Chicago received her first all-rail connection with the east in 1852. However, a combination lake-rail route was found to be more economical, with lake ships delivering cargoes to a rail terminus in the east. The all-rail route was used for grain transport largely in the winter when navigation was closed (there was some



fear of spoilage with stored grain, as well as higher prices to be had) and then only barrelled flour was shipped. As changes in track gauge along the way required several transshipments, movement of bulk grain along this route was impractical, which left lake ships in command of the bulk grain trade for the time being. An expansion in the rail system during the Civil War, (including new spurs, and standard gauge rails of steel) permitted heavier loads without transshipment. In the winter of 1867, the first bulk grain went all-rail from Chicago, and in succeeding years, the railroad captured an increasing share of the grain transport trade, especially after 1873<sup>48</sup> (Table 2).

Although lake shipping of grain continued, competition from the railroads was adversely effecting the small shipper and sailing skipper. To make matters worse, many of the fast propellers were being built or bought by the railroad companies for use on the lake-rail route. As big business arrived, it edged out the captain-owners of schooners, with their inferior equipment and financing. Iron, steel, and coal firms also entered the shipping business. Proud grain schooners found themselves begging for cargoes of lumber, working as schooner-barges, or rotting at the wharves.<sup>49</sup>

TABLE 2  
GRAIN AND FLOUR SHIPMENTS FROM CHICAGO  
1860-1895

	Flour (Barrels)			Wheat (Bushels)		
	% Lake	% Rail	Total	% Lake	% Rail	Total
1860	34.9	65.1	626,823	96.9	3.1	12,195,123
1865	83.2	16.8	1,243,540	98.8	1.2	10,097,642
1870	36.7	63.3	1,563,553	83.6	16.4	16,050,768
1875	14.9	85.1	2,201,226	72.9	27.1	22,017,663
1880	18.9	81.1	3,675,402	77.8	22.5	21,427,389
1885	12.7	87.3	5,102,424	49.7	50.3	10,933,005
1890	44.7	55.3	3,762,741	70.2	29.8	9,919,660
1895	33.1	66.9	2,389,115	70.0	30.0	18,925,437

Source: Mansfield, Great Lakes, 1:531-532.

Lumber was a commodity always in demand, and was a convenient cargo for many lake schooners. Chicago first began importing lumber in 1833, and always represented a huge market for building materials. By 1884-1885 there were around 500 steamers and schooners in the Great Lakes lumber trade, hauling approximately 8,000 cargoes per year. In the lumber trade, tow barges came into even earlier use than in the grain trade, being first employed in 1861.<sup>50</sup>

Cheap transportation had always been the major problem in the lumber industry. In 1913 it was estimated that, "transportation of forest products to mill or market represents 75-percent or more of the total delivered cost of raw materials exclusive of stumpage value." The cost for operations were relatively minor. In Lower Michigan and Minnesota between 1870 and 1900 the acquiring and transporting of timber ran between 52 and 73-percent of the total cost. In costs for sawing and piling, transportation still amounted to 32 to 56-percent of the total. These costs still exclude final shipment to market. Therefore, "[r]egardless of time, place, or type of operation the transportation of logs was a major pivot around which the entire manufacturing process was forced to revolve."<sup>51</sup>

Lumbering was characterized by seasonal work. In fall, the lumber camp sites were located and the buildings constructed. In winter (with snow of sufficient depth) the trees were cut and hauled down to the rivers, the snow and frozen ground making transportation easier with bobsleds and teams. In the spring, at high water, the logs were driven down river to lakeside mills for sawing and shipping. Driving and sawing continued all summer until the available supply of cut timber was exhausted.<sup>52</sup>

The market was subject to frequent fluctuations. While overproduction could reduce prices, transportation problems could lead to big holdups and losses for the lumbermen. A warm winter with no snow meant the harvest could not leave the forests, and a dry spring and low water could prevent the drive from reaching the mills.<sup>53</sup>

In Michigan, Wisconsin, and Minnesota white pine was the chief timber harvested. Soft and easily worked, it was used for much of the building on the frontier. The tall straight trunks made beautiful masts and spars for ships, and the clear planks were also used for decks. Michigan's Upper Peninsula was estimated to have had an original 10 million acres of forest; 4,750,000 in hardwood, 2,500,000 in spruce and fir, 1,600,000 in pine,

and 1,400,000 in conifer swamp. The best lumbering regions were the Manistique, Escanaba, and especially the Menominee River valleys.<sup>54</sup>

Improvements in milling equipment after mid-century helped increase the output of lumber. Upright saws were replaced by steam powered circular saws or gang saws capable of producing four to six boards at a time. By 1856 Chicago was the main U.S. lumber wholesaler. In 1869 the lake states produced 2 3/4 billion board feet of pine, in 1879, 5 billion board feet and by 1889, 7 billion board feet. Michigan reached her peak production in the mid-1880's, and by 1900 most of the accessible pinelands in Wisconsin and Michigan had been logged out.<sup>55</sup>

The sawmill was usually located at a river mouth, with a harbor for the lake vessels which would carry the lumber to market. However, as loggers penetrated further inland, it became uneconomical to make river drives over the increasing distances. Lumber companies were subject to frequent litigation for damming and flooding activities along the rivers, which resulted in the destruction of crops and farms. A drive was also subject to a loss or "shrinkage" rate of about 10-percent due to sinking, stranding, and theft. Thus, an entire drive's

worth was lost every ten years, an incredible amount of timber. Lengthening the drive only meant a higher shrinkage, and could effect more farms prompting additional lawsuits.<sup>56</sup>

Railroads again came to the rescue at the expense of lake shipping. Railroads were able to penetrate the interior, and move lumber from the camp directly to market. Sawmills were established directly at the camps, eliminating the drive, transshipment to lake vessels, and wholesale distributor. The mills could deal directly to the purchaser on a consignment basis. Railroads were not as cheap as rafting (initially) as special spurs had to be constructed, and lumber firms often had to lay their own track where regular lines did not run, or charged unreasonable freights. Monopolies were enjoyed by many frontier railroads, resulting in sawmills being at the mercy of a single carrier. Due to these problems, railroads never completely replaced log driving to lakeside mills, but the increased competition in transportation added extra difficulties to the already-pressured lumber schooners<sup>57</sup> (Tables 3 and 4).

The decline in the lumber industry, the last major refuge of the lake schooner, was to a great degree the passing of the age of sail on the Great Lakes.

TABLE 3  
LUMBER FREIGHTS TO CHICAGO  
PER 1,000 FEET

	Alpena	Manistee	Menominee	Ashland
1877	\$1.31	\$1.27	-	-
1878	1.14	1.34	\$1.46	-
1879	-	1.77	1.87	-
1880	2.22	2.12	2.27	-
1881	-	2.18	2.17	-
1882	1.92	1.78	1.80	-
1883	2.01	1.85	1.85	-
1884	1.74	1.70	1.59	-
1885	1.64	1.46	1.54	-
1886	1.89	1.58	1.66	\$2.12
1887	2.53	1.94	2.11	3.15
1888	1.90	1.49	1.57	2.73
1889	1.59	1.42	1.40	2.42
1890	1.74	1.58	1.66	2.51
1891	1.69	1.59	1.59	2.44
1892	1.81	1.62	1.67	2.91
1893	1.61	1.46	1.48	2.36
1894	1.41	1.32	1.33	2.00
1895	1.36	1.22	1.27	2.18
1896	1.16	1.14	1.20	1.85
1897	1.18	1.13	1.10	1.67

Source: Mansfield, Great Lakes, 1:523.

TABLE 4  
LUMBER RECEIPTS AT CHICAGO  
1859-1897

	% Lake	% Rail	Total (1,000 feet)
1859 . . . . .	100.0	0.0	299,301
1860 . . . . .	97.0	3.0	262,494
1861 . . . . .	94.5	5.5	249,308
1862 . . . . .	96.5	3.5	305,674
1863 . . . . .	95.0	5.0	413,301
1864 . . . . .	95.7	4.3	501,592
1865 . . . . .	94.9	5.1	647,145
1866 . . . . .	94.2	5.8	730,057
1867 . . . . .	94.0	6.0	882,661
1868 . . . . .	93.9	6.1	1,028,494
1869 . . . . .	97.0	3.0	997,736
1870 . . . . .	96.1	3.9	1,018,998
1871 . . . . .	94.7	5.3	1,039,328
1872 . . . . .	85.9	14.1	1,183,659
1873 . . . . .	90.9	9.1	1,123,368
1874 . . . . .	93.7	6.3	1,060,088
1875 . . . . .	94.2	5.8	1,147,193
1876 . . . . .	93.4	6.6	1,039,785
1877 . . . . .	94.0	6.0	1,006,452
1878 . . . . .	92.5	7.5	1,180,586
1879 . . . . .	92.0	8.0	1,469,878
1880 . . . . .	91.0	9.0	1,561,779
1881 . . . . .	88.2	11.8	1,878,922
1882 . . . . .	88.5	11.5	2,117,545
1883 . . . . .	88.3	11.7	1,909,910
1884 . . . . .	88.4	11.6	1,822,315
1885 . . . . .	84.7	15.3	1,744,892
1886 . . . . .	81.9	18.1	1,742,984
1887 . . . . .	77.5	22.5	1,880,168
1888 . . . . .	78.7	21.3	2,066,927
1889 . . . . .	75.8	24.2	1,909,443
1890 . . . . .	70.0	30.0	1,941,392
1891 . . . . .	66.4	33.6	2,045,418
1892 . . . . .	65.5	34.5	2,203,874
1893 . . . . .	60.0	40.0	1,600,677
1894 . . . . .	68.8	31.2	1,562,527
1895 . . . . .	65.5	34.5	1,638,130
1896 . . . . .	60.6	39.4	1,286,643
1897 . . . . .	65.2	34.8	1,406,580

Source: Mansfield, Great Lakes, 1:521.



Metal-hulled steamers and railroads were left to fight for the remaining cargoes, and the schooners became barges or went to the boneyards. However, the boom in lake transportation was significant in that it helped both in settling the Midwest, and in giving the region cheap transportation for its raw materials. The Great Lakes transportation route provided the new communities with manufactured goods and the purchasing power to buy them. One scholar wrote of lake commerce,

The development of the interior of the North American continent displayed, in effect, a certain similarity to the earlier development of the American colonies on the seaboard: the exchange of products via the Great Lakes aided in the incorporation of the West as a part of the American economy just as the exchange of products via the Atlantic Ocean had facilitated the interior of Western civilization to the shore of the New World.(58)

Clearly, the inland lake route and the vessels that sailed it were crucial in the development of the American heartland.

## FOOTNOTES

<sup>1</sup>George A. Cuthbertson, Freshwater; A History and Narrative of the Great Lakes (New York: Macmillan Co., 1931), pp. 3, 5, 7-9.

<sup>2</sup>Ibid., pp. 12-14; J.B. Mansfield, History of the Great Lakes, 2 vols. (Chicago: J.H. Beers and Co., 1899), I:387-388.

<sup>3</sup>Cuthbertson, Freshwater, pp. 16, 18-19.

<sup>4</sup>Ibid., pp. 40-43.

<sup>5</sup>Ibid., pp. 32, 44-46.

<sup>6</sup>Ibid., pp. 34-38.

<sup>7</sup>Ibid., pp. 50-51, 54-60, 85-88; Mansfield, Great Lakes, I:390.

<sup>8</sup>Cuthbertson, Freshwater, pp. 125-128.

<sup>9</sup>Ibid., pp. 58, 128.

<sup>10</sup>Report of Deputy Surveyor General Mr. Collins to Lord Dorchester, cited in Cuthbertson, Freshwater, pp. 129-130.

<sup>11</sup>Cuthbertson, Freshwater, pp. 128-129; Mansfield, Great Lakes, I:233.

<sup>12</sup>Cuthbertson, Freshwater, pp. 236-237.

<sup>13</sup>Howard I. Chapelle, The History of American Sailing Ships (New York: Bonanza Books, 1982), p. 166; Cuthbertson, Freshwater, p. 237.

<sup>14</sup>Chapelle, Sailing Ships, pp. 158, 219-220.

<sup>15</sup>Cuthbertson, Freshwater, pp. 228-230; Walter and Mary Hirthe, Schooner Days in Door County (Minneapolis: Voyageur Press, 1986), p. vii.

<sup>16</sup>Chapelle, Sailing Ships, pp. 221-222, 230.

- <sup>17</sup>Cuthbertson, Freshwater, pp. 134-137, 233.
- <sup>18</sup>Ibid., pp. 188-189, 201-202, 206.
- <sup>19</sup>Ibid., pp. 202, 205, 208, 214-218.
- <sup>20</sup>Ibid., pp. 213, 218-220.
- <sup>21</sup>Richard Hartshorne, "The Lake Traffic of Chicago" (Ph.D. dissertation, University of Chicago, 1924), p. 17; Mansfield, Great Lakes, I:184.
- <sup>22</sup>Mansfield, Great Lakes, I:184-185, 188-189.
- <sup>23</sup>House Miscellaneous Documents, No. 236, 26 Congress, 1st session, cited by Thomas P. Odle, The American Grain Trade of the Great Lakes, 1825-1873 (Ph.D. dissertation, University of Michigan, 1951), pp. 105.
- <sup>24</sup>Mansfield, Great Lakes, I:201-203; Odle, Grain Trade, pp. 106-108, 115.
- <sup>25</sup>Mansfield, Great Lakes, I:191.
- <sup>26</sup>Log of the Schooner GAZELLE, with notes by Charles Harvey Roe, State Historical Society of Wisconsin Archives, Madison, n.p.
- <sup>27</sup>Ibid., n.p.
- <sup>28</sup>Ibid., Log entries for 14, 18 June 1838.
- <sup>29</sup>Ibid., n.p.
- <sup>30</sup>C.T. McCutcheon, Jr., "The ALVIN CLARK: An Unfinished Voyage," Wooden Boat 52 (May/June 1983):56.
- <sup>31</sup>Cuthbertson, Freshwater, pp. 235, 248-249.
- <sup>32</sup>Ibid., pp. 230-231, 241.
- <sup>33</sup>Chapelle, Sailing Ships, pp. 260, 268-269; Hirthe and Hirthe, Schooner Days, p. vii.
- <sup>34</sup>Ibid., pp. 260-263.
- <sup>35</sup>Cuthbertson, Freshwater, p. 234.

- <sup>36</sup> Ibid., pp. 234-235.
- <sup>37</sup> H.C. Inches, The Great Lakes Wooden Shipbuilding Era (Cleveland: Cleveland Offset Corp., 1962), pp. 2-5.
- <sup>38</sup> Chappelle, American Sailing Ships, p. 268.
- <sup>39</sup> Mansfield, Great Lakes, I:547, 555.
- <sup>40</sup> Frank Andrews, Grain Movement in the Great Lakes Region, U.S.D.A. Bureau of Statistics, Bulletin 81 (Washington: Government Printing Office, 1910), p. 7; Odle, Grain Trade, p. 1.
- <sup>41</sup> Ibid., Grain Trade, pp. 6-9.
- <sup>42</sup> Andrews, Grain Movement, p. 8; Mansfield Great Lakes, I:526-530; Odle, Grain Trade, pp. 43, 47.
- <sup>43</sup> Ibid., pp. 44-45, 47.
- <sup>44</sup> Ibid., pp. 7, 37-39.
- <sup>45</sup> Ibid., pp. 39-41.
- <sup>46</sup> Toni Carrell, Submerged Cultural Resources Site Report: NOQUEBAY, Apostle Islands National Lakeshore, Southwest Cultural Resources Center Professional Papers, No. 7, (Washington, D.C.; U.S. Government Printing Office, 1986), pp. 14-18; Louis Falge, History of Manitowoc County, Wisconsin (Chicago: Goodspeed Historical Association, 1912), p. 137; Odle, Grain Trade, p. 41.
- <sup>47</sup> Ibid., pp. 77-78.
- <sup>48</sup> Mansfield, Great Lakes, I:530; Odle, Grain Trade, pp. 84, 89-94.
- <sup>49</sup> Ibid., pp. 85, 96.
- <sup>50</sup> Mansfield, Great Lakes, I:514, 518, 520.
- <sup>51</sup> William Rector, Log Transportation in the Lake States Lumber Industry 1840-1918 (Glendale, CA.: Arthur H. Clark Co., 1953), pp. 15, 20-23, 25.
- <sup>52</sup> Ibid., p. 25.

<sup>53</sup> Ibid., p. 38.

<sup>54</sup> Ibid., pp. 43-45, 48-49.

<sup>55</sup> Ibid., pp. 57-60.

<sup>56</sup> Ibid., pp. 176-189, 193.

<sup>57</sup> Mansfield, Great Lakes, I:519; Rector, Log Transportation, pp. 193-226.

<sup>58</sup> Odle, Grain Trade, p. 142.

## CHAPTER III

### VESSEL HISTORY

The schooner FLEETWING was the archetype for the class of sailing merchant vessels in use on the Great Lakes following the Civil War. She sailed with a small crew, carrying the cargoes she could find while competing with the larger, faster propellers as well as the railroads. Her passage excited little comment; the FLEETWING, after the initial attention due to her building and launch, disappeared into the shipping lists and casual references of the newspaper marine intelligence columns. Greater attention was focused on the fast propellers, ritzy passenger steamers, and large sailing barks than on the mundane activities of the ubiquitous lake schooners. Only her destruction brought her back from anonymity.

The FLEETWING was constructed in the short economic boom following the American Civil War. The year of 1866 brought record freights for grain on the Chicago to Buffalo run, beginning at twelve cents and advancing to

twenty-three cents. Other freights rose as well. Wrote Mansfield in his two volume History of the Great Lakes,

As a consequence there was a good demand for all classes of floating craft, which amounted to a craze. Many mortgaged their homesteads to secure a timberhead of anything afloat. Owing to the high freights . . . vessel masters were enjoined to make all possible dispatch in getting around with their respective craft, and these orders were carried out with uniformity never previously recorded.<sup>(1)</sup>

Shipping became a popular investment, especially with the merchant class. There were clear benefits to a store owner who shipped in his own goods at his own pier. Also, there was money to be made in hauling grain to Buffalo, and a "grain clipper" era was born, rivaling the China tea clippers if not in technology, than in enthusiasm of owners and crews.

The businessmen of Manitowoc, Wisconsin could not help but share in the frenzy. Known as the "Clipper City", Manitowoc had been a premier shipbuilding port since the 1850's, specializing in fast and staunch vessels for grain, lumber, and general merchandise.<sup>2</sup> Manitowoc's own lake commerce was not particularly large, but some lumber, shingles, farm produce, and grain was loaded at her piers onto vessels bound for the large lake cities like Chicago, Milwaukee, and Buffalo.<sup>3</sup>

Manitowoc's river, harbor, and a ready supply of lumber made it a good area for vessel construction.<sup>4</sup> The first ship built there was the sixty-ton schooner Citizen, built in 1847. In 1852, the yard of Stephan Bates turned out the schooner Challenge, the first clipper hull built on the lakes (Chapter II). Bates sold his business after the Civil War to Greenleaf S. Rand, who in turn hired a young shipbuilder, Henry B. Burger.<sup>5</sup> These men were prime contributors to the fine reputation Manitowoc held in shipbuilding, and the Rand and Burger shipyard turned out many a staunch vessel, both sail and steam. Amongst these vessels was the schooner FLEETWING.

Burger was twenty-seven when he built the FLEETWING, having learned his trade in the Wolff shipyards in Milwaukee. Born in Germany on December 21, 1839, he emigrated with his parents to the United States at the age of seven. They resided in Jeffersonville, New York for ten years before moving on to Milwaukee.<sup>6</sup> Burger's skill in shipbuilding was such that he went into business on his own following Rand's death in 1885. He entered into a partnership with his nephew George B. Burger to form the Burger and Burger shipyard. This property was sold to the Manitowoc Dry Dock Company in 1902. As the Manitowoc Shipbuilding Company (1937), this firm was a



leading manufacturer of submarines during World War Two. The Burgers moved across the river, continuing as the Burger Boat Company. This firm continues to the present as a manufacturer of large yachts.<sup>7</sup>

The Manitowoc newspapers kept a reasonably close tab on shipping news, and the contracting and construction of the FLEETWING was duly noted by the marine intelligence reporters of the Pilot and Tribune. This is the best information available on her construction in lieu of a loft book, set of naval architectural plans, or a half hull, none of which are known to exist for the FLEETWING. Unfortunately, a fire at Burger Boat Company in 1911 destroyed many of the company's early records. Either her plans were lost, or she was built by eye with experienced loftsmen, as was the tradition of the time with many wooden vessels.

Doubtlessly influenced by the shipping demands two Manitowoc businessmen, Peter Johnston and Sylvester Goodenow, contracted Henry Burger early in 1867 to build a sailing vessel for the grain trade, with the appropriate speed and cargo capacity. The Manitowoc Pilot reported on February 15, 1867 that the timber was contracted for, and the keel would soon be laid for a

vessel of the following dimensions; 130-foot keel, 28-foot beam, and 11-foot depth of hold.<sup>8</sup>

On April 19, Goodenow and Johnston's new vessel was in frame, with the following dimensions; 132-foot keel, 28-foot beam, and 11-foot 6 inches depth of hold. Her launching date was estimated to be mid-July, and Burger had twenty-three men employed on her at a cost of \$300 per week. The Pilot reported her cost when finished to be \$30,000, and her cargo capacity to be for 18,000 bushels of grain.<sup>9</sup>

The quality of work apparent on this vessel gained reknown for Burger, and helped in establishing his business. The Pilot reported on August 2,

Mr. Henry B. Burger, who is now building the new schooner for Goodenow and Johns[t]on, has purchased a number of lots in the vicinity of Jones' saw mill, in the big bend of the river, and will establish a permanent shipyard, and take orders for the building of all kinds of crafts. Judging from the vessel he has now on the stocks, and which is nearly ready to be launched, he will turn out as good work as can be done anywhere on the lakes. We hope he will receive sufficient encouragement to build up a flourishing business.(10)

On August 9 it was announced that the new vessel was to be launched the following afternoon.<sup>11</sup> Saturday, August 10 was sunny with a cool lake breeze, and hundreds turned out in the pleasant weather to see the launching. Both the Pilot and the Tribune reported Burger's work

with the highest praise, save for a delay in freeing the vessel from the ways. Noted the Tribune,

By four o'clock the crowd was on hand, but the vessel was not. Either a miscalculation or an insufficient number of men caused a very unpleasant delay of nearly two hours. During this delay various expedients were adopted to kill time. The writer hereof blistered his hands sculling the new vessel's yawl - a very nice one by the way - up and down the river with a party of ladies who desired to have a good view of the launch.<sup>12</sup>

The town boys naturally took the delay and the assembled crowd as an opportunity to show off, and a water fight erupted between two contending parties. Another boy fooling about on a log pile fell into the river, and emerged looking like a drowned rat, to the crowd's amusement. Finally, after six o'clock the blocking was removed from the ways, and the order, "all right, cut!" was given. With two axe chops the vessel slid and struck the water, righting herself to the plaudits of the spectators. The name FLEETWING flew on her jackstaff.<sup>13</sup>

The beauty of the vessel and her solid construction were rather remarked upon. The Pilot wrote, "[s]he sets very handsome in the water, has a clear run, and reflects great credit upon her constructor, Mr. Henry Burger, and the force of men in his employ. Success to the FLEETWING."<sup>14</sup> The Tribune reporter added;

there is no stronger vessel than this. Nothing that would add to its strength has been omitted, and it is fully expected she will rank as A No. 1, for seven years. She is certainly a massive craft, yet from what is said of her and from our knowledge of lake vessels we would infer there is no spare timber used. Her sailing qualities will soon be known, therefore we withhold our judgement as to her merit in that line. If she keeps up the good name our vessels have already attained she will have to make fast time. We hope she will do it and add greatly to the wealth of her owners.(15)

Designed principally for the grain trade between Chicago and Buffalo, she had a capacity for 18,000 bushels of wheat. Alternatively, she could carry 225,000 feet of lumber, and she had ports on each side of her hull for its loading and unloading. She was to be rigged as a schooner, with a foremast of 86 feet, a mainmast of 88 feet, and two topmasts, each of 60 feet. Her overall length was 145 feet.<sup>16</sup> Her first enrollment gives her dimensions as length (on keel) 136 feet, beam 28.5 feet, and depth of hold 11.6 feet, with a total tonnage of 349.78. She had two masts, an eagle figurehead, and a half round stern.<sup>17</sup> Her first master was Capt. L. Simpson, a lake captain of long experience and high reputation.<sup>18</sup>

Though not specifically mentioned in the newspapers, it is most probable that the FLEETWING was launched sideways, as was the practice in the confines of the

Manitowoc River (and also in other lake ports) including the sideways launching of submarines in World War Two.<sup>19</sup>

Following the launch, the riggers set to work on the FLEETWING. The Tribune reported on August 22 that the new schooner would be ready for business in about two weeks. The Pilot noted on September 6,

The new and fine looking schooner FLEETWING was brought below the bridge on Wednesday [September 4], fully rigged and equipped. On Thursday she was towed out into the lake, and departed for Kewaunee, where she will take her first load for Chicago. She will then go into the grain trade. A prettier or stancher vessel does not float.(20)

At Kewaunee, the FLEETWING picked up seven thousand railroad ties as her first cargo, and set sail for Chicago. There she obtained a cargo of 20,000 bushels of wheat and cleared for Buffalo, passing Manitowoc upbound on September 15.<sup>21</sup>

However, the shipping boom had begun to fade, as well as experience a saturation of carriers. While lake freights were not poor (six to fifteen cents on wheat), a large increase in tonnage did increase competition for existing cargoes. At the opening of navigation, fourteen propellers, sixteen barkentines, sixty-nine schooners, and nine tugs had been built in anticipation of great new profits.<sup>22</sup>

The FLEETWING's owners were businessmen, interested in the potential profits to be made in carrying grain to Buffalo from the Chicago elevators. Peter Johnston and Sylvester Goodenow each owned one-half of the ship.<sup>23</sup> Johnston was a prominent resident of the city as well as an early settler of the region. He, his wife, and his daughter were the only people to remain in Kewaunee after the town was deserted in the 1837 Panic. At that time, the population of Manitowoc County dropped from 180 to 60. Nearly starving over the winter, they were rescued by a group of Manitowoc men and were brought to that town in a Mackinaw boat (a small open fishing boat), where Johnston opened a saloon in the National Hotel.<sup>24</sup>

As Manitowoc grew and prospered, so did Johnston. Manitowoc County was organized in 1839 under the territorial government. In the elections for a county board, Johnston served as a clerk, and was elected County Collector, this in an election where thirty-five votes were cast for six officers.<sup>25</sup> Around 1857 Johnston leased the city's North Pier, and went into the shipping business, advertising,

General Forwarding and Commission business with promptness and despatch. WOOD, PORK, FLOUR, BEEF AND OATS, constantly on hand.(26)

He thereafter purchased the North Pier in 1861, advertising himself as an agent for the Merchant's Union Express Company (1868) or simply as a grain merchant (1880).<sup>27</sup>

In addition to the FLEETWING, Peter Johnston later held interests in other vessels; the schooners BELLE, THOMAS HOWLAND, THISTLE, C.L. JOHNSTON and perhaps up to four other ships. As well as being a prominent shipper and shipowner, Johnston continued to serve Manitowoc in a public capacity; as a county justice, as her first mayor (1870-1871), and as a state assemblyman (1877). He was also involved in numerous town social societies.<sup>28</sup>

Goodenow too was a merchant, advertising himself as a,

General dealer in dry goods, groceries, provisions, hardware, crockery, boots, shoes, hats and caps, wooden ware, etc., . . . the highest market price paid for country produce.(29)

In addition to general merchandising, Goodenow served on the County Board of Supervisors for the Second City Ward in 1861. Sometime between 1868 and 1869 he moved to Evanston, Illinois, still retaining his share of ownership in the FLEETWING.<sup>30</sup>

The FLEETWING's first season was rather short. After one or perhaps two runs to Buffalo she returned to

Manitowoc for the winter layup, probably with a return cargo of coal or manufactured goods, if anything. She was reported to be back in the river on December 12, one of the first three (of seventeen) schooners to lay up at Manitowoc that winter.<sup>31</sup> Johnston and Goodenow appeared to be taking no chances with their new vessel. Marine insurance coverage usually expired on noon of November 1, after which vessels were either uninsurable against winter storms, or were underwritten at much higher rates.<sup>32</sup>

Those latecomers who risked winter cold by accident or design were treated with the best the Great Lakes could offer. A late arriving fleet in Chicago was reported by an observer,

As each craft came in, she had the appearance of a moving iceberg. Covered with frozen spray, the sails stiff as boards, tiller wheel and gearing almost unmovable, the decks forming miniature skating parks and fire in the cabin nearly extinguished; it is a subject of wonder that they ever reached the city at all. The seamen were many of them severely frostbitten, and a number will lose their fingers and toes and suffer terribly in their faces and other portions of their bodies. They are thankful, however, that they escaped with their lives.(33)

Preparations for the opening of navigation began to be made in March, 1868 including fresh coats of paint for the iced-in Manitowoc vessels. The FLEETWING cleared



Manitowoc on March 23 with 160 cords of wood and 6,000 posts for Chicago.<sup>34</sup>

While it would be prohibitively time-consuming to trace the FLEETWING's every action for her twenty-one year history, some general information about her can be learned from her enrollments, clearances and arrivals, changes of ownership, and data about the trade she was engaged in. The marine shipping lists can be difficult to follow, due to the volume of shipping (some of which was missed or misreported by marine reporters) as well as the existence of other schooners named FLEETWING.

One, a smaller vessel of 169 tons was built in Wilson, New York at the D. McNett yard in 1863. She appears to have been engaged in a lower lake trade route. Another even smaller FLEETWING was built at Charlevoix, Michigan in 1877. She measured 38 net tons, with a length of 68 feet, beam of 16 feet, and depth of 5.6 feet. She was sold to a party in Mobile, Alabama in 1900.<sup>35</sup> Fortunately, both these vessels were much smaller, and engaged in general merchandise trade. Thus, there is only one known grain schooner FLEETWING operating out of Chicago.

The opening of the Chicago - Buffalo grain trade was a spectacular event. Prior to the use of telegraphs for vessel owners and agents to communicate with ship's masters, the exact date of the opening of the Straits of Mackinaw for navigation was largely a matter of guesswork. The grain fleet would wait, laden, for a sign that the Straits were free of ice. An old lake captain, Timothy Kelley, recalls,

. . . when some one of the fleet thought the weather ought to have made the passage possible, away he would go out of Chicago for Buffalo and like a flock of pigeons the rest would be right after him. The rivalry between the ships as to speed was intense. No one would permit another an advantage he could prevent. The rivalry extended to the crews. There were many then famous, but now forgotten sailing ship races from Chicago to Buffalo.(36)

Sometimes the furtiveness and surreptitious departure came to naught as a drop of the mercury and an unsympathetic wind working the ice packs would trap the entire grain fleet in the Straits.<sup>37</sup> In any case, the first cargo of grain into Buffalo fetched a high price, and gave the economic incentive to this "grain clipper" mania. In September of 1867, the bark Chicago Board of Trade (on which Timothy Kelley had sailed as a ship's boy) made the Chicago to Buffalo run in a noteworthy

twelve days and fourteen hours.<sup>38</sup> It is not known how the FLEETWING fared in these races for Buffalo.

TABLE 5  
Opening of the Straits of Mackinaw

<u>Year</u>	<u>Opened</u>
1860	April 12
1861	" 24
1862	" 17
1863	" 16
1864	" 22
1865	" 20
1866	" 28
1867	" 21
1868	" 20
1869	" 23

Source: William Thurstone, Statement of the Trade and Commerce of Buffalo for the Year Ending December 31, 1869 (Buffalo: Warren, Johnson, & Co., 1870) p. 38.

After clearing the Straits, the grain schooners required a tug to tow them through the St. Clair and Detroit Rivers, and out to Lake Erie, a distance of some eighty miles. Tows of as many as eight schooners were not uncommon, and competition amongst the tugs was keen. Some would venture out on Lake Huron and as far as the Straits looking for tows.<sup>39</sup>

Even in those days, sailing ships held a certain glamor, and Kelley remembers the old grain fleet,

We boys of the Chicago grain fleet of sailing vessels knew each schooner in that fleet as far as

we could see her. Each was an individual with her own peculiarities of appearance and manner of behaving.(40)

The crews of these vessels were a different breed, distinct from salt-water sailors. They were accustomed to shorter, coasting voyages and somewhat better food (due to more frequent reprovisioning). The seasonal aspect of lake shipping dictated that sailors have a winter profession, and many worked as shipbuilders, farmers, and even timberjacks.<sup>41</sup> However, these men (and women) endured bitter cold, primitive navigational aids, and unimproved harbors. Prior to the development of unloading equipment, bulk cargoes had to be unloaded by hand, and even in later days, primitive equipment required the sailors to turn to with shovels.<sup>42</sup>

Many of the larger sailing vessels carried salt-water men in their crews, some of whom returned to the ocean for the winter season. They formed the cadre of experienced sailors, and trained the ship's boys, "not at all uncommonly with the aid of the traditional rope's end."<sup>43</sup> Captain Kelley recalls the Norwegian sailors, and enjoyed standing watches with them, listening to their tales of the South and China Seas. Eager young lake sailors learned the names of New York - Liverpool clipper masters, and heard strange tales about flying

fish. Many salt water men, who had lived their lives in the fo'c'sles of ocean ships, were unfamiliar with the more democratic aftercabins of lake schooners where all hands took their meals. Never having used tables or silverware, some ate their meals with nothing but a sheath knife.<sup>44</sup>

However, lake conditions were not luxurious. A hard night watch might be followed with bread and "salt horse", a poor enough fare, and if there was not enough (there never was, according to Kelley) the younger boys ended up short.<sup>45</sup> A sailor also had to beware of the ship itself, as the Manitowoc Tribune reports:

Arm Broken - As the schooner FLEETWING was being towed down Chicago River Tuesday evening, Duncan Campbell, the mate received a blow on the right arm from some portion of the ship's tackle fracturing that limb.(46)

The congested shipping in the Chicago River frequently kept off the dull times for crewmen, as the Chicago Daily Inter-Ocean indicates:

Exciting Times in the Harbor Yesterday -  
Fire Alarm and Bridge Closed in a  
Schooner's Face.

Result, a Smashup - Activity of Firemen with  
Axes - A Four-Handed Collision, Three  
Tugs and a Schooner.

Serious Collision Outside - Damage to the  
Large Schooner Thos. P. Sheldon - She  
Is Brought In.

Negotiating the bridges was made difficult by cross traffic, and a fire alarm (in this case) might close the bridge in the face of an approaching vessel. A malfunctioning engine room bell on a tug added further to the excitement, and the out of control tug began colliding, creating a domino effect amongst the crowded shipping.<sup>47</sup>

As if the difficulties of sailing were not enough, unions had begun to place new demands on sailors. While unions doubtlessly improved some working conditions, union violence was not unknown in the dockyards. Non-union dock laborers engaged in loading the schooner ST. LAWRENEE attracted a flying squad of Seaman's Union ruffians who boarded the vessel armed with clubs, driving the laborers ashore. The vessel's mate "stood his ground, and very effectively made use of a heavy spike", but was overpowered and severely beaten by the unionists.<sup>48</sup> When the schooner F.L. DANFORTH shipped a non-union crew, four policemen were required to quell the ensuing trouble.<sup>49</sup>

The large grain schooners carried a crew consisting of a captain, two mates, a steward (cook), and six to

eight seamen. In her later years, the FLEETWING's crew may have been reduced to as few as six or less, including the officers and cook. Smaller schooners might be manned by only a crew of two. In 1867, sailor's wages were \$2.25 per day; Chicago sailors were getting about twenty-five cents less than this, and Milwaukee sailors about twenty-five cents more.<sup>50</sup>

The FLEETWING took on a new master in 1869, J. Harlder, Captain Simpson moving to the SARDINIA. She also changed her port of registry from Milwaukee to Chicago. She cleared Milwaukee for Buffalo on October 17 with 20,000 bushels of wheat, at which time her jib-boom was broken by a minor collision in the Milwaukee River. She returned November 7-8 with 600 tons of Buffalo coal. The end of 1869 found her in winter quarters at Buffalo Creek, evidently bringing in her last grain cargo of the season and laying up.<sup>51</sup> This made more economic sense then returning empty to Manitowoc or Chicago late in the season and was probably the pattern she followed every fall during her service with the grain fleet, if a good return cargo was unavailable.

Captain J.B. Chandler took the FLEETWING's helm in 1872 or perhaps earlier, and was succeeded by M.D. Howard on July 24, 1873. On February 12, 1874 a Chicago lake

captain, James Pederson, entered into partial ownership with Johnston and Goodenow, each assuming one-third ownership of the schooner. Pederson was her new master.<sup>52</sup> The FLEETWING was valued at \$17,000, and given an insurance class rating of A2.<sup>53</sup> As foretold by the Tribune reporter at her launch, she kept her A1 rating for seven years.

The shipping news indicates the FLEETWING was still involved in the grain trade at this time, being chartered to take 19,965 bushels of corn to Buffalo on July 3, 1874 at four cents per bushel. Clearing Chicago on the fourth, she passed Detroit on July 10 downbound in company with thirty-four other schooners and two propellers. Eight days later she passed Detroit and Port Huron upbound, empty or with an unknown cargo (coal and manufactured goods were common return cargoes). She returned to Chicago on August 12 with a load of wood from Sturgeon Bay that had been obtained enroute. Unfortunately, the lumber market was exceptionally poor at this time, and vessels had a difficult time selling their cargoes.<sup>54</sup> After selling the lumber, she either cleared empty for another run, or was laid up due to low freights. This pattern of mixed cargoes probably



continued for a number of years, as the propellers and railroads increasingly dominated the grain trade.

The following year, the FLEETWING was valued at only \$16,000, still A2, but had her old deck replaced. By 1879 her value had dropped to \$8,500, B1. In 1880, the FLEETWING again changed hands. James Pederson continued as master and one-third owner, but Goodenow and Johnston sold out. Three Chicago lumbermen bought the remaining shares; H.H. Gardner owned one-sixth, John C. Spry two-sixths, and John Spry, bought one-sixth and acted as managing owner.<sup>55</sup>

Spry was a Cornish immigrant who had been employed in the Chicago lumberyards as a boy, and later worked his way into the business. In 1866 the firm of Gardner and Spry was organized, with H.H. Gardner as the senior partner. This became the Gardner and Spry Lumber Company in 1869. Gardner retired in 1885, and the firm became the John Spry Lumber Company. Spry was president; his sons John C., S.A., and George were associates of the firm.<sup>56</sup>

Spry's company was a massive affair, with 3,000 feet of dock frontage handling seventy-five to eighty million feet of lumber annually. Spry had owned at least one other schooner, the ELLEN SPRY (which he sold to his

partner Gardner in 1883), and later acquired a fleet of barges. He also had steamer named after him, operated by a former business partner, F. B. Gardner. Spry's specialty was high grade wholesale pine; his piling capacity of forty million feet was said to be the largest stock of dry lumber in the city of Chicago.<sup>57</sup> The FLEETWING'S job was to help keep this yard supplied.

In September, 1880, six months after her purchase by Gardner and Spry, the FLEETWING was readmeasured (remeasured) by the Chicago Port Surveyor, and again changed enrollment. The new measurement reduced her total tonnage to 320.12. On October 8 she cleared Chicago for Buffalo, probably with grain.<sup>58</sup>

Her final change of owners came the following spring. Perhaps her hauling had not worked out to the advantage of Capt. Pederson and the others. Only John Spry stayed in, increasing his share to one-third ownership. The rest was bought by Andrew L. McGraw, a Chicago shipowner. Edward Finn was the new master. A Federal act of August 5, 1882 allowed for further tonnage deductions to be made from a ship's crew and machinery spaces. The FLEETWING deducted sixteen tons (probably for her deckhouse and perhaps a fo'c'sle) giving her a net tonnage of 304.12. Either through a rebuilding or a

remeasurement at the time of her 1881 enrollment, her dimensions had changed slightly; length 135.3 feet, breadth 28.4 feet, and depth 11.5 feet.<sup>59</sup>

Working for Spry ended the FLEETWING's glory days, racing for the Straits with a cargo of eastbound grain; although the newspaper listed her as a grain carrier, this did not seem to be part of her new duties. From this period, the shipping lists show her as shuttling between Chicago and Michigan's Lower Peninsula mills on Lake Huron. She did however carry at least one last, but ill-fated, grain cargo. In a dense mid-May fog the FLEETWING collided with the lumber schooner ADVANCE seven miles off Point Sauble, Michigan. The ADVANCE's crew and the FLEETWING's mate went ashore at Manistee to report the damage. The ADVANCE's bow had been knocked out, and she had immediately become waterlogged. Her port bow was completely crushed, the deck was raised, and the bulwarks and jib-boom were gone. The FLEETWING was towed back to Milwaukee for repairs by the tug CAROLINE WILLIAMS, having lost her bowsprit, jib-boom, and headgear. The ADVANCE was towed into Frankfort, Michigan. The FLEETWING was libelled for the damages by Capt. Paulson of the ADVANCE.<sup>60</sup>

It seems doubtful that the FLEETWING ever made it to Buffalo with the grain. On June 16, 1881, she arrived from Saginaw, Michigan with a load of lumber (whence she was noted as a grain carrier). She cleared light (empty) on June 18 for Cheboygan, Michigan, reaching the town on 22 June. After loading another lumber cargo, she returned to Chicago on June 28. She cleared light the following day, again for the Cheboygan mills.<sup>61</sup>

The light departures suggest a regular run to the outlying mills; upbound cargoes were not taken, either due to the time wasted in locating one, or their unavailability. Apparently, the schooner was to be employed largely for lumber transport, with a fast turn-around between cargoes. 1882 found the FLEETWING similarly engaged, though she somehow obtained a cargo of cut stone from Belleville in June. November 20 found her arriving in Chicago with a load of Muskegon lumber.<sup>62</sup>

While business appeared to be brisk, profits did not seem to be greatly forthcoming. In January 1884, McGraw mortgaged the entire vessel, including her rig, anchors, boats, etc., to James McGraw for the sum of four-thousand dollars, at 7-percent interest for one year. At the time she was valued at \$5,000, B2. McGraw remortgaged the entire vessel in January 1885 for two years, also to

James McGraw, this time for 4,280 dollars. In this year she was only valued at \$4,000, B2. She was rebuilt in 1885 (to what degree is not known) and was recaulked both in 1886, and in 1887. The vessel was released from the mortgage in March, 1888. The terms of the mortgage required that the vessel be insured, and if the vessel were willfully or negligently damaged or destroyed, the mortgager was given the right to take possession of the vessel, and collect his unpaid principal from sale of the ship.<sup>63</sup> This last clause may have had some bearing on the manner in which the schooner was eventually lost.

In her final years of service, the FLEETWING also made runs to Menominee, located in Michigan's Upper Peninsula. There was located the sawmill of Ludington, Wells, and Van Schaick Lumber. The company, formed in 1866, had vast holdings in timberlands, as well as a yard in Chicago. This firm supplied at least part of Spry's lumber. The owners were prominent businessmen and state leaders in Wisconsin, Illinois, and Michigan.<sup>64</sup>

Harrison Ludington served Wisconsin as governor in 1876, having previously been mayor of Milwaukee. Anthony Van Schaick ran the Chicago end of the operation, and held the offices of secretary, treasurer, and vice-president in the company, as well as

vice-presidencies and directorships in various shipping, lumbering, and banking firms.<sup>65</sup> Daniel Wells, Jr., the original owner of the Menominee mill, was also a former public officeholder, and held interests and positions in banking, insurance, real estate, and lumber. Upon his death in 1902, his interests were valued at between fifteen and twenty-five million dollars.<sup>66</sup>

The following is an indication of the FLEETWING's activity in the summer of 1887.

TABLE 6

<u>Cleared Chicago For</u>	<u>Returned From</u>	<u>Cargo</u>
6/17/87 - Menominee	6/15/87 - Cheboygan	Lumber Light
6/25/87 - "	6/24/87 - Menominee	Lumber Light
7/06/87 - "	7/04/87 - "	Lumber Light
7/14/87 - "	7/13/87 - "	Lumber Light

Source: Chicago Daily Inter-Ocean June 15 - July 14, 1887.

These trips average seven and one-third days. On a round trip of over 540 miles, this was a reasonably good speed, considering loading time at Menominee, tacking, and several course changes. A very fast passage on this route had been logged by the schooner CUBA; twenty-four hours from Chicago to Death's Door Passage, about 234

miles of the 270 mile Chicago - Menominee run.<sup>67</sup> This, however, was exceptional sailing.

On one of these runs, the FLEETWING was party to another collision, her second under Capt. Finn, and was again libelled. The FLEETWING had somehow gone aground on the north end of the Sturgeon Bay Ship Canal, and was flying a distress flag, but also had all sails set. The schooner SURPRISE was headed out of the canal with a load of lumber for Milwaukee in tow of the tug PIPER. Capt. Jacobs of the PIPER did not realize that the FLEETWING was stranded (due to the set sails) and the SURPRISE collided, losing her dolphin-striker, and some of her head-gear. It was SURPRISE's second collision at Sturgeon Bay in two days, having previously been rammed amidships by a runaway tugboat. The SURPRISE's captain, doubtlessly in ill-humour, was towed back by the PIPER to Sturgeon Bay and recommenced to repair his ship.<sup>68</sup>

It was a bad omen of things to come for the FLEETWING on the Menominee route.

## FOOTNOTES

<sup>1</sup>J.B. Mansfield, History of the Great Lakes, 2 vols. (Chicago: J.H. Beers & Co., 1899), I:704.

<sup>2</sup>Louis Falge, History of Manitowoc County, Wisconsin, 2 vols. (Chicago: Goodspeed Historical Association, 1912), 1:128; Manitowoc Tribune, 4 May, 1871.

<sup>3</sup>Ibid., p. 133.

<sup>4</sup>W.T. Nelson, Freshwater Submarines: The Manitowoc Story (Manitowoc: Hoeffner Printing, 1986), pp. 1-2.

<sup>5</sup>Manitowoc Tribune, 4 May, 1871.

<sup>6</sup>Falge, History of Manitowoc County, 2:5.

<sup>7</sup>Nelson, Freshwater Submarines, pp. 3-8.

<sup>8</sup>Manitowoc Pilot, 15 February, 1867.

<sup>9</sup>Ibid., 19 April, 1867.

<sup>10</sup>Ibid., 2 August, 1867.

<sup>11</sup>Ibid., 9 August, 1867.

<sup>12</sup>Manitowoc Tribune, 15 August, 1867.

<sup>13</sup>Ibid.; Manitowoc Pilot, 16 August, 1867.

<sup>14</sup>Manitowoc Pilot, 16 August, 1867.

<sup>15</sup>Manitowoc Tribune, 15 August, 1867.

<sup>16</sup>Ibid.; Manitowoc Pilot, 16 August, 1867.

<sup>17</sup>Enrollment 22, Port of Milwaukee, September 3, 1867, Record Group 41, National Archives, Washington, D.C.

<sup>18</sup>Manitowoc Tribune, 15 August, 1867; Manitowoc Pilot, 16 August, 1867.



<sup>19</sup>H.C. Inches, The Great Lakes Wooden Shipbuilding Era (Cleveland: Cleveland Offset Corporation, 1962), p. 4.

<sup>20</sup>Manitowoc Tribune, 22 August, 1867; Manitowoc Pilot, 6 September, 1867.

<sup>21</sup>Manitowoc Tribune, 12 September, 1867; Ibid., 19 September, 1867.

<sup>22</sup>Mansfield, History of the Great Lakes, I:706.

<sup>23</sup>Enrollment 22, September 3, 1867.

<sup>24</sup>Otto Gass, History of the City of Manitowoc (Appleton: Post Publishing Co., n.d.), pp. 18-25.

<sup>25</sup>Falge, History of Manitowoc County, 1:58-63.

<sup>26</sup>Manitowoc Tribune, 20 November, 1857.

<sup>27</sup>Ralph G. Plumb, A History of Manitowoc County (Manitowoc: Brandt Printing and Binding Co., 1904), p. 60; Manitowoc City Directory (Manitowoc: Richard Edwards and Co., 1868), p. 41; Manitowoc City Directory (Manitowoc: Bold and Smithing, 1880), p. 74.

<sup>28</sup>"City of Manitowoc Celebrates Centennial," Manitowoc County Historical Society Newsletter 4/2 (March 1970):3; Classification - National Board of Lake Underwriters (Buffalo: Matthew & Warren, 1874); Kenwood S. Egan, ed., Manitowoc Homecoming and Golden Jubilee 1870-1920 (Manitowoc: Manitowoc Pilot, 1920), p. 6; "John Nagle's History of Manitowoc County, 1878," Manitowoc County Historical Society Occupational Monograph 2/22 (1974 series), p. 19; Manitowoc Tribune, 12 August, 1869; Plumb, A History of Manitowoc County, pp. 173, 270.

<sup>29</sup>Manitowoc Tribune, 20 November, 1857.

<sup>30</sup>Falge, History of Manitowoc County, 1:84; Mantowoc City Directory 1868, p. 37; Manitowoc Tribune, 11 February, 1869.

<sup>31</sup>Manitowoc Pilot, 13 December, 1867; Manitowoc Tribune, 12 December, 1867; Ibid., 19 December, 1867.

<sup>32</sup>William Thurstone, Statement of the Trade and Commerce of Buffalo for the Year Ending December 31, 1869 (Buffalo: Warren, Johnson, and Co., 1870), p. 23.

<sup>33</sup>Manitowoc Tribune, 19 December, 1867.

<sup>34</sup>Ibid., 5 March, 1868; Ibid., March 26, 1868.

<sup>35</sup>Classification, p. 349; Enrollment 7, Port of Mobile, Alabama, 38 August, 1900, Record Group 41, National Archives, Washington, D.C.

<sup>36</sup>Falge, History of Manitowoc County, 1:137.

<sup>37</sup>Ibid., 1:137.

<sup>38</sup>Manitowoc Tribune, 26 September, 1867.

<sup>39</sup>Falge, History of Manitowoc County, 1:137.

<sup>40</sup>Ibid., 1:136.

<sup>41</sup>"Norwegian Shipbuilding in Early Milwaukee," Milwaukee History, 1 (3-4) 1978:82.

<sup>42</sup>Falge, History of Manitowoc County, 1:138, Arthur and Lucy Frederickson, Ships and Shipwrecks in Door County, Wisconsin, 2 vols. (Sturgeon Bay, Wisconsin: Door County Publishing Co., 1961-3), 1:68.

<sup>43</sup>Falge, History of Manitowoc County, 1:136.

<sup>44</sup>Ibid.

<sup>45</sup>Ibid.

<sup>46</sup>Manitowoc Tribune, 11 June, 1868.

<sup>47</sup>Daily Inter-Ocean, 17 June, 1881.

<sup>48</sup>Ibid., 2 July, 1887.

<sup>49</sup>Ibid., 15 June, 1881.

<sup>50</sup>Door County Advocate, vol. 6/20, 1867; Falge, History of Manitowoc County, 1:137-138.

<sup>51</sup>Enrollment 47, Port of Chicago, 9 September, 1869; Manitowoc Tribune, 12 August, 1869; Milwaukee Sentinel, 18 October, 1869; Ibid., 9 November, 1869; Thurstone, Commerce of Buffalo, p. 27.

<sup>52</sup>Endorsement of Change of Master, Port of Chicago, July 24, 1873, Record Group 41, National Archives Branch, Chicago; Enrollment 90, Port of Chicago, 5 December, 1872; Enrollment 115, Port of Chicago, 12 February, 1874.

<sup>53</sup>Vessel hulls were rated for insurance purposes based on age and current maintainance. The classes were; A1, A1-, A2, A2-, B1, B1-, B2, and C1. Published insurance rates for the 1868 season were; A1-\$6.00, A2-\$6.50, B1-\$7.50, B2-\$9.00, with 50% added beyond 30 September for sailing vessels, and 75% on steamships. Vessels were insured only up to four-fifths of their actual value. Classification p. 1; Manitowoc Tribune, 12 March, 1868.

<sup>54</sup>Chicago Tribune, July 3, 1874; Ibid., July 4, 1874; Ibid., July 10, 1874; Ibid., July 18, 1874; Ibid., August 13, 1874.

<sup>55</sup>Classification - National Board of Lake Underwriters (Buffalo: Matthew & Warren, 1875), p. 43; Enrollment 97, Port of Chicago, 11 March, 1880, Record Group 41, National Archives Branch, Chicago; Lake Hull Register, Association of Lake Underwriters (Detroit: Free Press Book and Job Printing House, 1879), p. 44; Vessel Classification of the Inland Lloyds; American Hulls (Buffalo: Printing House of Matthews, Northrup, and Co., 1882), p. 33.

<sup>56</sup>George W. Hotchkiss, Industrial Chicago, Vol. 5: The Lumber Interests (Chicago: Goodspeed Publishing Co., 1894), p. 467.

<sup>57</sup>Walter and Mary Hirthe, Schooner Days in Door County (Minneapolis: Voyageur Press, 1986), pp. 17, 28, 134, 136; Hotchkiss' Lumberman's Directory of Chicago and the Northwest (Chicago: R.R. Donnelley and Sons, 1886), p. 49; Hotchkiss, Lumber Interests, p. 467.

<sup>58</sup>Chicago Tribune, 8 October, 1880; Enrollment 33, Port of Chicago, September 4, 1880.

<sup>59</sup> Enrollment 144, Port of Chicago, 7 May, 1881; Hirthe and Hirthe, Schooner Days, p. xi.

<sup>60</sup> Door County Advocate, 19 May, 1881; Ibid, 26 May, 1881.

<sup>61</sup> Chicago Daily Inter-Ocean, 16 June, 1881; Ibid., 20 June, 1881; Ibid., 23 June, 1881; Ibid., 28 June, 1881; 29 June, 1881.

<sup>62</sup> Ibid., 23 June, 1882; Ibid., 20 November, 1882.

<sup>63</sup> Index of Conveyances of Vessels, Port of Chicago, Record Group 41, National Archives Branch, Chicago; The Inland Lloyds Vessel Register (Buffalo: Printing House of James D. Warren's Sons, 1887), June supplement No. 3; Mortgage 48, Registered or Enrolled Vessels, January 8, 1884, Port of Chicago, Record Group 41, National Archives Regional Branch Center, Chicago; Mortgage 88, Registered or Enrolled Vessels, January 6, 1885, Port of Chicago, National Archives Regional Branch Center, Chicago; Vessel Classification of the Inland Lloyds: American Hulls (Buffalo: Printing House of Matthews, Northrup, and Co., 1884), p. 35; Vessel Classification of the Inland Lloyds: American Hulls (Buffalo: Printing House of Matthews, Northrup, and Co., 1885), p. 33.

<sup>64</sup> Hotchkiss, Lumber Interests, pp. 340-345, 398-399.

<sup>65</sup> Ibid.

<sup>66</sup> Field notes for biographical sketch of Daniel Wells, Jr., United States W.P.A. Wisconsin biography, State Historical Society of Wisconsin Archives, Madison, Field Continuity # 1, p. 3; Milwaukee Free Press 19 March, 1902.

<sup>67</sup> Door County Advocate, 30 April, 1868.

<sup>68</sup> Ibid., 1 October, 1887.

## CHAPTER IV

### THE WRECK

The difficulties of getting through the Death's Door Passage were legend to lakemen. Stories about this spot had been passed down from the local Indians to the French, who called it Porte des Morts. Despite lights and buoys, the narrow rocky strait continued to claim numerous sailing vessels every year, due to scattered shoals, islands, shifting winds and contrary currents. Some of these vessels were pulled off with safe but shaken crews. Many were not. A lightkeeper's diary indicates that approximately two wrecks a week took place there between 1872 and 1899. In one black week in 1872, almost one hundred vessels were damaged or lost in the "Door".<sup>1</sup>

Local shipping and merchant interests clamored for public money to overcome nature's shipkiller. The idea was forwarded that a short canal could be cut at Sturgeon Bay, fifty miles to the south, from the east edge of the bay out to Lake Michigan. This would allow ships to pass back and forth from Green Bay and Lake Michigan without negotiating the Door. Congressmen were told thrilling

tales of shipwreck and disaster by lobbyists, but despite their efforts the canal project in fact had to be launched with private funds. The Sturgeon Bay and Lake Michigan Ship Canal Company was chartered in 1867, selling its shares at fifty dollars each. Congress also appropriated 200,000 acres of land for the canal and new harbor. Digging commenced in 1872, and in the fall of 1881, the canal was declared complete. The completed canal was 7,200 feet long, 100 feet wide, and 14 feet deep. It was built at a cost of \$29,461.69. The national government later purchased the canal, taking possession in April, 1893.<sup>2</sup>

However, the new canal did not quite meet the builder's expectations, at least initially. The editor of the Door County Advocate noted,

Traffic through the canal continues light, captains of sail vessels having received orders from owners not to use the cut unless able to sail through or compelled to do so by stress of weather.(3)

Canal regulations forbade sailing vessels from beating up into the canal, and were required to wait for a tow if a fair wind was unavailable. Tugs worked on a sliding scale; a vessel of the FLEETWING's tonnage would have to pay sixteen dollars to be towed in either direction between Green Bay and Lake Michigan in 1881, and the

price may well have gone up by 1888. Additionally, canal tolls had to be paid to the tug masters to be collected by the canal superintendant (five cents per registered ton in 1881; this too may have gone up by 1888). This would have cost the FLEETWING \$15.20 in either direction, for a total cost of \$62.40 for the round trip to Menominee.<sup>4</sup>

Evidently, the uncertainties of the Door were preferable to the certainties of a canal tug towing bill and toll. Owners were willing to risk their vessels rather than reduce their already slim profit margin. The FLEETWING's owners were no exception.

On September 4, 1888, the FLEETWING arrived in Chicago with a load of Menominee lumber, and immediately took on a cargo of sundries (some type of manufactured goods or food, no doubt) and departed again for Menominee. The upbound trip was not completely without incident. Night and fog conspired to run her aground on Green Island, located in the south of Green Bay enroute to Menominee. She required three tugs to pull her off.<sup>5</sup>

There was some delay in Menominee, either in unloading and selling the "sundries", or in repairing damage from the Green Island mishap. The FLEETWING did not clear until dusk of September 26, with a load of

lumber for Chicago from the Ludington, Wells, and Van Schaick mill. The wind was fresh from the west, and building to a northwest gale. The schooner proceeded up Green Bay on a port tack, heading for Death's Door. With all canvas up, the looming bluffs of the Door Peninsula soon came into view, and the ship began preparing to change course for Lake Michigan, via the Death's Door Passage. In the darkness, the captain somehow mistook Death's Door Bluff for the smaller Table Bluff, the last headland before the Death's Door Passage. Lights at the settlement of Garrett Bay were mistaken for lights in the Door.<sup>6</sup>

The vessel shifted to its new course, unknowingly heading straight for the rocky beach of Garrett Bay. At 11:00 pm she struck the beach with a grinding crash that apparently sheared off a mast. The accounts of the wreck are somewhat conflicting; the newspapers indicate that the error was not noticed until she hit the beach, while a secondary source claims that frantic last minute efforts had been made to alter her course after the error was realized.<sup>7</sup>

Her crew made their way ashore (wading, swimming, or perhaps in the yawl) uninjured, to the nearby home of Andrew and Mary Nelson. One can imagine the Nelsons'



suprise to find a large schooner in their front yard. Due to the gale force winds, nothing could be done for the moment. The next day, the FLEETWING was found to be badly damaged. Her stern had settled, and she had nine feet of water in her eleven-foot hold. Wrecking tugs were called, but it took four days for word to get out from the remote settlement and an expedition to be assembled for Garrett Bay.<sup>8</sup>

The tug JESSE SPAULDING left Sturgeon Bay on the evening of September 30 with steam pumps, lighters, and hawser. The lumber by that time had been removed from the FLEETWING's deck, and her hold was starting to be emptied. The wind had pushed the schooner broadside onto the beach, but it was hoped that with a favorable wind she could be pumped and released into deeper water.<sup>9</sup>

There was no such luck. A northeast gale of great force sprang up not long after the SPAULDING had installed the pumps on board. Archaeological evidence (Chapter V) indicates that some attempt may have been made to patch her hull at the same time, if not earlier. The SPAULDING fled from the northeaster, running to Eagle Harbor (probably Horseshoe Harbor, near the village of Ephraim, Wisconsin.) The gale put its full force on

FLEETWING breaking her in two, and grinding out her

bottom on the rocks. Upon the tug's return, it was found that the schooner had gone to pieces, and was a total loss. She would have to be stripped and abandoned.<sup>10</sup>

Ludington, Wells, and Van Schaick were apprised of the loss, and sent the tug BURTON, two lighters, and the steambarge CITY OF NICOLLET to salvage the cargo, which was saved intact and returned to Menominee. The FLEETWING's equipment was sold to the captain of the schooner CONQUEST later that month, and the vessel was abandoned by the underwriters.<sup>11</sup> It is not known what was included in the equipment sold, be it solely the rig, or if anchors and other heavy gear were also included. While the schooner's captain and crew are reported to have returned to Chicago, the grandson of Andrew Nelson recalls hearing from his mother (one of Nelson's daughters) that a few of the men remained behind to work for Nelson over the winter, logging and quarrying, leaving in the spring for the reopening of navigation. He also recalls that the deckhouse from the schooner later came ashore and was used as a playhouse by Nelson's children.<sup>12</sup>

Captain McGraw, the part owner was in command of the FLEETWING when she struck; Finn had left her sometime between 1885 and 1888. The vessel was insured for

\$3,000, but was valued at \$5,000. The captain claimed that he had \$6,000 in repairs put into her the preceeding winter, and that he had been offered \$8,000 for the schooner just before the repairs.<sup>13</sup> It would seem from McGraw's claims that the vessel was badly underinsured, and that his financial loss was serious. No one seems to have censured McGraw for the mistaken change in course (at least not publicly; one can be sure the crew had a few choice comments).

Therefore, it seems that contemporary observers accepted the course change into the bay as an accident, brought about by the gale winds and darkness. All knew that the Door and her entrances were tricky, and required first class navigation. Yet there is something that does not quite ring true about the error. The ship had been on the Menominee run for quite some time (at least eight years, if not more), and had never had a similar mishap at Garrett Bay. Also, it cannot be found that any of the hundreds of vessels that sailed through the Door monthly ever duplicated the error.

There is the additional question of the course she laid through the Door (see Map 2). The entrance would have to have been entered on a southwest bearing of about 132 degrees to clear Waverly Shoals, after which a vessel

would bear south-southwest at about 150 degrees to head out into the open lake. To have cleared Death's Door Bluff and have struck in Garrett Bay, the FLEETWING must have been bearing almost due south from the start, about 165 degrees. If any attention at all was being paid to the binnacle, such a discrepancy would have been noticed. Therefore, one must at least consider the question; was Capt. McGraw being careless, perhaps intentionally?

The question becomes especially relevant when one considers the following article, published fourteen years earlier in the Chicago Tribune.

It was announced in these columns some time ago that the sinking of the bark Board of Trade, belonging to Capt. McGraw, of this city, has given rise to rumors that foul means had been used in sinking the vessel. The announcement made yesterday that the schr Hubbard, belonging to the same man, came very near the same fate, has strengthened the suspicions heretofore entertained against the owner and Captains of these crafts. The insurance men have been lately very uneasy on account of the dullness in marine business, which might induce evil-minded vessel owners to get rid of their crafts and pocket the insurance money. The Board of Trade was a staunch and seaworthy vessel in every respect, and everything promised a fair and remunerative trip. She had therefore no trouble to get all the insurance she wanted, and it is said that she was insured for more than she originally cost. During the entire voyage the Board of Trade had fine weather, and no anxiety was felt when she did not arrive on time. However, on the 29th of July, the National Board of Lake Underwriters received the intelligence that the bark had sunk in 13 fathoms of water off Fairport, and, with the cargo, was a total loss.

Last week the schr Hubbard, which left Oswego for this port, being also heavily insured, was found to be leaking while out at sea. The actions of the Captain, it is said, aroused the suspicions of the Steward, who kept an eye upon him. When in Saginaw Bay, he saw the Captain going below, and he shortly after followed him, and found him in the act of making another hole with an auger. The leak was stopped, and by the aid of the pumps, the vessel was taken into port, when the Captain is said to have disappeared. These circumstances have been reported to the proper parties, who have ordered a full investigation, which is now in progress.

Capt. McGraw denies any knowledge of the action of his Captains, and believes the rumors to have been maliciously circulated.(14)

McGraw remarked that the HUBBARD's captain had confessed to being crazy, and that what had happened to the BOARD OF TRADE could have happened to any vessel. He informed the reporter that the insurance investigation had yielded nothing, and the insurance had been paid. If they were satisfied, then so should everyone else.

Although the FLEETWING was not particularly well insured, the lumber market was such that an owner might just want to rid himself of that odd lumber carrier. While lake commerce in general did well in 1888 (especially in Lake Superior iron ore), lumber freights sagged. Many small schooners were forced out of the grain trade, and into the already overcrowded lumber business. Few lumber carriers made money, and some came out at a dead loss. Vessel owners complained that with

lumber shovers receiving fifty cents per hour at Menominee and sailors receiving between \$3.00 and \$3.50 per day, there was no money to be made on the week-long Chicago to Menominee run. The Chicago Tribune foretold, "the days of lumber-hookers are numbered and in a few years they will become relics of earlier times."<sup>15</sup>

Therefore, the circumstances, motivation, and precedence for the action seem to be set. Would the incidents of fourteen years earlier be forgotten in shipping circles? Several arguments are in favor of McGraw. Would he wreck a vessel after investing so much money into it, a vessel apparently worth over \$8,000? Possibly not, but we only have his word that the repairs were made (unless he was referring to the 1885 rebuilding and the 1886 and 1887 recaulkings) and that he had received a generous offer for the schooner the previous winter. Would he endanger his own life and those of his crew by a violent shipwreck in Garrett Bay? Almost definitely not. Also, the vessel may have been saved by the SPAULDING had it not been for the gale, and then the captain would have certainly lost money on wrecking tug fees.

Still, McGraw may have planned for the vessel to be completely destroyed by the northwest gale blowing when

he entered the bay. The crew could (and did) evacuate safely, due to the close proximity of shore and Nelson's lumber camp. The cargo could be salvaged, and need only be lightered a short distance back to Marinette. While the characters of Ludington, Wells, and Van Schaick seem to be of the highest caliber (they were all accorded gushing obituaries and biographies), it should be noted that from September, 1887 to March, 1888 Daniel Wells, Jr. was involved in court hearings involving illegal futures speculation in Chicago lard. While he was the plaintiff in the case, the court censured his own involvement in the dealings.<sup>16</sup>

Another question exists regarding the schooner's mortgage to James McGraw, no doubt some relative of Captain Andrew McGraw. The final mortgage of 1885 (see preceding chapter) was released in March, 1888. During the period of the mortgage, the vessel was required to be insured, and any willful damage of the mortgaged vessel would result in its loss to Capt. McGraw, so that the mortgage might be paid. This could mean that Capt. McGraw would be out his investment in the schooner, and receive no insurance money for her loss, unless the insurance money exceeded the unpaid principle on the \$4280 mortgage.

On the other hand, if the insurance money was less than the unpaid principle, which it would have been for the first year of the mortgage (assuming the vessel was insured for \$3,000 as she was in 1888), a relative might have ended up losing money on a bad mortgage. It may not have been a coincidence that the vessel wrecked six months after the mortgage was released.<sup>17</sup>

The question remains; was Capt. McGraw a scoundrel, or the victim of bad luck?

Regardless of the reasons for the FLEETWING wreck, it seemed to have had some effect on the use of the Sturgeon Bay Canal. The Marinette Eagle reported, "Vessels that have been going through the Door during the past season, now go through the canal, as the weather makes the former trip somewhat uncertain."<sup>18</sup>

One of our last glimpses of the FLEETWING comes from a curious wrecking tug.

On her return from Pilot Island last Saturday the tug Nelson ran into Garrett Bay to inspect the wreck of the schooner Fleetwing, which went ashore at that point last September. Captain Cox states that the hull is split in two in the middle, and that the only thing of value about it is the old iron.(19)

Another, more spurious explanation for the wreck remains. The FLEETWING is supposed to have carried a female cook, and the practice seems to have been on the



rise, despite widespread superstition amongst sailors about women on ships. A seaman (of somewhat dubious literacy) while dispelling something of the superstition, took his fellow lakemen to task.

. . . many of our Vessel Captains are employing women Cooks on their Vessels I would also state that the employment of such Cooks is increasing by our Lake men. were I the owner of a Vessel I would not allow a woman Cook upon my Vessel.

for the following reasons. I speak from actual knowledge. I have known two vessels to be run upon reefs and become almost a total loss for want of a proper officer on deck which mite have prevented such a calamity. Question wharew [sic] are the captain & mates? in the cabin playing and fooling with the cook. if thar had of been a man cook it is very likely his ade would have been cald for to assist in managing the Vessel.

you may ask what is to be done. men can be got to due cooking for the same wages that is paid to women cooks, & in case of necessity you have got a man to help work the Vessel instead of taking the most valuable officer to watch the cook instead of the Vessel. you Sir and the Board of marine Underwriters at Cleavland have the means at your disposal to stop this at once by sympaly saying that you will not insure any craft that has got a female cook on & by so dueing save a large amount of losses.(20)

It would be interesting to know if the FLEETWING's officers were actually on deck while approaching Death's Door.

## FOOTNOTES

<sup>1</sup>Walter and Mary Hirthe, Schooner Days in Door County, (Minneapolis: Voyageur Press, 1986), p. 33.

<sup>2</sup>Door County Advocate, 9 January, 1868; Ibid., 6 February, 1868; Hjalalmar R. Holand, History of Door County, Wisconsin; the County Beautiful (Chicago: S.J. Clarke Publishing Co., 1917), pp. 152-153; J. B. Mansfield, History of the Great Lakes, (Chicago: J.H. Beers & Co., 1899), I:259.

<sup>3</sup>Door County Advocate, 24 June, 1886.

<sup>4</sup>Door County Advocate, 6 May, 1880; Ibid., 6 May, 1881; Ibid., 23 June, 1881.

<sup>5</sup>Chicago Tribune 4 September, 1888; Door County Advocate, 15 September, 1888; Marinette Eagle, 22 September, 1888.

<sup>6</sup>Chicago Tribune, 27 September, 1888; Door County Advocate, 6 October, 1888; Green Bay Advocate 11 October, 1888; Arthur and Lucy Frederickson, Ships and Shipwrecks in Door County, Wisconsin, 2 vols. (Sturgeon Bay, Wisconsin: Door County Publishing Co., 1963), II:69-70

<sup>7</sup>Chicago Tribune, 28 September, 1888; Door County Advocate, 6 October, 1888; Frederickson and Frederickson, Shipwrecks, II:70.

<sup>8</sup>Chicago Tribune, 28 September, 1888; Ibid, 1 October, 1888; Door County Advocate, 6 October, 1888.

<sup>9</sup>Chicago Tribune, 1 October, 1888.

<sup>10</sup>Chicago Times, 5 October, 1888; Chicago Tribune, 4 October, 1888; Door County Advocate, 6 October, 1888; Frederickson and Frederickson, Shipwrecks, II:70.

<sup>11</sup>Door County Advocate, 6 October, 1888; Ibid, 20 October, 1888.

<sup>12</sup>Frederickson and Frederickson, Shipwrecks, II:70; Gordon Johnson, personal communication, August 4, 1987.

<sup>13</sup>Chicago Times, 5 October, 1888; Door County Advocate, 6 October, 1888.

<sup>14</sup>Chicago Tribune, 17 August, 1874.

<sup>15</sup>Chicago Daily Inter-Ocean, 1 December, 1888; Door County Advocate, 12 November, 1887.

<sup>16</sup>Field notes for biographical sketch of Daniel Wells, Jr., United States W.P.A. Wisconsin biography, State Historical Society of Wisconsin Archives, Madison, Field Continuity # 1.

<sup>17</sup>The 1885 mortgage consisted of four promissary notes of \$1,070 each at 7-percent interest, payable from Andrew McGraw to James McGraw at six months, one year, eighteen months, and two years from January 6, 1885. Index of Conveyances of Vessels, Port of Chicago, Record Group 41, National Archives Regional Branch Center, Chicago; Mortgage 88, Registered or Enrolled Vessels, January 6, 1885, Port of Chicago, National Archives Regional Branch Center, Chicago.

<sup>18</sup>Marinette Eagle, 13 October, 1888.

<sup>19</sup>Door County Advocate, 1 December, 1888.

<sup>20</sup>Manitowoc Tribune, 30 April, 1868.

## CHAPTER V

### FIELD INVESTIGATIONS

#### Description of the Work

Armed with a background history of the vessel known by records and oral accounts to have been wrecked at Garrett Bay, the 1986 survey team commenced on-site operations on August 4, 1986. Ten work days were allocated to the project (8/4/86 to 8/15/86) though two days were lost to bad weather. August was chosen as the best time of year for favorable weather. Environmental conditions on site were mild, with 0 to 3-foot waves, 10 to 20 feet of visibility, and a surface water temperature of 58 degrees Fahrenheit.

Project personnel consisted of two underwater archaeologists and a surface support person. The latter individual aided the archaeologists in surveying, and boat and equipment operation. Project equipment was loaned from East Carolina University, and consisted of a truck, a seventeen-foot work boat, and surveying,

mapping, drafting, excavation, and diving equipment. A small private boat was borrowed to aid with surveying.

An initial diver reconnaissance based on the author's familiarity with the site was employed to locate the major sections of wreckage. August 4 was occupied with reconnaissance and formulating preliminary identifications of the larger pieces. These sections were designated by letter in the order of their discovery, A through D for the major structural pieces, and X for a smaller piece of non-structural wreckage. The locations of two cobb-style wharf cribs were noted during the reconnaissance. However, they were deemed low-priority targets for the survey, which focused on the vessel remains themselves.

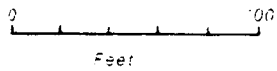
On August 5, the inshore and offshore axis of each piece were buoyed and given a code number, "1" for inshore axis, "2" for offshore axis. Therefore, the inshore end of wreckage section D was buoyed as "D1", and so forth. A datum point was established on the Garrett Bay public boat landing, which was surveyed to a nearby county survey marker. These two survey points formed the zero degree baseline for the transit station located at the landing datum. A Theodolyte transit was placed here, with an electronic distance measurer (EDM). Azimuth readings from the transit were recorded for each buoy.

With the use of a small boat, a reflector mirror was positioned at each buoy location. The EDM then measured the horizontal distance from datum.

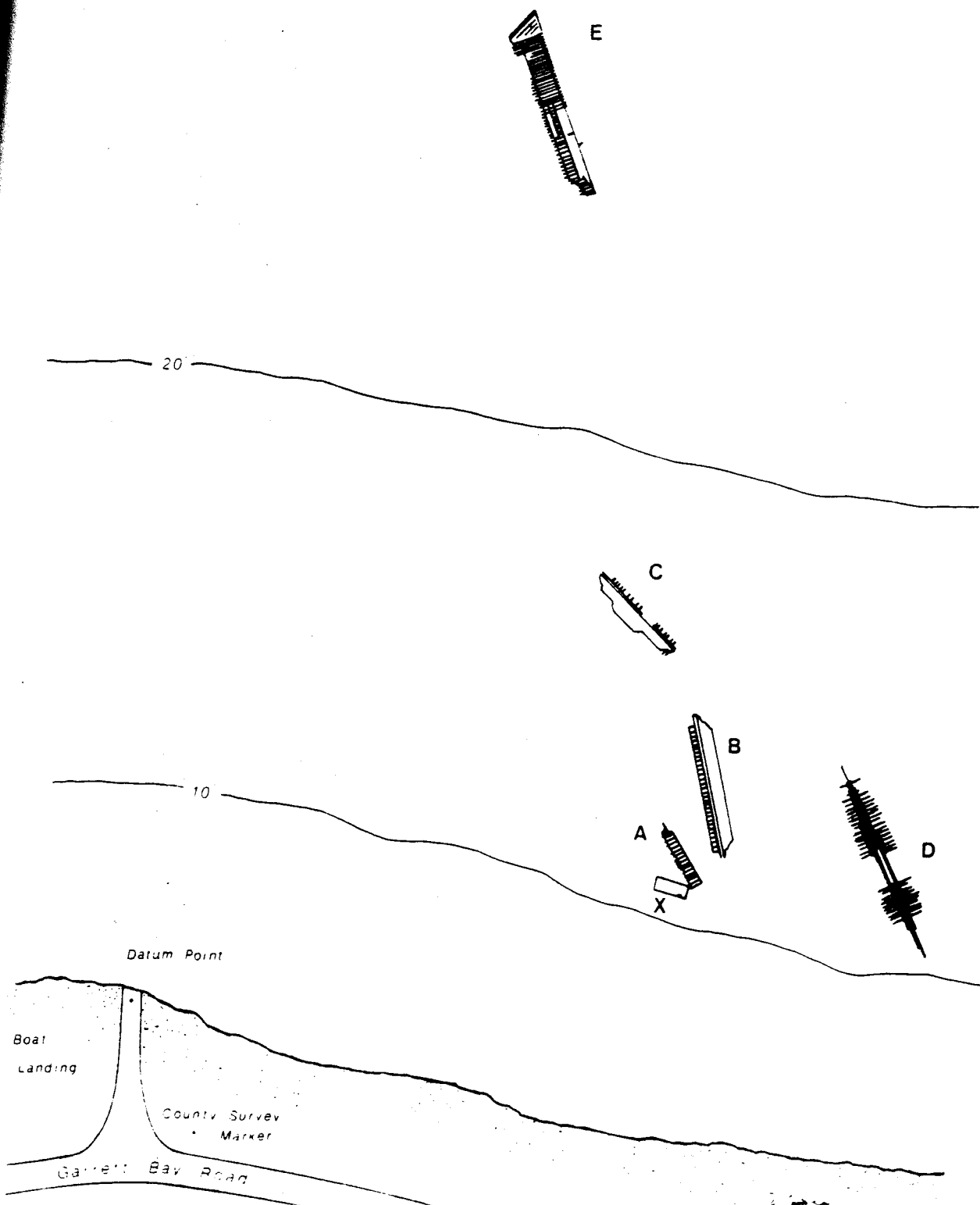
Plotting of these distances and the azimuth readings produced an accurate site map of the orientation and location of the major sections of wreckage. The buoying and surveying were done on a calm day, and the lack of tides on the Great Lakes insured that the buoys could be fastened in a vertical position over the wreckage in question. This accuracy was verified with corroborating underwater measurements.

The site was found to consist of structural portions of the hull scattered over approximately 540 feet in a northwesterly direction, probably due to the combined actions of storms and ice packs on the wreck. The quantity of wreckage observed during the reconnaissance led to the initial hypothesis that material from another vessel was obtrusive to the site. Limitations of visibility disallowed single pieces to be viewed in their entirety from a single vantage point, and extensive mapping was necessary to form a better understanding of the site.

47 Dr 168  
Garrett Bay, Wisconsin



MAP 4





*PLATE 1*

Site Area, 47DR168, Garrett Bay



*PLATE 2*

Surveying, August 1986



Mapping was conducted between 6 August and 15 August using SCUBA equipment, tape measures, and Mylar drafting film on plexiglass slates. A total of six days were devoted to underwater mapping. Part of August 12 was used to locate section E. It was buoyed and the Theodolyte and EDM were again used to add this final section to the site plan. However, at this point, the boat landing datum was destroyed by a backhoe working on the launch ramp, and all further surveying was suspended. The datum point may still be relocated from the nearby county survey marker.

A 110-foot polypropylene baseline was used to aid in mapping D, the longest section of wreckage. Additionally, a water jet was used on section B to clear overburden from several critical construction details. A five horsepower gasoline-powered waterpump was placed on the seventeen-foot boat serving as a dive platform. Using a one inch diameter flexible hose and rigid plastic jet head, high pressure water was pumped down to the wreck. The resulting jet of water was used to clear sterile sand overburden to a depth of 10 inches from around the frames and bulwark stanchions, which were identified and mapped.

When all mapping was completed, the survey bouys and baseline were removed from the site, and the jetted overburden was replaced on section B. Therefore, impact to the site was minimal. The surface environment was not effected, save for the placement of a steel nail in the boat landing asphalt to mark the datum point. The subsequent resurfacing of the boat launch destroyed this marker.

A total of twenty-four dives were made on site by the two archaeologists, for a total bottom time of twenty-six hours and twenty-eight minutes. This includes locating, buoying, and mapping the site, done over a period of eight days. These hours do not include time spent preparing equipment, conducting surface operations, or drafting. Sixteen man-days of diving were conducted.

On July 10, 1987 the author returned with an underwater photographer for additional documentation work. Two dives were conducted. The first dive was spent relocating, photographing, and collecting supplementary construction data on section E. The second dive focused on the inshore wreckage. In addition to photography, sketching, and measurement, wood samples were taken from sections C and D in an effort to identify

the material(s) employed in the construction of the vessel.

Using a brace and 1 inch diameter hole saw, sample plugs were removed from the shelf and ceiling of section C, as well as from the keelson, garboard strake, and a floor from D. The hole saw was used to cut into the wood to a depth of 1/2 inch and the resulting plug was removed with the aid of a hammer and chisel. The wood was remarkably resilient despite long immersion, and did not yield easily to the hole saw. Samples were submitted to the Forest Products Laboratory in Madison, Wisconsin for microscopic identification of cell structure.

The 1987 work involved a total of four dives between the two investigators. The combined bottom time was five hours and twenty-six minutes. Except the taking of wood samples, impact to the site was minimal.

All field work was conducted under a permit issued by the State Archaeologist, and with the permission of the Wisconsin Department of Natural Resources.

#### Description of the Findings

Section D is located on a sloping rocky bottom, running from eleven feet deep at the southeast end to

thirteen feet deep at the northwest end. Some modern detritus and flotsam has gathered along its northeast side, which seems to be the most exposed to wave action. The southwest side is better protected and shows a better state of preservation.

Of the six pieces of wreckage section D was most easily identified as a specific structural component. This section is the vessel's heavy keelson assembly and bilges, consisting of the keel, keelsons, floors, centerboard trunk, and mast steps. D is closest inshore of all the wreckage, and the largest section of the extant hull structure.

Section D exhibits double framing, with frames placed in pairs of a 4-inch sided frame and a 5-inch sided frame with 1-inch deadspace in a set. The floors and futtocks are butt-scarphed. Scarph joints are used in ship construction where single timbers are not long enough. In butt-scarphing frames, the frame ends are joined by butting two frames together, and both frames are fastened horizontally to a partner frame or double frame.

Floors are molded to approximately 9 inches, while the futtocks taper to a molded dimension of 5 inches (sections A, E) at the sheerline. Room and space

measurements are approximately equal; 10 inches. This framing pattern was found to continue throughout the hull remains, though with some variation. As some of the members are badly deteriorated or waterworn it is impossible to know the original dimensions for all the members. Double frames in section D are fastened to each other horizontally with 3/4-inch diameter iron drift pins. The floors are fastened to the keelsons with 1-inch iron drifts, passing vertically through the timbers. The floors are notched with limberholes measuring 2x6 inches.

Drift pins are iron bolts with slightly tapered ends, and were the mainstay wooden ship fastener. They were driven into holes that had been augered 1/16-inch smaller than the bolt diameter. The ends were mushroomed out with a ball-peen hammer. Clinch ringing improves the grip of a drift pin, forming a nail-like head on the fastening. Historical sources indicate that rings were made from forged iron or steel, malleable iron, or punched steel. Rings observed at 47DR168 appear to be forged iron. The ring was placed over the protruding end of a drift pin. The pin end was "upset"; hammered out over the ring with a ball-peen hammer, securely fastening the ring to the bolt. Square spikes were used for smaller

ship fastenings, such as bilge ceiling and exterior planking. All fastenings were staggered to avoid splitting the fastened timber along the grain.<sup>1</sup>

The figures show the wreckage as seen in planview (unless specified) with the fastening patterns only partially depicted for clarity. Where possible, wreckage with an original vertical orientation, such as sides of the hull, is depicted with the sheerline at the top of the drawing. Larger sections have been split into forward and aft sections to maintain detail and scale.

The bilge ceiling is completely missing from D, but surviving 1/2-inch square spikes indicate its placement over the floors and futtocks. Several strakes of exterior planking survive. The garboard and bottom strakes were found to be of stout dimensions; 15 inches wide and 2 inches thick. The vessel was well protected against the frequent groundings which marred many lake schooners' careers. Much of this planking has been water-worn or abraded on the bottom (during or after the wreck), and its preserved dimensions in some areas are considerably less than others, down to as little as 1/2-inch in thickness.

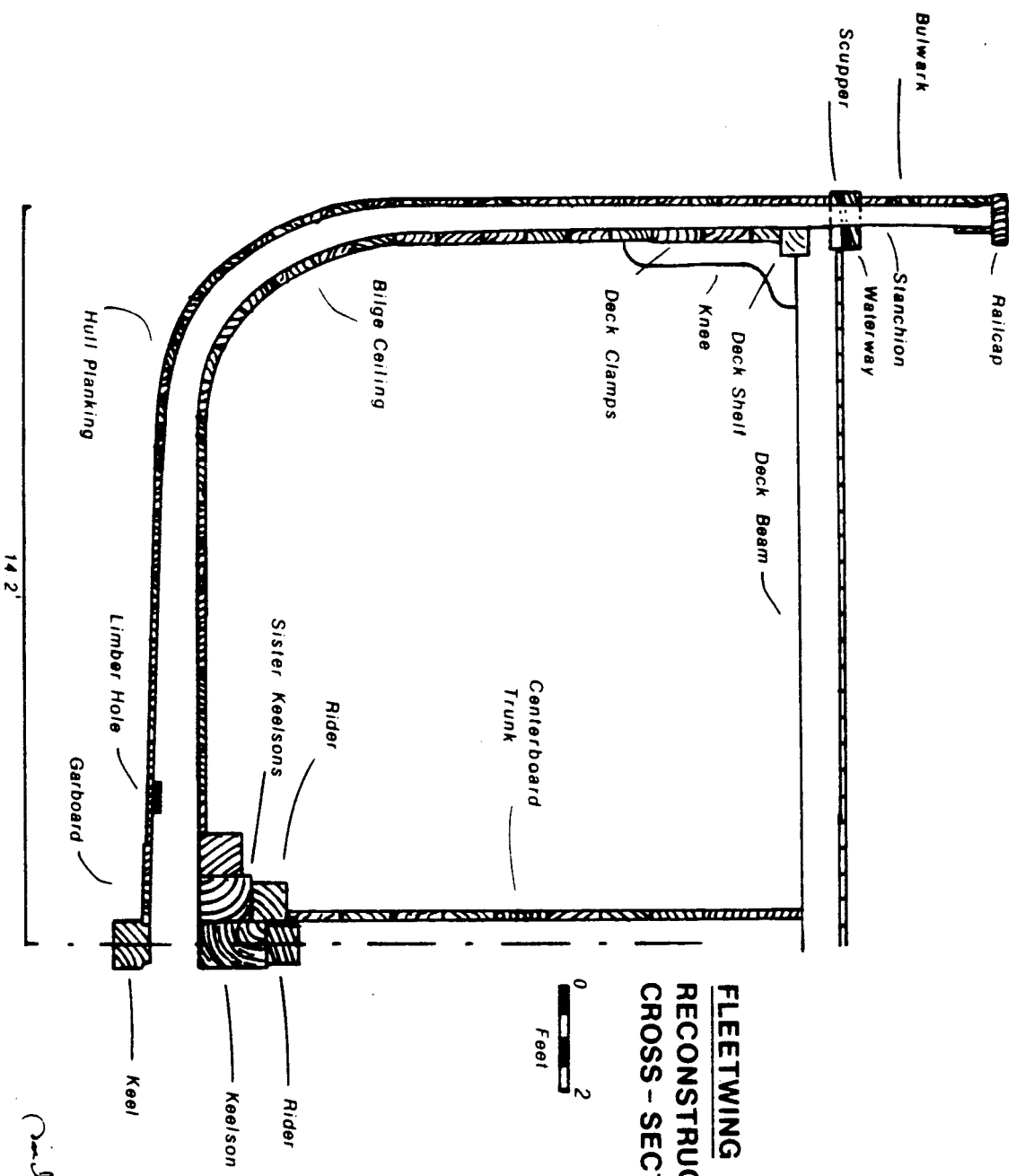
As seen in cross-section, the vessel had great longitudinal strength, evidenced by the pyramid of eight

keelsons. These longitudinal members formed a thick spine to prevent the vessel from hogging (sagging at either end), and allowed her to carry heavy cargoes. They also absorbed the lateral stress imparted by the schooner rig and allowed the keel to be pierced for a centerboard without weakening the hull. 106 feet of the keelson assembly survives. The keel is buried under rock and sand overburden, and is not accessible for measurement. The keelson measures 15x11 inches, and is flanked on either side by a 12x11-inch sister keelson and 9 1/2 x 9 1/2-inch sister keelson. The keelson and first sisters are surmounted by 11x8-inch rider keelsons. The central rider keelson on D is pierced by what appear to be three mast steps. One step is located at either end of the centerboard trunk. A third step is located on the north end of section D.

The keelson assembly is fastened vertically and horizontally with 1-inch diameter drift pins and clinch rings. The longitudinal timbers are joined with plain scarphs.

Two circular holes were augered through the keelson near both step one and three. These holes, 6 inches and 5 inches in diameter respectively, may have been accesses for bilge pumps.

FIG. 2



**FLEETWING  
RECONSTRUCTED  
CROSS - SECTION**

0 2  
Feet

Paul J. Cooper



A very interesting feature of D is its centerboard trunk. Though common on lake schooners, these have little historical or archaeological evidence to document their construction. The rider and sister keelsons form the lower sides of the trunk, which pierces the keel for passage of the centerboard into the water. The upper sides of the trunk were built up with edge-joined planks; protruding drift pins fastenings indicate their loss. Either end of the trunk has a 6x11-inch vertical timber to which the ends of these planks would have fastened. The trunk is 8 inches wide, and its surviving depth (representing the preserved height of section D) is 38 1/2 inches.

As the trunk prevents the floors from passing under the keelson, half floors were utilized in the vicinity of the trunk. These half-floors (actually only the arms of a full floor) were butted into notches along the sides of the trunk into a timber called a pocket piece.<sup>2</sup> From there the floors were fastened through to the sister keelsons located just above with 1-inch iron drift pins, as well as to the garboard strakes underneath, with 1/2-inch spikes.

Bilge ceiling planks were spiked across the upper side of the floors on section D, save for an

approximately 1-foot wide gap immediately adjacent to the keelsons. Here, a strake, the limberboard, would have been placed unfastened to provide access to the limberways below. The loss of the strakes of planking and the bilge ceiling on D has caused the half floors in the centerboard area to come free. Only three of these half floor sets survive, living a precarious existence with ice and looters.

The *raison d'etre* for the trunk was discovered ninety-seven feet to the west of section D. Section X was identified as the vessel's centerboard, uprooted from the trunk and tossed away on its side. It is a 20-foot 11-inch by 8-foot 6-inch slab of edge-joined planks. Diagnostic details included a pivot hole, slightly beveled lower edge, and fastening holes from a lifting ring strap. The centerboard was edge-joined with long 3/4-inch diameter iron drift pins. These are beginning to loosen, indeed, the edge in front of the pivot hole seems to be missing. The lack of fastenings from deck beams or cross members rule it out as being a portion of decking or a hatch. In addition, its length was found to be compatible with the trunk length on D (24 feet).

Slightly overlapping the centerboard is a 33-foot 5-inch segment of the hull, section A. The flush frame

endings distinguish the original sheerline. The frames, like the floors, were sawn to shape, as opposed to compass timber frames from the limbs and crotches of trees, which used the grain of the wood to dictate the shape of the timber. Section A consists of seventeen butt-scarphed frame sets, and ten strakes of exterior planking. 1/2-inch square spikes, 3/4-inch drift pins, and 1 1/2-inch diameter clinch rings on the upper (interior) side indicate that bilge ceiling and deck clamps had been fastened over the frames, but are now missing. The fastenings are spaced 5 inches apart. The frame, room, and space dimensions are identical to those on D. The exterior planks are 1 1/2 inches thick, and 8 inches wide.

Both sections A and X are located in fifteen feet of water, immediately north of the first drop-off shelf. The bottom here is somewhat silty, with light sediments and organic material on a bottom of medium-grain yellow sand, and scattered rock. A thin layer of overburden was found on sections A and X.

Evidence of a possible wrecking patch was found on the exterior of five frame sets on A. The upward curve of the frames at this point indicate that the patch was placed at the turn of the bilges, near the vessel's

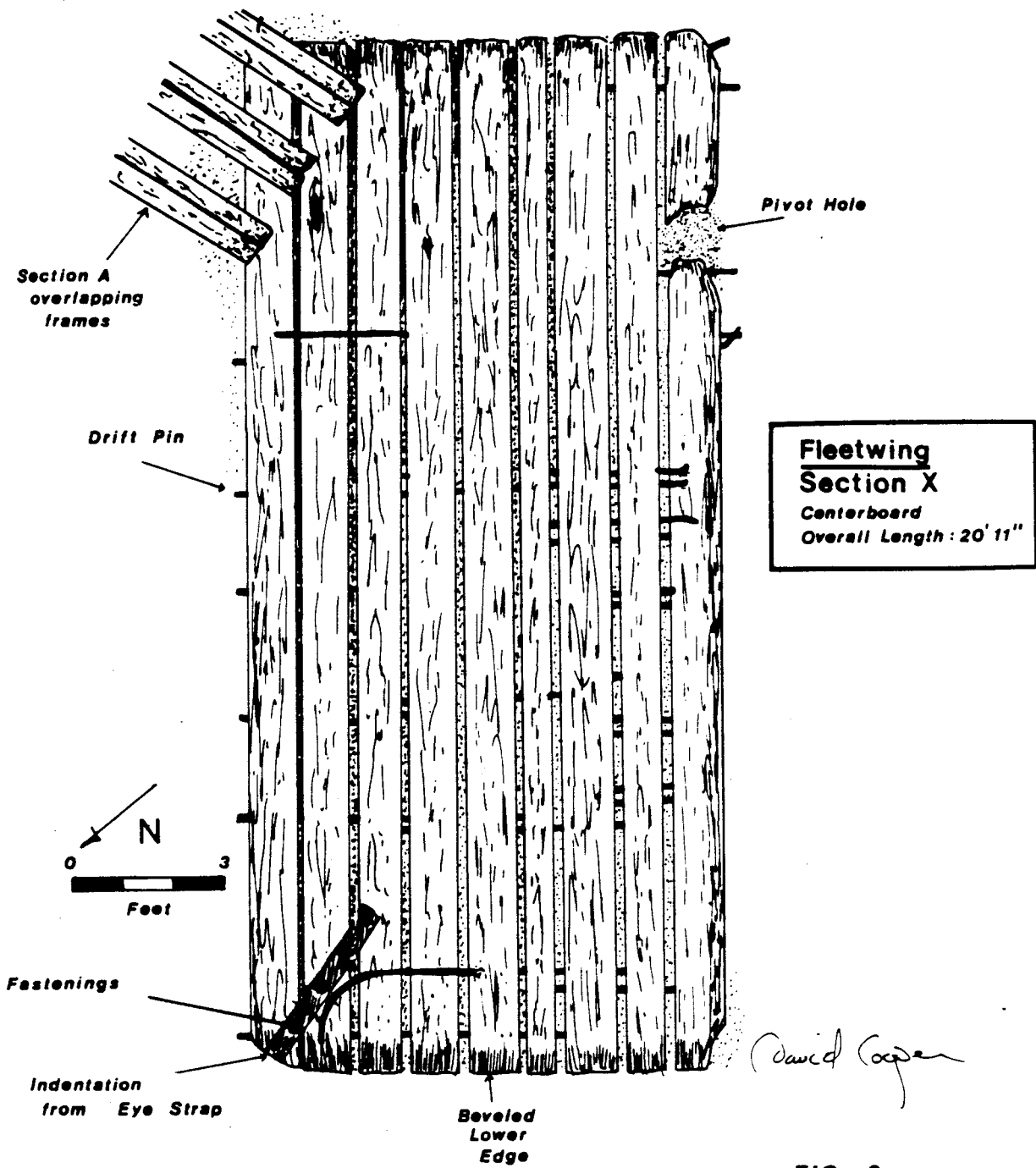


FIG. 3

**Schooner Fleetwing**  
**Section A**  
*Nail Fragment*  
 Overall Length: 33' 5"

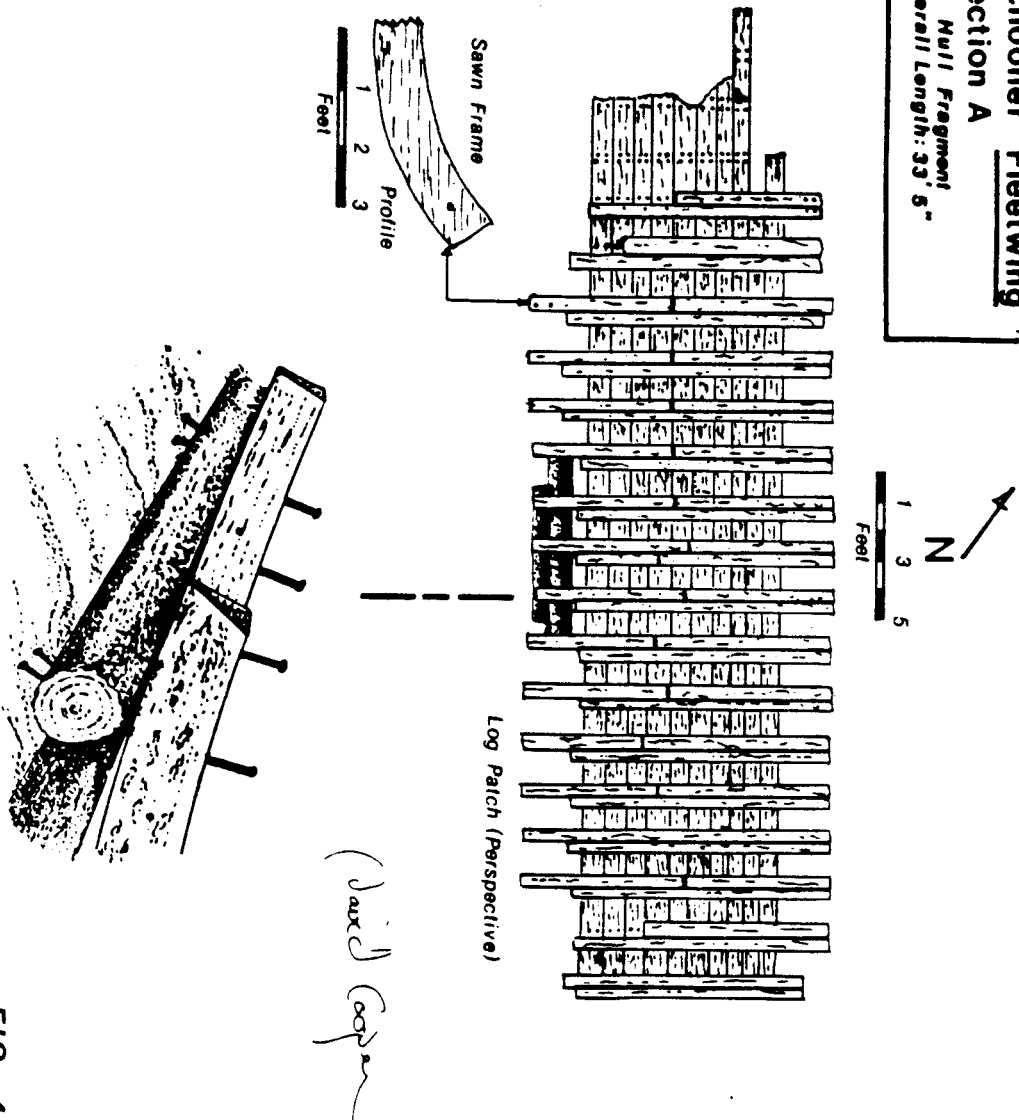


FIG. 4

bottom. Here, two logs were found nailed to the underside of the frames, in place of the exterior planking, with large 3/8-inch diameter nails. The ship's planking, like the bilge ceiling, was fastened with 1/2-inch square iron spikes. This appears to have been a hasty log patch nailed over a puncture from grounding, perhaps an effort by the crew of the SPAULDING. Comparative evidence suggests that these patches were a common expedient used by wrecking tugs when trying to pump out a stranded vessel.<sup>3</sup>

If this is indeed an emergency repair, it may suggest that the SPAULDING had somewhat more time to work on the wreck than the historical accounts indicate, and may perhaps have been using a diver. Alternatively, it may have been placed there by the FLEETWING's crew while waiting for the tug. Another explanation might be that the patch was the result of the stranding on Green Island, and may have been the cause for delay in Menominee. However, it seems difficult to believe that the captain would want to embark on a 250 mile voyage with logs nailed to his underside, or that a repair would consist of logs instead of planks, other than in an emergency.

The remains of two pier cribs are located in the vicinity of section A. One lies approximately twenty-five feet south of section A, while the second is located approximately fifty feet to the south of section C. The cribs, of probable nineteenth-century construction, are built in cobb-style, with logs stacked in a fashion similar to a log cabin. They are fastened with iron spikes, and infilled with boulders. As this material was beyond the focus of the project, it was decided following a brief investigation that time could not be spent surveying and mapping the structures.

Section B is surrounded by scattered pieces of cut dolomite. While this may have been ballast, it is more likely evidence of nineteenth-century quarrying activities at Garrett Bay. Andrew Nelson is known to have had a quarry and pier for loading stone in the vicinity.<sup>4</sup>

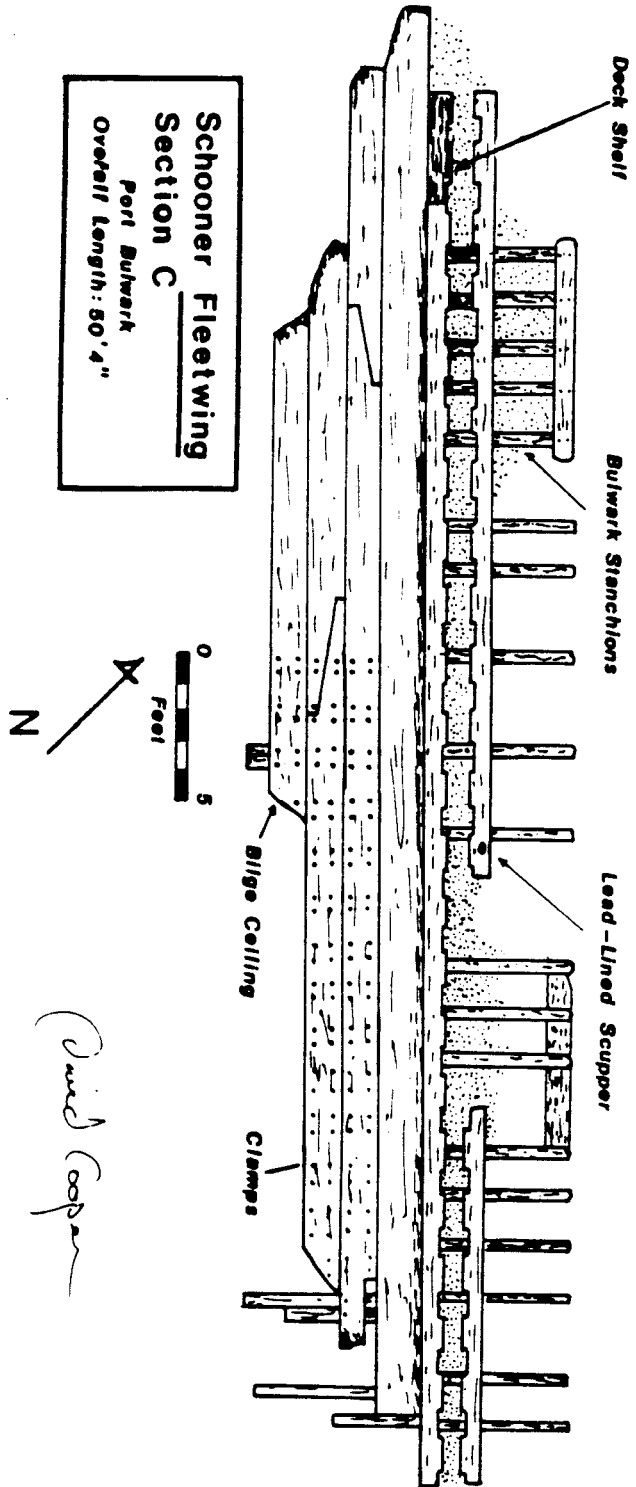
The identification of sections B and C proved rather troublesome, and were thought at first to be portions of another vessel. Rather similar in appearance, the two pieces lay near each other in approximately eighteen feet of water. C lies on a rocky bottom, with an overburden of medium-grain yellow sand, as well as some lighter sediments. B lies on a bottom of medium-grain yellow

sand, with a sand overburden. Positive identification of these pieces was not made until water jetting was conducted on the north end of section B. This, the only use of excavation equipment on the site, exposed critical construction details. These details included the hull framing pattern, the bulwark stanchions, and a chainplate. The chainplate held the deadeyes for a mast backstay or shroud.

These sections were identified as from the upper hull. The frames separated from the floors at the turn of the bilges, and ice or storms moved the hull material away from section D. The deck shelves, waterways, and bulwarks are intact, while they are missing from other similar sections such as A and E. Shelves, waterways, and deck clamps are all longitudinal stiffening members, placed inside a ship's hull so as not to interfere with her hydrodynamics. Extensive steaming and clamping was required for these members to conform with a vessel's sheer and hull lines.<sup>5</sup>



FIG. 6



The shelves and waterways sandwiched and supported the deck beams, now missing. The notches in the shelves indicate the beams were approximately 10 inches square, and were centered 25 inches apart. The shelves measure 6x6 inches and are supported by three clamps between 11 inches and 19 inches wide by 3 inches thick. The shelf is fastened over the top clamp with 3/4-inch iron drift pins. The waterways (also called covering boards) measure 13 inches wide (across the former deck level) and are 6 inches thick. Surviving bilge ceiling measures 10x2 inches.

The clamps, shelves, bilge ceiling, and waterways are scarphed together, and are fastened to the frames with 3/4-inch iron drift pins (some with clinch rings). Coaks of 2 1/2-inch diameter were also used to fasten the deck clamps securely to the frames. Coaks "are wooden dowels laid into the surface of two adjoining timbers to prevent slipping or sliding endways, i.e., longitudinally."<sup>6</sup> The coaks are fastened between adjacent clamps, and through to the frames, where they are driven between the double frames. This would prevent vertical slippage of paired frames, as well as longitudinal movement of the clamps from hull stress, thereby stiffening the hull. Similar coaks of 2-inch

diameter and 6-inch length were found in the bilge ceiling of the schooner-barge NOQUEBAY at Stockton Island by National Park Service archaeologists in 1984.<sup>7</sup>

Drift pins were found in the waterways and shelves on the inside of the hull, spaced every 18 inches, which fastened the shelves and waterways to the hull frames. Some of the pins in the shelves may also have held lodging knees. The waterways are pierced with lead lined scuppers (two in B, one in C) for draining water off the deck.

No evidence of deck beams or deck planking could be found on site. The deck has either been salvaged or was carried well away from the site by natural forces.

The bulwark stanchions measure 5 inches square, and carry through a notch in the center of the waterway to the deck shelf. Every fifth stanchion carries under the shelf and is bolted alongside a hull frame. The stanchions are spaced 15 inches apart, and form a bulwark of 32 inches in height. The bulwark on B is topped with a railcap 3 inches thick and 11 inches wide. This railcap exhibits two plain scarp joints, 4 feet in length. The fastenings for this rail are countersunk, and a wood plug of approximately 1-inch diameter has been placed in each fastening hole. A white substance was

found in these holes. Historic sources indicate that when such holes were countersunk (for rail and deck fastenings), pine plugs laid in white lead were used to cover the fastener.<sup>8</sup>

Section E is located on a rocky bottom mixed with patches of grey and pink clay. The north end lies in twenty-five feet of water, the south end in twenty-four. The largest of the outlying pieces of wreckage, it is also the most far-flung. Section E is a section of the vessel's starboard side and bow, dragged away from the main section D, probably by retreating pack ice. It measures 94 feet 3 inches in overall length.

The length and curvature of the frames on E suggest that this piece is a whole section of hull side, from sheerline to the turn of the bilges. The frames at the turn of the bilges (on the west side of E) angle upwards at approximately 35 degrees, and stand 37 inches off the bottom. Though the shelves and waterways are missing, the deck clamps survive on section E, along with three short strakes of bilge ceiling. The clamps measure 3x11 inches, the ceiling 2x10 inches.

A hanging knee on E is the only extant piece of compass timber found on site. The knee measures 40 inches long, 6 inches wide, and 15 inches in height. It

is fastened over the deck clamps with six clinch-ringed drift pins.

A chainplate is located near the knee. Its dimensions are 42 inches long (exposed length), 3 inches wide, by 1/2-inch thick. The interior diameter of the ring is 1 inch. The chainplate appears to have been hand wrought from iron or steel. It is located 74 feet aft of the stempost.

The chief diagnostic feature of E is the stempost and bow assembly. The stempost measures 17x17 inches by 19 feet 4 inches. It is straight, and is roughly semi-circular in cross-section, with the rounded edge facing forward. The stempost cants forward at approximately 72 degrees. While the breasthooks and apron are missing, surviving drift pin fastenings testify to their use.

The leading edge of the stempost is rabbetted for the exterior planking. The remains of three bobstay chainplates are in evidence, two leaving indentations 4 inches wide on the forward side of the stempost, the third leaving a piece of iron strap still bolted down.

Immediately aft of the stempost are located the angled hawseheads and knightheads, 7 inches (molded) by 6 inches (sided). The hawsehead is pierced by a 5-inch diameter hawsehole. Aft of the heads were located five sets of cant frames. The average molded dimension here was 6 1/2-inches. Sided dimensions ran from 4 inches for the foremost cant frame to 6 inches for the aftermost. In cross-section, the knightheads, hawseheads, and cant frames were all angled aft at approximately 20 degrees in a rhomboidal shape.

While attempting to relocate section E during the 1987 investigations, new unsurveyed material was encountered near section E in between 24 and 30 feet of water. This included two piles of logs and timbers of various lengths (approximately 10 to 50 feet) located in two sand pockets on a clay and dolomite-shelf bottom. One pocket was located about 60 feet east of section E, the other around 150 feet east northeast. A number of the timbers were tapered on either end, and may have been ship's spars. However, none showed any evidence of use (chafing from blocks, gaskets, or parrells). Several of the logs exhibited spike holes and were much like the timbers used in the construction of the nearby pier cribs. Others may have been cargo (either from the

wreck, or lost off the pier). Mixed with the timbers was debris from the wreck, including broken frames and planks.

## FOOTNOTES

<sup>1</sup>Charles G. Davis, The Building of a Wooden Ship (Philadelphia: U.S. Shipping Board Emergency Fleet Corporation, 1918), pp. 12-13, 59-60.

<sup>2</sup>C. Patrick Labadie, personal communication, March 1987.

<sup>3</sup>Walter and Mary Hirthe, Schooner Days in Door County, (Minneapolis: Voyageur Press, 1986), pp. 8-9.

<sup>4</sup>Illustrated Atlas of Door County, (Oshkosh, Wisconsin: Randall and Williams, 1899), Liberty Grove plat.

<sup>5</sup>Davis, Building, pp. 35-45.

<sup>6</sup>Toni Carrell, Submerged Cultural Resources Site Report: NOQUEBAY, Apostle Islands National Lakeshore, Southwest Cultural Resources Center Professional Papers, No. 7, (Washington, D.C.; U.S. Government Printing Office, 1986), pp. 55-56.

<sup>7</sup>Ibid.

<sup>8</sup>H. Cole Estep, How Wooden Ships are Built (Cleveland: Penton Publishing Co., 1918; reprint ed., New York: W.W. Norton Co., 1983), p. 81



## CHAPTER VI

### SITE ANALYSIS AND CONCLUSIONS

#### Site Analysis

All sections of wreckage located by the 1986 survey can be identified as components of a single vessel. The vessel was constructed entirely of wood, with iron fastenings. Five wood samples taken in 1987 from the keelson, floors, waterway, hull planking, and ceiling were submitted for microscopic analysis to the Center for Wood Research, U.S. Forest Products Laboratory, Madison. All samples were identified as oak (Quercus), from the white oak group. This was the most common construction material for wooden Great Lakes ships of this period.<sup>1</sup>

The centerboard indicates the vessel was a sailing ship, and most probably a schooner. She was very flat-floored with relatively straight sides. The vessel was double framed, using butt-scarphs. A pattern of

5-inch sided frames paired with 4-inch sided frames is found in all the wreckage, with only slight deviation. As many of these frames exhibit abrasion and erosion, this deviation may be the result of poorly preserved original surfaces.

Room and space measurements on all pieces of wreckage are consistent (10 inches) with a slight deviation of an inch in either direction. This may also be a problem of preservation, as some of the frames have been visibly loosened. It is equally likely that these pattern deviations may reflect some irregularity in the original construction or later rebuilding. While an effort to use standard dimension members was made by the builders, the results indicate some variability in dimension.

Analysis of the surveyed remains shows that the vessel had a length on keel of at least 106 feet, with an overall length of at least 127 feet 7 inches, and a height from keel to deck of approximately 16 feet at the bow. As the hull is broken up, and no decking can be found, no estimate can be made on the original vessel's beam.

### Section E

The presence of the stempost, hawseheads, and bobstay chainplates clearly diagnose this section as the bow and starboard side of the vessel. The angle of the stempost, and orientation of the knee and chainplate leave no doubt as to the direction of the deck level. The frame dimensions generally follow the 5-inch/4-inch pairing. Having identified the bow, and having noted the framing pattern, it appears that the 5-inch frame was placed on the forward side of a frame pair, the 4-inch frame being bolted aft. As noted, this is a general pattern only, but can be used as a guide in determining the original orientation of the other wreckage sections.

### Section A

The sheerline of A is identified by the flush frame ends, as well as the curve of the frames at the bilge line on the opposite side. The framing pattern indicates that this was probably a piece of starboard side. Combined with section E, an overall 127 feet 7 inches of starboard side is preserved. E at its widest point (cant frames) measures 16 feet 2-1/2 inches; A at its widest point measures 10 feet 3 inches.

### Sections B and C

The chainplate, rail, and bulwark clearly indicate the former deck level. The framing pattern indicates that these were probably sections of the vessel's port side. Their overall lengths make them rather long to add onto the existing starboard side fragment, even individually, while still keeping to the dimensions of the keel section. Therefore, they must have come from the upper port side of the hull. Total length on these sections indicate that 124 feet 7 inches of port side survives.

### Section X

The centerboard dimensions, proximity of the piece, and lack of wreckage from another vessel in the vicinity indicate that the centerboard in question was associated with section D. The size closely matches the dimensions of the centerboard trunk on section D. In construction it closely matches the centerboard of the lake schooner ALVIN CLARK, suggesting that a standard design was used. However, the CLARK'S board was offset from the keel, while the board on 47DR168 was positioned on the vessel's centerline.

#### Section D

A comparison of the framing pattern found here with that of section E indicate that the north end of this section was probably the bow. Also, considering the location of the centerboard trunk in relation to the mast steps, it seems most likely that section D is facing stern-on to the beach. This is not surprising; the bow of a stopped vessel has a natural inclination to head up into oncoming seas.

The identification of the mast steps is still tentative; nothing else resembling maststeps exists on section D, and no better explanation has been forwarded for the existing constructions. It is always possible that these actually were steps for deck stanchions, and that the mast steps somehow do not survive.

Unfortunately, due to the poor preservation of section D, it is not known what the original keel length would have been, therefore it is impossible to tell precisely how D and E formerly articulated. Placing the stempost directly on the bow end of section D puts the chainplate on E in the vicinity of the number 3 step, indicating that it probably held a mast. Comparison with existing construction evidence from the two-masted ALVIN CLARK, and the three-masted LUCIA SIMPSON indicate that

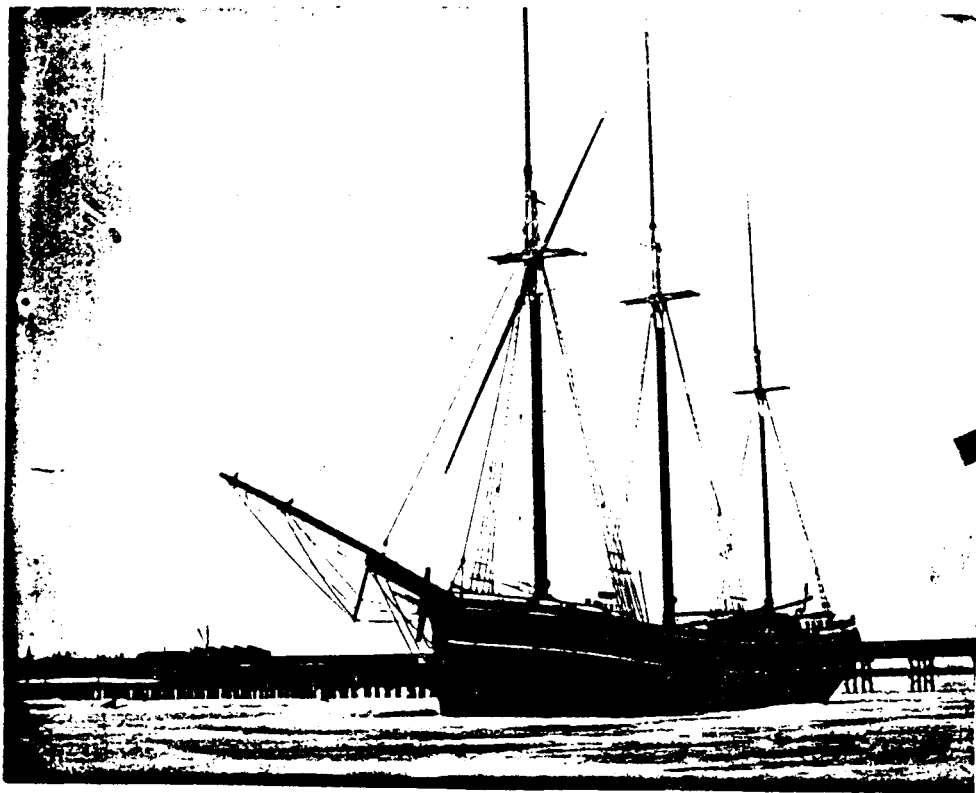
the foremast was stepped well forward on a two-masted schooner, with the mainmast stepped into the keelson directly aft of the centerboard trunk. A three-masted schooner was similarly rigged, but with a mizzen stepped well aft through the after deckhouse. In this configuration, the distance between foremast and mainmast would have been slightly longer than the distance between mainmast and mizzen. In both cases, the centerboard trunk is located slightly forward of amidships.<sup>2</sup>

Hypothetically then, step 1 would have been the foremast step, and step 3 the main step. This would allow for a foremast mainsail boom of approximately 40-foot length. The mizzen step (if one had existed) would have been located on the south end of section D. Step 2 may have been part of the centerboard trunk, or have held a stanchion for the centerboard winch. Alternatively, with the south end of D as the bow, step 2 may have been the mainmast step. In both cases, the chainplate from E seems to have been for the mainmast. However, the second theory places the other steps awkwardly close to the mainstep. Additionally, the framing pattern seems to indicate that the south end of D was actually the stern. In any case, all three steps are located too close together for all to have held a mast.

At least one of these steps must have supported something other than a mast (such as a stanchion for heavy overhead deck equipment).

The positive identification of mast steps would help answer an existing question about the FLEETWING. While the 1885 mortgage for the FLEETWING indicates that she had only two masts, a photograph reputed to be of the FLEETWING and a later account indicate that she had three.<sup>3</sup> It is unclear whether the mizzen in the photo is the result of a later rerigging, or if the photograph is of another vessel. The photograph is reputed to have been taken in the winter of 1887 at Sturgeon Bay, of the FLEETWING frozen in for hull repairs. Actually, the FLEETWING laid up in Chicago with the lumber fleet that winter.<sup>4</sup>

The photograph is part of a collection of glass negatives taken by Herbert Scofield in Sturgeon Bay. The State Historical Society of Wisconsin's records indicate that the collection dates approximately to between 1888 to 1898.<sup>5</sup> Obviously, unless the photograph were taken sometime prior to the winter of 1887, it cannot be of the FLEETWING, as she was in Chicago in 1887, and on the bottom of Garrett Bay by 1888.



*Courtesy State Historical Society  
of Wisconsin*

**PLATE 3** Photo Identified as Schooner FLEETWING,  
in Winter Quarters Around 1887



If the existing historical account and photograph are correct, then somehow the FLEETWING was rerigged without it being noted on her enrollment. Uprigging from two to three masts was fairly common, and could be accompanied by a lengthening of the vessel.<sup>6</sup> No evidence for a lengthening was found on the 47DR168 wreck. The vessel depicted in the photograph is a wooden topsail schooner with a full bow, graceful sheer, and after deckhouse. Unfortunately, a shadow under the bowsprit prevents identification of the figurehead, if one was present. The FLEETWING had an eagle figurehead. As the vessel is viewed from the port bow, her stern is not visible. The FLEETWING had a half-round stern.<sup>7</sup> The angle of the vessel also prevents an accurate study of the relative positions of the masts for a comparison with the archaeological evidence.

From rough measurements of the vessel depicted in the photograph, it can at least be asserted that nothing in the photo specifically contradicts the archaeological and historical evidence. The straight stempost and location of the hawsehole are almost identical, as are the relative dimensions of the bulwark, chainplates, and exterior planking. It is not known at present how many of these vessel characteristics were standardized, and

therefore typical of many lake schooners. Certainly, manufactured items such as chainplates and hull planking must have had similar dimensions. Estimates of the length of stempost and height of masts can also be made; the relative proportions are close to those of the FLEETWING.

While none of this is conclusive, it can be said that the vessel depicted in the photograph is not dissimilar from that wrecked in Garrett Bay.

As to the wreckage itself, the archaeological findings, historical material, and oral accounts all indicate that that site 47DR168 is most likely the remains of the FLEETWING. The surveyed remains closely parallel the known size of the schooner, historical accounts do not indicate that any other vessels were wrecked in the immediate area, and oral accounts (passed down from Nelson's daughter, alive at the time of the wreck) unhesitatingly identify the wreck as the FLEETWING. Unfortunately, diagnostic features noted on the FLEETWING's enrollments (figurehead, and half-round stern) do not appear to have survived, nor do her lumber loading ports (noted at the time of her launch).<sup>8</sup> These ports may be located in an undiscovered or missing piece of wreckage. While complete certainty is usually beyond

the reach of the social scientist, extensive research has failed to produce an alternate identification for the vessel.

In the course of documenting the surviving remnants of the FLEETWING, a number of basic questions were answered about her construction. Additional survey work could reveal even more wreckage (such as the missing decking) in the deeper water north of section D. Diver reports indicate there also may be additional wreckage to the west of the site. Use of side-scan sonar and a magnetometer would facilitate such a search. Additional survey work should include the pier cribs, as well as the log/debris piles east of section E. Documentation of the site could also include a photomosaic of the entire wreck; photographic work in 1987 was directed at specific construction details. This research would produce an even more complete picture of the site, as well as provide additional data on the marine architecture represented there.

Though the problems of looting are irreversable, an effort could be made to locate and study material removed from the wreck to answer additional questions. Presently, knowledge of the FLEETWING's shipboard life is sketchy, and can only be gleaned from the historical

accounts. Removed artifacts may answer questions about her living and working conditions, as well as maintenance, fittings, rigging, and cargo.

Unfortunately, interpretation of this material would be difficult after loss of provenience. The original provenience of the anchors and windlass is presently unknown; a diver report indicates that these came from the bow area of the wreck, perhaps the bow structure at section E.<sup>8</sup> Another witness recalls seeing portions of the windlass gears about 75 feet northeast of the pier cribs; the approximate location of sections B and C.<sup>9</sup> If this material was actually from the schooner FLEETWING, then it is apparent that the equipment sold to the schooner CONQUEST from the wreck did not include the anchors or windlass, and that the report of the tug NELSON regarding the lack of any items of value left on the wreck must be slightly amended.<sup>10</sup>

A curb to future looting on all underwater sites in Wisconsin necessitates a more active program in submerged cultural resource preservation. This would require more explicit protective legislation and enforcement, a submerged site inventory program, and efforts at public education. The extensive damage done to the FLEETWING by

sport divers is testimony to the need for greater protection of these historic sites.

While the wreck requires some efforts at protection, much of the damage has already been done. Ice seems to have taken the greater part of its toll, and there is relatively little left for divers to disturb without mechanical assistance. Though National Register nomination should at least be considered, the already battered condition of the wreck and the existence of better-preserved sites in Wisconsin waters suggests that a nomination be reserved for more intact, historically significant sites. The FLEETWING's history may not be an uncommon account. None the less, it is the commonness of the FLEETWING that is a rewarding aspect of her study. It is hoped that encompassing state protection legislation will be sufficient to preserve this site. Presently, responsible residents of Garrett Bay act as informal "watchdogs", actively discouraging the removal of archaeological materials. Also, some sport divers in the area are demonstrating an increased sensitivity to submerged cultural resource protection. This is especially true of the charter dive services, many of which have noted a loss of sport diver interest in the

Door County area following the scavenging of the better-known wrecks.

The FLEETWING is of interest as a representative study of a post-Civil War merchant schooner on the Great Lakes. Her transitions in ownership and cargoes present an interesting cross-sectional study of schooner use during the decline of lake sail. These sturdy vessels braved lake gales, winter ice, hard times, and increasing domination by steam, yet were crucial to the economic development of the Great Lakes region. The questions regarding her loss provide new historical perspectives on the complexities of Great Lakes navigation, economics, and marine underwriting. Archaeologically, the FLEETWING is a valuable source of data on the requirements, peculiarities, and traditions of Great Lakes wooden shipbuilding.

Such surveys as the FLEETWING project have merit in their brevity and low expense, while still producing a sizeable data base. Underwater surveys are beneficial to both academic and cultural resource management projects, and should become more of a priority to the Great Lake states, with their rich but inadequately documented maritime heritage.

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<sup>1</sup>H.C. Inches, The Great Lakes Wooden Shipbuilding Era (Cleveland: Cleveland Offset Corp., 1962), pp. 2-5.

<sup>2</sup>McCutcheon, C.T., Jr. "Alvin Clark: An Unfinished Voyage," Wooden Boat 52 (May/June 1983):58; H. C. Inches, The Great Lakes Wooden Shipbuilding Era (Cleveland: Cleveland Offset Corp., 1962).

<sup>3</sup>Arthur and Lucy Frederickson, Ships and Shipwrecks in Door County, Wisconsin, 2 vols. (Sturgeon Bay, Wisconsin: Door County Publishing Co., 1961-3), II:69-70

<sup>4</sup>Chicago Tribune, 1 December, 1887.

<sup>5</sup>File #1552, State Historical Society of Wisconsin Iconography Collections, Madison.

<sup>6</sup>Hirthe and Hirthe, Schooner Days, p. vii, x.

<sup>7</sup>Enrollment 144, Port of Chicago, 7 May, 1881, Record Group 41, National Archives Regional Branch Center, Chicago.

<sup>8</sup>Manitowoc Pilot, 16 August, 1867.

<sup>9</sup>Richard Boyd, personal communication, June 1987;

<sup>10</sup>Gordon Johnson, personal communication, August 1987.

<sup>11</sup>Door County Advocate, 20 October, 1888; *Ibid.*, 1 December, 1888.

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## APPENDIX A

ENROLLMENT DATA; SCHOONER FLEETWING

Official Number: 9883

<u>Port</u>	<u>Date</u>	<u>#</u>	<u>Owners</u>	<u>Master</u>
Milwaukee	9/03/67	E22	S. Goodenow (1/2) P. Johnston (1/2)	L. Simpson
Chicago	9/09/69	E47	S. Goodenow " P. Johnston "	J. Harlder
Milwaukee	10/01/72	R1	S. Goodenow " P. Johnston "	?
Chicago	12/05/72	E90	S. Goodenow " P. Johnston "	J.B. Chandler
Chicago	7/24/73		S. Goodenow " P. Johnston "	M.D. Howard
Chicago	2/12/74	E115	S. Goodenow (1/3) P. Johnston " J. Pederson "	J. Pederson
Chicago	3/11/80	E97	" (2/6) J.C. Spry " J. Spry (1/6) H.H. Gardner "	"
Chicago	9/04/80	E33	J. Pederson (2/6) J.C. Spry " J. Spry (1/6) H.H. Gardner "	"
Chicago	5/07/81	E144	J. Spry (1/3) A.L. McGraw (2/3)	E. Finn
Chicago	11/08/88	"	Enrollment Surrendered; Vessel Lost	

## APPENDIX B

CONSTRUCTION DATA; SCHOONER FLEETWING\*

Launched: Manitowoc, Wisconsin, 8/10/67

Builder: Henry B. Burger

Lost: Garrett Bay, Wisconsin, 10/1/88

Comments: Two masts, eagle figurehead, half-round stern,  
lumber loading ports on both sides of hull.

## VESSEL DIMENSIONS

Length on Keel (1867):	136.0'	Foremast:	86 feet
	(1880): 135.3'		
Beam (1867):	28.5'	Mainmast:	88 feet
	(1880): 28.4'		
Depth of Hold (1867):	11.6'	Topmasts:	60 feet
	(1880): 11.5'		
Total Tonnage (1867):	349.78		
	(1880): 320.12		
Gross Tonnage (1881):	320.12		
Net Tonnage (1881):	304.12		

## SCANTLINGS

## Frames and Floors

Framing Pattern: Double, butt-scarphed, white oak.

Deadspace: 1"

Frames, Sided: 4"/5"

Frames, Molded: 11" (floors), 8" (turn of bilges),  
5" (sheer).

Limberholes: 2"x6"

Room: 10"

Space: 10"

Bow

Stempost: 19' 4" x 17" x 17"

Hawseheads, Knightheads: sided 6"; molded 7"

Hawsehole: 5" diameter

Cant Frames: sided 4-6"; molded 6 1/2"

Longitudinal Members

Keel: Unknown

Keelson: 11"x15", white oak.

First Sister Keelson: 11"x12"

Second Sister Keelson: 9 1/2" x 9 1/2"

Rider Keelsons: 8"x11"

Ceiling: 2"x10", white oak.

Clamps: 3"x11-19"

Deck Shelves: 6"x6"

Waterways: 6"x13", white oak.

Garboard Strake: 2"x15", white oak.

Exterior Planking: 1 1/2" x 8"

Log Patch: 6 1/2-8" diameter logs.



## Bulwark

Bulwark Stanchions: 5"x5"

Railcap: 3"x11"

Bulwark Height: 32"

## CENTERBOARD AND TRUNK

Centerboard: 20' 11" x 8' 6" x 2"

Trunk Interior: 24' x 8"

## DECK SUPPORTS

Knees: 40"x15"x6"

Deck Beams, Estimate: 10"x10", on 25" centers.

## FASTENINGS

Keelson Assembly, Floors: 1" diameter iron drift pins, 1 1/2" diameter iron clinch rings.

Planking, Ceiling: 1/2" square iron spikes.

Deck Clamps: 3/4" diameter iron drift pins, 1 1/2" diameter clinch rings, 2 1/2" diameter wooden coaks.

Deck Shelves and Waterways: 3/4" diameter iron drift pins.

Knees: 3/4" diameter iron drift pins, 1 1/2" diameter clinch rings.

Railcap: 1/2" square spikes countersunk, 1" pine plugs.

Centerboard: 1" iron drift pins.

Log Repair: 3/8" diameter nails.

#### FITTINGS

Chainplates: 1/2" thick x 3" wide, original length  
unknown.

Bobstay Chainplates: 4" wide, original length unknown.

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\*Vessel dimensions from historical records, construction  
data from archaeological survey.