

Matthew A. Russell. AN HISTORICAL AND ARCHAEOLOGICAL INVESTIGATION OF THREE BEACHED SHIPWRECK SCATTERS AT CHANNEL ISLANDS NATIONAL PARK. (Under the direction of Dr. Bradley A. Rodgers) Department of History, January 1996.

This thesis documents archaeologically and historically three beached shipwreck scatters in Channel Islands National Park, California. During the fall and winter of 1993-1994, archeological investigation and analysis of these shipwrecks were conducted at Channel Islands National Park. The sites were systematically tested to determine association with three Pacific coast lumber schooners, built by the Hall Brothers Shipyard of Puget Sound. This report demonstrates that, even though the wreck scatters offer only a scant material record, it is possible to interpret disarticulated vessel components and determine whether these scatters represent remains of the Hall Brothers' schooners.

The vessels, *Dora Bluhm*, *Comet*, and *J.M. Colman*, are placed in the historical context of the nineteenth century Pacific coast lumber trade, and the evolution of a distinct vessel-type, the Pacific coast lumber schooner, is analyzed. In addition, each schooner's role in the lumber trade is discussed. Finally, management recommendations are offered to assist National Park Service resource managers in the on-going interpretation and preservation of these archaeological resources.

AN HISTORICAL AND ARCHAEOLOGICAL INVESTIGATION
OF THREE BEACHED SHIPWRECK SCATTERS AT
CHANNEL ISLANDS NATIONAL PARK

A Thesis

Presented to

the Faculty of the Department of History
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by

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As concerning ships, it is that which every one knoweth, and can say, they are our weapons, they are our ornaments, they are our strength, they are our pleasures, they are our defence, they are our profit; the subject by them is made rich, the kingdom through them strong, the prince in them mighty; in a word, by them in a manner we live, the kingdom is, the king reigneth.

The Trade's Increase
London, 1615¹

The history of the past [of Washington Territory] is interesting, only so far as it shows the discovery of the Territory, but when the resources of the country are developed, when its magnificent forests are transformed into floating palaces. . .then will the Territory enter upon its real history.

*Business Directory and Guide
to Washington Territory,*
1872²

INTRODUCTION

Before discovery of gold at Sutter's mill in late 1848, maritime activity on the United States's Pacific coast was limited. The California Gold Rush, however, sparked a mass migration westward that changed the history of the Pacific coast forever. The sudden influx of thousands of people created an instant market for every kind of good imaginable. Foremost among these goods was lumber. Virtually unlimited supplies of lumber were needed for the construction of the emerging Gold Rush cities, as well as the burgeoning metropolitan areas in southern California.

Before the Gold Rush, exploitation of Pacific Northwest timber stands progressed at a slow pace. With the sudden demand for lumber in California, however, sawmills appeared throughout Puget Sound, Oregon, and California by the dozens. The most economical way to transport lumber to the San Francisco and southern California markets was by sea. This prompted the emergence of a vessel-type that was uniquely suited to the conditions of this trade: the Pacific coast lumber schooner. Pacific coast environmental conditions dictated the design and construction of hundreds of vessels engaged in the coastal lumber trade. The lumber schooner, from its emergence in the 1850s until after World War I, became the most important type of vessel involved in the west coast lumber trade. These schooners played a vital

role in the California development, supplying raw materials necessary to build virtually every city in the state, as well as supplying needs in the American southwest, Mexico, and South America. Historically, the Pacific coast lumber schooner represents an extremely significant vessel-type. These vessels never broke any speed records, are not associated with any national figures, did not engage in any famous naval fleet actions, nor had any masterpieces of American literature written about them, but they had a more substantial, lasting impact on Pacific coast history. The fact that California developed into one of the most economically important regions in the world is largely a tribute to the unflagging determination with which the lumber schooner plied the coast, propagating this mundane but vital trade.

Of the dozens of shipyards that appeared on the Pacific coast in response to the demand for vessels of all kinds, a handful became recognized for the high quality of their work. Their names became synonymous with west coast shipbuilding. The Hall Brothers Shipyard of Puget Sound was one of these. The three Hall brothers, Winslow, Isaac, and Henry, learned their trade in Massachusetts and operated a yard there until they moved to the west coast. From 1874 to 1903, the Hall Brothers built 108 vessels at their yard in Puget Sound, first at Port Ludlow, then at Port Blakely. The majority of these vessels were coastal lumber schooners.

Unfortunately for their owners, but fortunately for us, several Hall-built schooners grounded, foundered, and wrecked at various points along the coast. Although this is not surprising, there exists in Channel Islands National Park, California, a unique situation. Three Hall-built lumber schooners, *Dora Bluhm*, *Comet*, and *J. M. Colman*, wrecked on these islands between 1905 and 1911. Ironically, the schooners, which wrecked within six years of each other (*Dora Bluhm* on Santa Rosa Island, *Comet* and *J. M. Colman* on San Miguel Island), were built by the Hall Brothers in a five year period: *Dora Bluhm* in 1883, *Comet* in 1886, and *J. M. Colman* in 1888.

The purpose of this thesis is two-fold. First, to document the history of the Pacific coast lumber trade, identify the role of the lumber schooner within that trade, and document the careers of three representative lumber schooners. Second, to conduct an archaeological investigation and documentation of remains possibly belonging to *Dora Bluhm*, *Comet*, and *J. M. Colman*, located in Channel Islands National Park. At the present time, only one Pacific coast lumber schooner, *Neptune*, a Bendixsen-built vessel, has been archaeologically documented.³ Pacific coast lumber schooners are important enough and their construction techniques so little understood that even scant remains should be examined with care. The rarity of lumber schooners in the archaeological record and the

potential remains of three in close proximity prompted the field research reported in this thesis.

The sites examined for this project consist of widely scattered, beached shipwreck remains. Everything observed was either located in the intertidal zone or lying above the high-tide line. From the outset it was known that these wreck scatters would likely produce nothing in the way of articulated wreckage. Often, scattered sites like these are dismissed as unintelligible and go unrecorded. In his contribution to Gould's *Shipwreck Anthropology* (1981), archaeologist Larry Murphy notes that "to dismiss scattered sites because of preconceived notions about the information they may contain is a serious and unnecessary mistake that will compromise the amount of information ultimately obtainable from the shipwreck data base."⁴ Whether this statement is applied to sites containing scattered artifacts with little remaining hull structure, like many shipwrecks found in Florida waters, or to widely scattered hull components of beached shipwrecks, it holds equally true. This field work is a demonstration that careful mapping and observation of scattered sites can give insight into natural site formation processes and can "offer a data base for understanding distribution processes, which is basic to developing predictive models for the 'break up' of wooden shipwrecks."⁵ It is therefore vital that scattered, beached shipwreck sites are not dismissed as archaeological

resources because of untested assumptions of their lack of worth.

The driving questions behind this study were: do the wreck scatters found at Northwest Cove, Point Bennett, San Miguel Island and Cluster Point, Santa Rosa Island (locations consistent with the documented wreck sites of *J. M. Colman* and *Dora Bluhm*, respectively) actually represent the remains of the Hall-built schooners? And do these wrecks contain diagnostic characteristics that could identify them with Hall-built ships? To answer these questions, both sites were systematically recorded and analyzed, and interpretations made as to possible associations with the historically documented vessels. In addition, because the wreck located in Simonton Cove, San Miguel Island, has been conclusively identified as *Comet*, an attempt was made to uncover and document the remains. Natural forces exposed vessel structure, which was photographed in 1984. These remains have since been recovered. In addition, project personnel conducted a terrestrial magnetometer survey around *Comet's* remains to test for the possibility of additional buried wreckage.

This project was supported from start to finish by Channel Islands National Park and the National Park Service's Submerged Cultural Resources Unit. The results of this study should provide resource managers with information necessary to make appropriate decisions regarding the long-

term preservation of these sites. This report demonstrates that the study of even scant shipwreck remains can significantly contribute to the knowledge of our collective maritime heritage.

NOTES

¹*The Trade's Increase, 1615*, quoted in Eliot Grinnell Mears, *Maritime Trade of the Western United States* (Stanford, CA: University of Stanford Press, 1935), 1.

²*Business Directory, and Guide to Washington Territory* (Olympia, Wash.: Murphy & Harned, 1872), 13.

³James P. Delgado, "Documentation and Identification of the Two-Masted Schooner *Neptune*," *Historical Archaeology* 20: 1 (1986): 95-108.

⁴Larry Murphy, "Shipwrecks as Data Base for Human Behavioral Studies," in *Shipwreck Anthropology*, ed. Richard A. Gould (Albuquerque, NM: University of New Mexico Press, 1981), 77.

⁵Delgado, "Two-masted Schooner *Neptune*," 107.

CHAPTER I

SITE DESCRIPTION

Location

All three sites investigated in this study are located in Channel Islands National Park, California (Figure 1). The Northwest Cove Site is located on the northwest side of Point Bennett, San Miguel Island, California, at Universal Transverse Mercator (UTM) coordinates N 3768961.9, E 735507.4 (Zone 10). The site covers an area of approximately 650 feet by 360 feet, with two distinct scatters: one lying in the rocky intertidal zone offshore; and the other located well above the high-tide line on a hard-packed sand beach.

The *Comet* Site is located in Simonton Cove on the northern shore of San Miguel Island, California. The site's exposed portion is highly compact and lies approximately forty feet above the high-tide line on a sandy beach, about six hundred feet northeast of a United States Navy range pole.

The Cluster Point Site is located on the southwest side of Santa Rosa Island, California, at UTM coordinates N 3757150.3, E 761035.7 (Zone 10). The site covers an area approximately 575 feet by 100 feet, located on a sandy beach and among small dunes above the high-tide line.

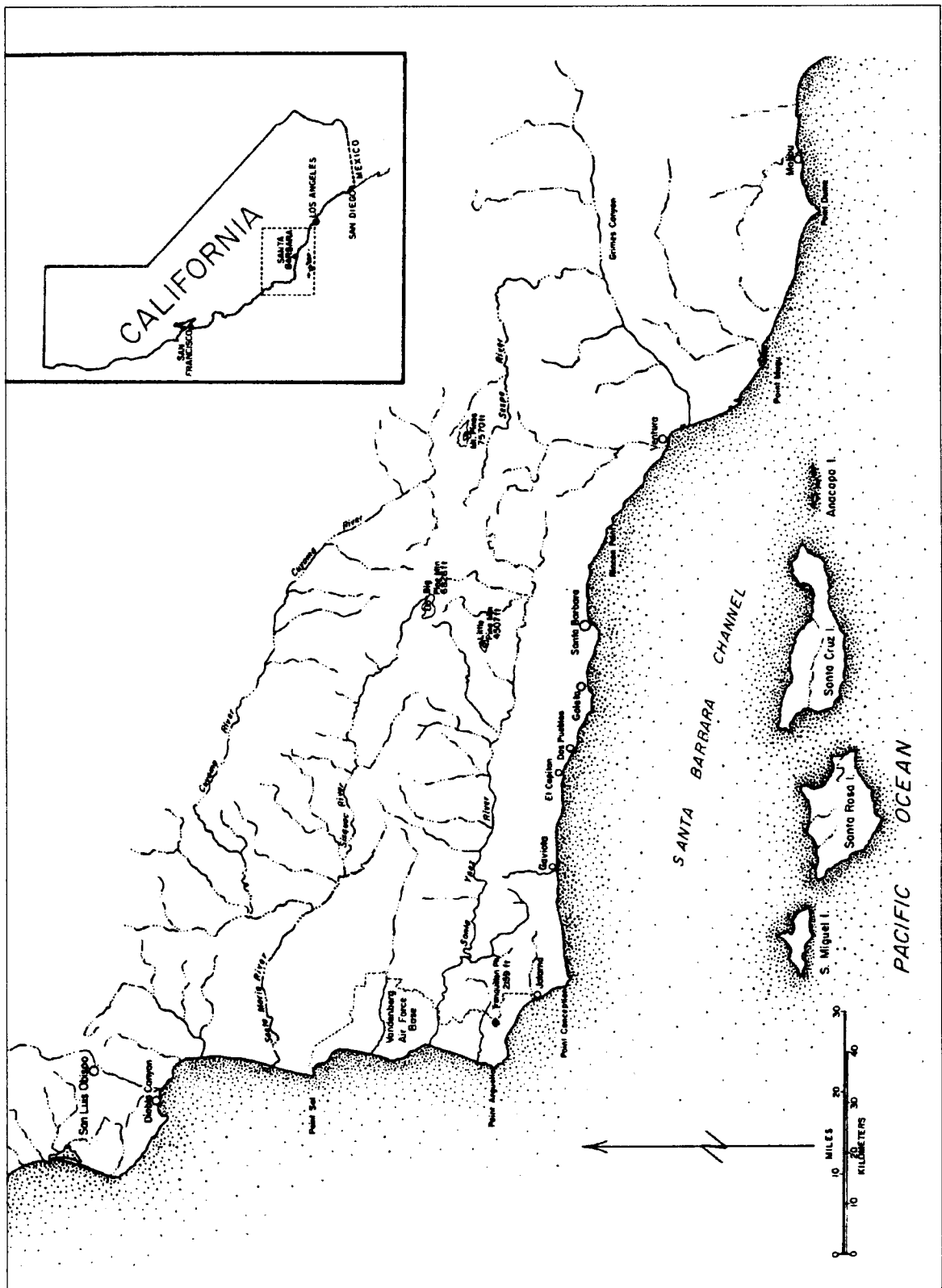


Figure 1. Channel Islands, California (From Arnold 1987)

Environment

The Channel Islands are a series of eight islands off the coast of southern California: Anacapa, Santa Cruz, Santa Rosa, San Miguel, Santa Barbara, San Nicolas, San Clemente, and Santa Catalina. The first four islands comprise the Northern Channel Islands, and along with Santa Barbara Island, they make up Channel Islands National Park.

The Northern Channel Islands are part of a 130-mile long mesozoic formation known as Anacapia, which is characterized by marine sedimentary and volcanic layers from the Late Cretaceous and Miocene ages.¹ This formation trends east-west and includes, in addition to the islands, the western part of the Santa Monica Mountains.² The islands are capped by Pleistocene terrace formations.³

The east-west direction of the Northern Channel Islands is roughly parallel to the east-west trend of the California coastline in this region. The islands delineate the southern boundary of the seventy-two-mile-long Santa Barbara Channel.

The eastern-most island in this chain is Anacapa Island, which is actually comprised of three islands extending for about five miles.⁴ The eastern end of Anacapa is a mere eleven miles from the mainland.

The next island to the west is Santa Cruz Island, the largest of the Northern Channel Islands. Santa Cruz is twenty miles south of the city of Santa Barbara. It is

about twenty-one miles long, has an average width of four miles, and an area of ninety-six square miles.⁵

Santa Rosa Island, the location of one of the three sites in this study, is the third island from the east (Figure 2). It has a total area of approximately eighty-four square miles, which makes it just slightly smaller than Santa Cruz Island.⁶ The surface of Santa Rosa is characterized by rugged terrain, with the highest point on the island, Soledad Peak, at 1,574 feet above sea level. The shoreline varies considerably, but is generally rugged. The Cluster Point Site, possibly the remains of *Dora Bluhm*, is scattered along and to the north of Cluster Point, which is on Santa Rosa's southwestern shore.

The western-most island in the Northern Channel Islands is San Miguel Island, the location of the remaining two sites in this study (Figure 3). San Miguel is about 7 1/2 miles long, averages 2 1/2 miles in width, and has an area of 14 square miles.⁷ The island's surface is barren, with considerably lower relief than Santa Rosa, the highest point only 831 feet above sea level. The shoreline, however, is just as rugged as its eastern neighbor. The Northwest Cove Site, possibly *J. M. Colman*, is located in Northwest Cove, Point Bennett. Point Bennett forms the western-most tip of the island. *Comet's* wreck site is located in Simonton Cove, on the northern shore of San Miguel Island.

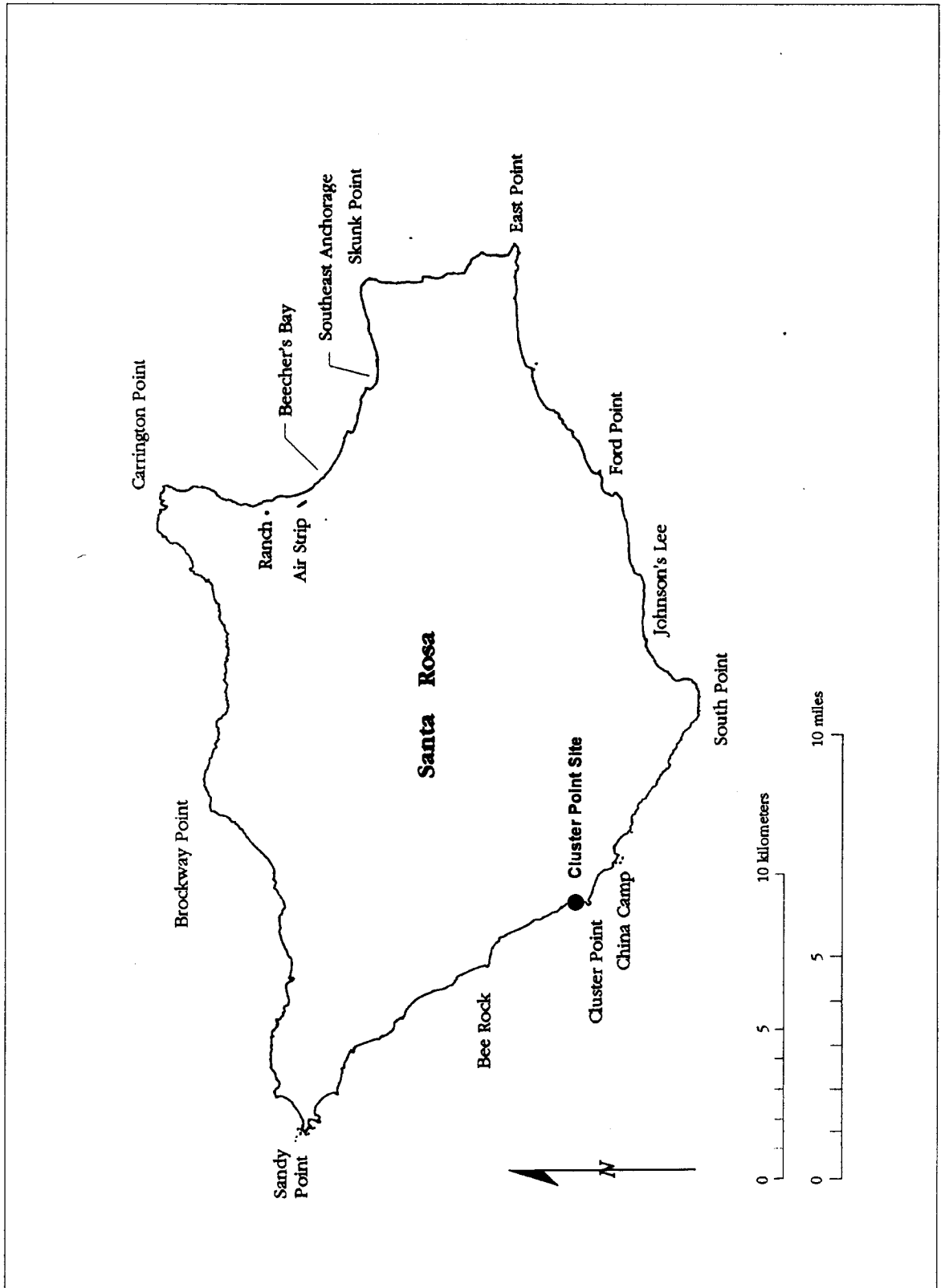


Figure 2. Santa Rosa Island

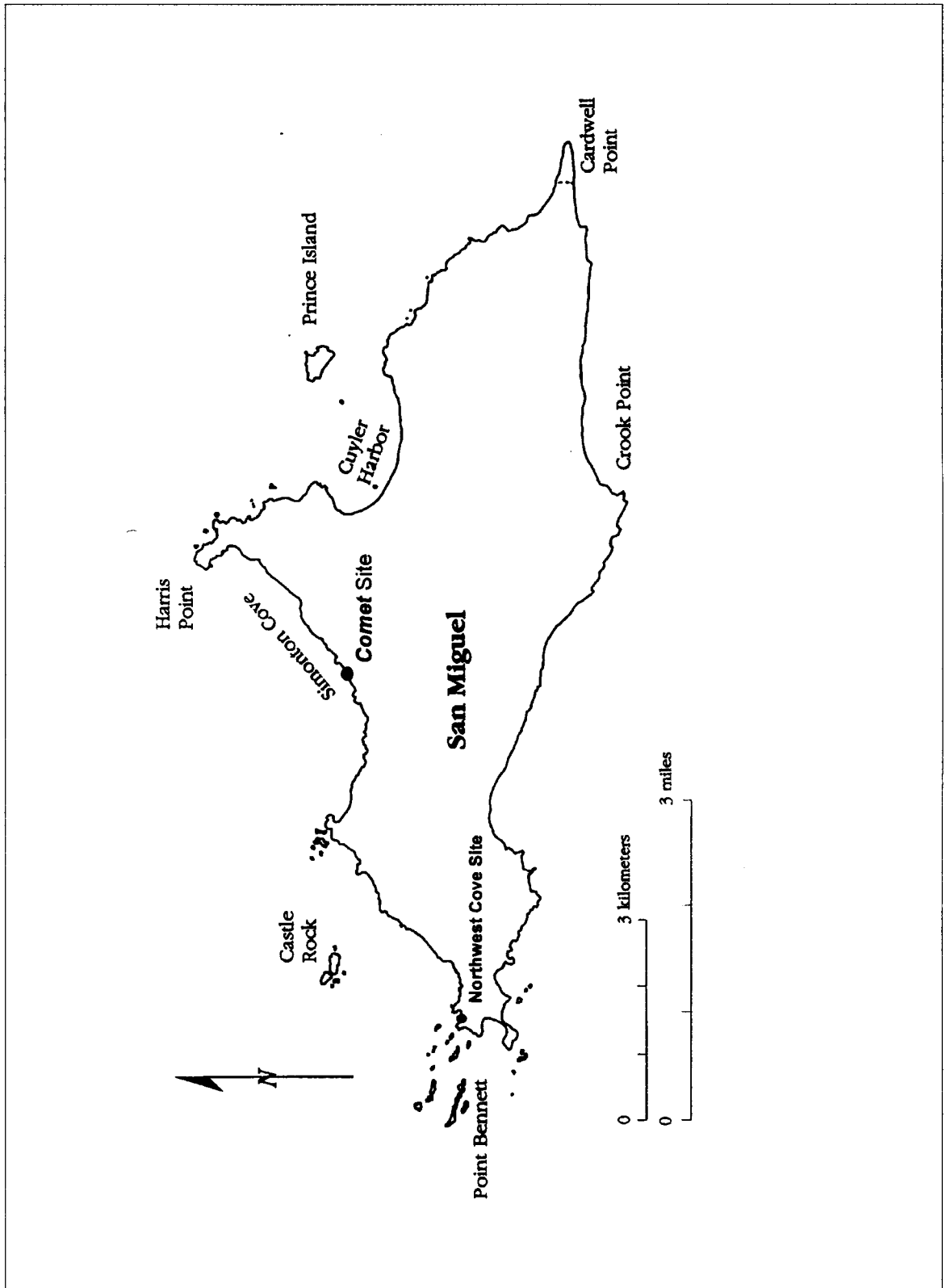


Figure 3. San Miguel Island

Regional Prehistory/History

The Northern Channel Islands and surrounding mainland regions have probably been occupied by humans for ten thousand years. Although the oldest firmly dated site on the islands is from 7500 years before present (B.P.), less reliable dates have been obtained from 10,000-12,000 B.P.⁸ The Channel Islands were inhabited from these early times by a subgroup of the Chumash people, the Island Chumash.⁹ The history of the Island Chumash has been divided into the Early Period (7500 B.P.-3400 B.P.), Middle Period (3400 B.P.-A.D. 1150), Late Period (A.D. 1150-1500), and Historic Period (A.D. 1500-1785).¹⁰ The Middle Period marks the beginning of the importance of marine resources in Chumash subsistence, which results in the shell middens that dominate island prehistoric archaeological sites. The Northern Channel Islands are dotted by thousands of prehistoric shell middens, including areas near both wreck sites on San Miguel Island.

The lives of the Island Chumash, like all Native Americans, changed drastically with the arrival of Europeans. The first European to visit the coast of California was the Portuguese sailor Juan Rodriguez Cabrillo, sailing under the Spanish flag in 1542. As Cabrillo passed up the coast, he noted the Channel Islands, and reportedly remarked on the excellent harbor at La Posesion (San Miguel Island).¹¹ This harbor supposedly

sheltered Cabrillo for the winter on his return voyage south, and, legend has it, he died there on February 3, 1543.

Although California was the subject of early Spanish exploration, and its shores were coasted twice a year for nearly two centuries by Manila galleons on their way to Mexico, it was not permanently settled until 1769. During Spanish rule (1769-1822), California was subject to Spain's laws forbidding foreign trade by its colonies, which limited trade, for the most part, to illicit activities.¹² The first trade of any note began in the early nineteenth century, and consisted of commodities such as hide, tallow, fur, and whaling products.¹³ With Mexican independence in 1822 came a slight relaxation of trade restrictions in California, but Monterey was named the only legal port-of-call on the coast, and tariffs were still so high that smuggling continued unabated.¹⁴

During the 1820s the limited hide and tallow trade became the most profitable trade on the California coast.¹⁵ Although the hide and tallow trade was clearly the most important commerce of the Santa Barbara region, the Channel Islands were noted for the extremely lucrative sea otter trade.¹⁶ Sea otter hunters frequented the islands into the American period, which began with the signing of the Treaty of Guadalupe-Hidalgo in 1848. By this time, however, the islands had been nearly depleted of sea otters.

With the discovery of gold in northern California in 1848, the entire Pacific coast of North America changed forever. The sparse maritime activity along the California coast increased dramatically. With this expansion in coastal maritime activity, the Santa Barbara region, and the Santa Barbara Channel especially, became a crossroads to coastal traffic. Passenger steamers, trans-oceanic merchantmen, and coastal traders plied the channel's waters on their way to and from various ports of call. Included were coastal lumber schooners which, when Santa Barbara was not their destination, traversed the channel to reach points south.

During the second half of the nineteenth century, the principal activities on and around the Channel Islands were ranching, sealing, and fishing. Ranching began on the islands during the late 1830s when Andres Castillero, who gained ownership of Santa Cruz Island with a Mexican land grant, introduced cattle. Shortly afterwards, a cattle ranch was also established on Santa Rosa Island. The 1850s saw ranching become the Northern Channel Island's economic mainstay. During this decade, Captain George Nidever introduced ranching to San Miguel Island when he built an adobe house and shipped herds of cattle, sheep, and horses to the island.¹⁷

Ranching remained the most important commercial interest on the islands throughout the rest of the

nineteenth and into the twentieth century. Indeed, although Santa Rosa Island is public land administered by the National Park Service, there is an active cattle ranch there to this day. Both Santa Cruz and Santa Rosa remained under private ownership tied to ranching interests until very recently. San Miguel Island, on the other hand, was never privately owned. As it was not under a Mexican land grant when California became part of the United States in 1848, San Miguel has always been the property of the United States government.¹⁸ The island passed through the hands of several parties who claimed ownership until the U.S. government granted the first official lease to William G. Waters in 1911.¹⁹ This lease was passed on to several more individuals until the U.S. Navy finally evicted the last residents and took over management of the island in 1948.²⁰ Throughout this time, ranching remained the primary commercial activity on the island.

Sealing and fishing were important local trades in the Santa Barbara region throughout the second half of the nineteenth century. Naturally, the Channel Islands were the focus of these activities. Although sealing was primarily a seaborne activity, base camps were established on the islands.²¹ Seal hunting remained a lucrative business until the first part of the twentieth century, and fishing is still an active industry today.

This brief synopsis of the history of the Santa Barbara

region, and especially the Channel Islands, makes it clear that the area has a long maritime tradition. From the plank canoes, or *tomols*, that the Island Chumash used to cross the channel, to the sail and steam vessels of the late nineteenth and early twentieth centuries, the people who lived in the area relied on the ocean for their livelihood.

NOTES

¹Donald W. Weaver, *Geology of the Northern Channel Islands* (American Association of Petroleum Geologists and Society of Economic Paleontologists & Mineralogists, 1969), 1.

²Ibid.

³Ibid.

⁴George Davidson, *Pacific Coast Pilot of California, Oregon, and Washington Territory* (Washington D.C.: Government Printing Office, 1869), 33.

⁵Weaver, *Geology of the Northern Channel Islands*, 9; Davidson, *Pacific Coast Pilot*, 34.

⁶Weaver, *Geology of the Northern Channel Islands*, 9.

⁷Davidson, *Pacific Coast Pilot*, 37; Weaver, *Geology of the Northern Channel Islands*, 10.

⁸Jeanne E. Arnold, *Craft Specialization in the Prehistoric Channel Islands, California*, University of California Publications in Anthropology, Vol. 18 (Los Angeles: University of California Press, 1987), 6.

⁹Ibid.

¹⁰Ibid., 6-8.

¹¹Ella A. Ludwig, *History of the Harbor District of Los Angeles* (Los Angeles: Historic Record Company, Inc., 1927), 75.

¹²Ibid., 174.

¹³Ibid., 176.

¹⁴Ibid., 187.

¹⁵Ibid., 194.

¹⁶William Henry Ellison, ed., *The Life and Adventures of George Nidever, 1802-1883* (Berkeley, CA: University of California Press, 1937; reprint, Santa Barbara, CA: McNally & Loftin, Publishers, 1984), i.

¹⁷Marla Daily, ed., *A Step Back In Time: Unpublished Channel Islands Diaries*, Occasional Paper Number 4 (Santa Barbara, CA: Santa Cruz Island Foundation, 1990.), 1.

¹⁸Ibid.

¹⁹Ibid.

²⁰Ibid., 2.

²¹Don Morris, *Shipwrecks and Mishaps at Channel Islands National Park* (Unpublished Manuscript, 1990), np.

CHAPTER II

THE PACIFIC COAST LUMBER TRADE

Most historians agree the Pacific coast lumber trade began in the late 1840s. Lumber was used and exported before this time, but in a quantity too small to be considered a sustained trade or industry. The Gold Rush sparked the American development of California: first with the Gold Rush cities of San Francisco, Sacramento, and Stockton; later with southern California's metropolitan areas. This development, in turn, led to the creation of lumber industries in Washington, Oregon, and northern California (Figure 4).

The Pacific coast lumber trade can be broken into three, equally important parts: logging the trees, milling the logs, and transporting the finished product to market.¹ West coast geography ensured that the latter step was carried out solely in ocean-going vessels. The Sierra and Rocky Mountains were natural barriers to overland trade, and there was no means of overland transportation before the completion of the transcontinental railroads in the 1880s.²

Because of Pacific coast environmental conditions, shippers quickly realized that they needed a distinctive vessel for lumber transportation. Through a combination of the shipbuilder's cultural background (transplanted from the

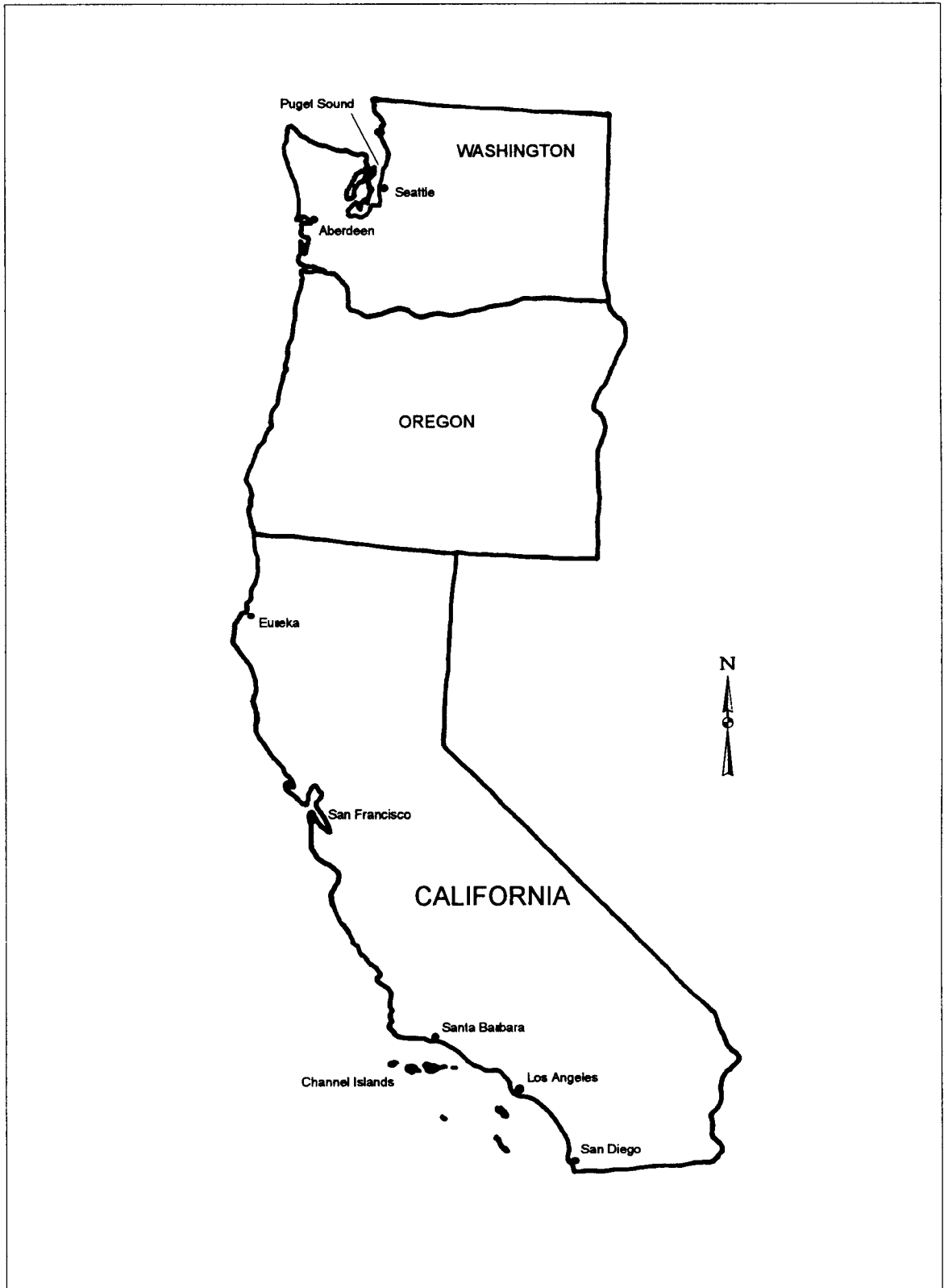


Figure 4. Pacific Coast

east coast), and the unique environmental circumstances that existed on the west coast, a vessel emerged that was specifically designed for hauling this commodity: the Pacific coast lumber schooner.

Though not as grand as a naval ship-of-the-line or as beautiful as a transoceanic clipper, the lumber schooner nevertheless carried the life blood of California development. It made possible everyday trade and therefore laid the foundation of virtually every metropolitan center in California. The regional historical importance of this vessel is unparalleled. This chapter will describe the lumber schooner's historical context by outlining the development of the lumber industry.

Ironically, in 1850, with the Pacific Northwest lumber industry in its infancy, it was cheaper to ship wood ten thousand miles from the east coast than obtain it from the relative closeness of the Pacific Northwest.³ The increased lumber demand of the Gold Rush, however, insured a boom in the west coast lumber industry by the end of that decade. The California lumber business received another boost during the 1880s with a sharp increase in southern California development. Further economic upswings occurred in the early twentieth century, especially after the San Francisco earthquake and fire in 1906.⁴ Although railroads came to the west during the 1880s, demand for coastwise and export lumber remained very high until after World War I.⁵

Economy of the lumber producing regions, especially Puget Sound, was dependent on its markets. One modern historian writes that "well into the twentieth-century, the fortunes of the Pacific Northwest and sunnier climes around the Pacific Rim were inextricably entwined."⁶ For example, a real estate boom in San Diego or New Zealand meant higher lumber prices in Puget Sound. A profitable lumber trade was important to everyone in the region, because from the beginning, life in the Pacific Northwest and northern California revolved around the lumber industry.

Historically, five periods are recognized in which logging occurred on the west coast.⁷ First, the prehistoric period, in which aboriginal inhabitants made limited use of the resource. Second, the early European period, when explorers utilized timber for ship repairs or temporary shelters before permanent settlement occurred. Third, colonization of the Spanish period, primarily during the latter part of the eighteenth century, when permanent settlements were built in California. Spanish-period wood use was also limited because Spaniards preferred adobe structures to wood.⁸ Spanish mission records indicate, however, that some redwood was harvested and used in building construction in San Francisco and Santa Barbara in the 1780s and 1790s.⁹ Also of note during this period was the Russian presence in California. Russians constructed Fort Ross and several small vessels on the northern

California coast in 1811, using the vast stands of redwood in the area and a water-powered mill.¹⁰

The fourth period of early California timber harvesting was the Mexican period. Though it is commonly believed that California economy during the Mexican period, 1822 to 1846, was based solely on hides and tallow, logging was also important.¹¹ There was little market for redwoods and other lumber, however, until the 1830s. At that time California increased in population with the establishment of private ranches.¹² Through the mid 1830s, most of lumber was hand-cut using sawpits; but in 1834, the first commercial water-powered mill was set up on the Russian River by Captain Cooper.¹³ This was followed in 1844 by the first steam-mill on the Pacific coast, established at Bodega Bay by Captain Stephen Smith.¹⁴ Smith, who had arrived in California from New England in 1840 on board the bark *George Henry*, found that much of the lumber used in California was imported from Hawaii. Smith sailed back to the east coast and returned in 1843 with steam machinery and established his mill. *George Henry* then began carrying lumber coastwise to San Francisco.¹⁵

As in California, logging in the Pacific Northwest also began much earlier than the Gold Rush. Dr. John McLoughlin constructed the first sawmill west of the Mississippi River for the Hudson's Bay Company in 1827.¹⁶ This mill was on the Columbia River, not far from Fort Vancouver, and quickly

began a regular trade in lumber to such markets as California, Hawaii, South America, and China, though its main market was the expanding areas of the Pacific Northwest itself.¹⁷ Michael T. Simmons and George W. Bush built a sawmill in Puget Sound as early as 1847, at Commencement Bay, near the southern end of the sound.¹⁸ This mill became the first to ship a cargo of lumber products from Puget Sound when it sent a cargo of shingles and piling to Hawaii via the Hudson's Bay Company in 1848. By 1849, merchant ships regularly called on Puget Sound settlements, bringing supplies from San Francisco and departing with lumber, hides, or fish.¹⁹ This led to the fifth and final period of west coast lumbering: the American period.

In 1849, when the lumber industry was still young, the west coast was a vast, untapped source of soft woods. Because Puget Sound was the only protected, natural ocean harbor between San Francisco and the Canadian border, it became the main source of lumber for the entire Pacific Basin. The magnificent timber stands of Washington Territory became legendary. John Hittell, commenting on Pacific coast industries in 1882, wrote the "fir and cedar forests of Washington . . . as sources of lumber for exportation . . . are unequaled."²⁰ A report from 1872 estimated that there were more than twenty million acres of timber in Washington Territory, consisting mostly of Douglas fir, hemlock, cedar, and spruce.²¹ Shipbuilding became one

important market for this wood, and, because it is particularly consequential to this study, it will be discussed in greater detail in Chapter III.

American timber exploitation began in earnest with the huge demand for lumber the California Gold Rush created. At the height of the Gold Rush, lumber which could be obtained in the Pacific Northwest for ten dollars per thousand board feet could be sold in San Francisco for five hundred dollars per thousand.²²

Settlements at Puget Sound were still relatively small in 1852. Virtually all these scattered communities grew up around sawmills, as this early industry was the sound's only economy. Puget Sound entered the industrial age in 1851 when Henry Yesler built the first steam sawmill at present-day Seattle.²³ That same year, a Swede named Nicholas Delin also constructed a steam mill near Tacoma "to engender . . . [a] neighborly rivalry which has since marked the existence of these two principal cities of Puget Sound."²⁴ Many early mills, both water- and steam-powered, could produce several thousand board feet of lumber per day.²⁵

One of Puget Sound's most well-known and long-lived lumber companies was the Puget Mill Company, founded by William Talbot and Andrew Pope in 1851.²⁶ Talbot had sailed from Maine to San Francisco in 1849, where he witnessed first-hand the demand for lumber. He formed a partnership with Pope, and sailed to Puget Sound to select a mill site.

The site chosen, Port Gamble, was in a deep, sheltered anchorage. The anchorage's qualities were necessary for a successful lumber mill, both to load out-going ships with wood, and to receive logs from Washington's interior waterways.²⁷ The Puget Mill Company, which produced its first lumber in 1853, quickly became the sound's largest mill company.²⁸

At the end of 1853, fourteen mills were in operation on Puget Sound, including steam-powered mills at Port Gamble, Port Ludlow, Appletree Cove, Alki, and Seattle. The population of the Puget Sound area had grown from fewer than one hundred in 1850 to approximately four thousand in 1853.²⁹ Some of these early mills were successful and operated for many years. The Fort Madison mill, for instance, owned by George A. Meigs, ran from 1853 until the early 1880s.³⁰ Several mills that opened in the 1850s, however, either shut down or eventually sold out to Pope and Talbot's expanding empire. For example, W.P. Sayward and J.R. Thorndike sold the mill at Port Ludlow, founded in 1853, to Pope and Talbot in 1874; and the Utsalady mill, opened in 1857 by Thomas Crannery and Lawrence Grennan, sold out to the Puget Mill Company in 1876.³¹

Another highly successful lumberman in this early period was William Renton. He began his career in the lumber business by opening the Port Orchard mill in 1853, but because it was not profitable, he sold it in 1862.³²

Renton opened another mill in 1864, this one at Port Blakely, which became one of the most successful mills on the sound.³³ Once again, the site for this mill was chosen for its deep, sheltered anchorage. When the mill began cutting in April 1864, it produced fifty thousand board feet of lumber per day.³⁴ At its peak in the early 1880s, the Port Blakely Mill Company employed 1,200 men and produced 400,000 board feet per day. Profits from the mill diminished after the death of Renton in 1891, and it closed in 1914.³⁵

Early on, Pacific Northwest sawmills relied on others to log their trees. Timber was purchased from independent loggers "who . . . [made] a business of logging, which includes the cutting of the trees, hauling them to the water's edge, throwing them in, and rafting them to the mill."³⁶ When trees directly adjacent to accessible waterways had been harvested, it became necessary to devise alternative means of moving trees to the mills. Skid roads became the most common method. These skid roads were lined with logs laid perpendicular to the path. The logs were greased and the felled trees dragged along them with oxen teams. Skid roads and oxen teams were used until the 1880s, when they were replaced by more modern methods. During this early period, loggers used axes to fell the trees, which was a time consuming process, and the mills used huge circular saws to cut the logs into planks.³⁷ Both of these

techniques were replaced with more efficient methods in the 1880s.

San Francisco was the west coast lumber trade's commercial center throughout the nineteenth century. Most Northwest mill operators had partners in San Francisco who marketed the final product and obtained capital for the mill.³⁸ Initially, most mill operators relied on independent shippers to haul lumber to market. This changed quickly, however, as mills greatly reduced overhead costs by purchasing their own fleets of lumber schooners. In 1862, the Puget Mill Company owned at least ten vessels; two decades later it owned a fleet of sixteen sailing vessels and four tugs.³⁹ The Port Blakely Mill Company acquired its first three vessels in 1866. Its fleet expanded rapidly, especially when the Hall Brothers, a well-known Puget Sound shipyard, moved to Port Blakely in 1880.⁴⁰

During the 1860s, a dramatic increase in both the population and the amount of timber being processed in the Pacific Northwest took place. Pope and Talbot added a second mill to their operations at Port Gamble in 1857, and in 1869, they tore down their original mill and built a larger, improved mill. The Puget Mill Company doubled its capacity, cutting more than 160,000 board feet per day.⁴¹ By 1870, the population of Washington was twenty-three thousand with forty-two sawmills in operation, most located on Puget Sound.⁴² The entire Puget Sound economy was

centered on the lumber trade, in turn ultimately oriented toward San Francisco. This is because the majority of the mills were owned by companies based in San Francisco. An 1872 Business Directory and Guide to Washington Territory noted that "along the entire length of the Sound are scattered towns containing from 100 to 300 inhabitants, in which no business but that of lumber is carried on These mills are owned principally by firms in San Francisco."⁴³ In addition, San Francisco acted as the area trans-shipment hub, collecting and dispersing lumber shipped from Puget Sound.

In the early 1880s, between 150 and 200 million board feet of lumber was shipped out of Puget Sound annually.⁴⁴ By 1880, the population of Washington had tripled over the previous decade to seventy-five thousand inhabitants.⁴⁵ During this year, Pope and Talbot, still Puget Sound's leading lumbermen, were able to produce 335,000 board feet per day with the addition of mills at Utsalady and Port Ludlow.⁴⁶

The 1880s ushered in a new era for the Pacific coast lumber industry. In addition to another huge leap in population and number of mills, several technological advances in logging and milling were introduced that significantly increased dressed lumber output. The changes were forced, however, as trees became more and more inaccessible. Two of the most important advances were the

steam donkey engine and the logging railroad. The donkey engine, a steam engine mounted vertically on a wooden sled, was first used successfully in logging trees by John Dolbeer of Eureka, California in August 1881.⁴⁷ The engine turned a flywheel attached to a cable which dragged logs to a central location after they were felled. Because the engine was mounted on a wooden sled, it was portable and could be used wherever necessary.

The second revolutionary change came with the introduction of the logging railroad, which replaced the skid road as a means of transporting logs to the mill. The first logging locomotive, which ran on a maple-wood track, was built in Marysville, Washington in 1883.⁴⁸ The small railroads allowed much greater access to larger trees located further into the forest. The logging railroad gave larger mill companies greater control of the industry and forced many smaller companies out of business, as only those companies with the necessary capital could afford to build railroads.⁴⁹

The logging railroad also had an effect on the independent loggers who supplied most mills with timber. As loggers sought higher prices for logs, some mills saw logging railroads as a means of keeping prices down by creating competition.⁵⁰ The logging railroads reduced the mill's reliance on independent loggers, but it by no means drove the independents out of business.⁵¹

Two additional technological advances introduced during the 1880s were the two-man crosscut saw and the band saw.⁵² The two-man crosscut saw replaced the ax as the principal tool used to fell trees. It was quicker and required less effort. The band saw replaced the circular saw in the mill, an innovation that increased a mill's daily output ten times.⁵³ The combination of the donkey engine, logging railroad, crosscut saw, and band saw led the lumber industry of the Pacific Northwest into a new era of productivity.

The first commercial lumber cargo shipped from Grays Harbor, the home of several major mills, was in 1881.⁵⁴ Hoquium, Aberdeen, Sylvia, and Cosmopolis, the main ports of Grays Harbor, rose in importance as shipping centers during the early 1880s. This was due in part to the lower price at which logs could be obtained by these mills. Because of easily accessible timber stands and the new technology, logs sold for \$4.50 to \$5.50 per thousand board feet in Grays Harbor, while mills in Puget Sound paid \$5.50 to \$7.00.⁵⁵ This price advantage led Pope and Talbot to acquire yet another mill, this one at Cosmopolis. Under Pope and Talbot management, this mill increased production from 30,000 board feet per day in 1881 to 600,000 board feet per day in 1888.⁵⁶

The improved lumber output was fueled by California demand, which increased markedly during the 1880s. The Santa Fe railroad's completion into Los Angeles in 1885 set

off a major boom in real estate development in southern California. Many companies anticipated this boom and set up lumberyards in the area before 1885. For example, in addition to its northern California lumberyards at Vallejo and Alameda, the Port Blakely Mill Company acquired new yards at Santa Barbara, San Buenaventura, and San Pedro during the mid 1880s.⁵⁷ Between 1883 and 1889, total shipments of lumber to California rose from 200 million board feet to 323 million board feet annually.⁵⁸

The two main harbors in the Los Angeles area at this time were Santa Monica and Wilmington (which later became San Pedro). These were not ideal ports, however. In 1882, John Hittell wrote in his publication *The Commerce and Industries of the Pacific Coast of North America* that "Santa Monica has a wharf accessible for large vessels with abundant room and deep water; but the anchorage is not secure in stormy weather. All the steamers and nearly all the sailing vessels go to Wilmington. . . ."⁵⁹ The problem with Wilmington, however, was that it was too shallow to be navigable at low tide. Therefore, all cargo had to be lightered ashore, which increased costs.⁶⁰ Harbor improvements began at Wilmington in 1871, but a universally accessible port was not finished until the 1890s, at which time San Pedro became Los Angeles's chief port.⁶¹ The end of the 1880s marked the end of the real estate boom, and lumber demand from southern California decreased

significantly until another boom in the first part of the twentieth century. During the second decade of the twentieth century California received an average of one billion board feet of lumber annually from the Pacific Northwest. California remained a steady market for lumber until the decline of coastwise shipping after World War I.⁶²

In addition to California, several other coastal markets opened for Pacific Northwest lumber in the 1880s. The end of the War of the Pacific in 1881 encouraged the victor, Chile, to embark on a program of railroad construction that lasted throughout the decade.⁶³ Limited development also occurred in Peru and Mexico during the 1880s and 1890s, which created further markets.

On Puget Sound, the coming of the Northern Pacific Railroad to Tacoma in 1883 signalled another economic tremor.⁶⁴ This railroad was extended northward from the Columbia River, and Tacoma became its first seaport connection. The railroad had several effects on the Pacific Northwest lumber industry, both positive and negative. On the positive side, it opened markets in the east to Puget Sound's forest products.⁶⁵ It also allowed cheaper access to the Pacific Northwest region, and therefore encouraged settlement, which led to increases in local markets as the population rose.⁶⁶ Finally, construction of the transcontinental railroad, coupled with an increase in

railroad construction around the Pacific Rim, provided a relatively large and stable market for Pacific Northwest lumber in the form of railroad ties.⁶⁷

On the negative side, completion of the railroads led to creation of a new type of competition for Puget Sound mills. Before the railroads, only two types of mills existed: cargo mills, which relied on seaborne trade; and small, interior mills that served a local market.⁶⁸ The new "rail mill," which relied on the railroad to transport its product to markets in the east, significantly affected the operation of cargo mills, many of which were forced to close as a result of the competition.⁶⁹

The railroads allowed a vast increase in the amount of lumber cut in the Pacific Northwest: in 1890, Washington cut more than one billion board feet of timber; in 1895, two billion board feet; and three billion in 1902.⁷⁰ In the early twentieth century, many smaller mills around Puget Sound closed due to high technological costs. Railroads and modern, mass production mill machinery required a tremendous capital outlay.⁷¹ Although railroad competition affected ocean-going trade, shipping lumber by sea still dominated the coastal and overseas markets into the twentieth century. Nonetheless, midway through the first decade of this century, total lumber shipped by rail passed its seaborne competition, which signalled the inevitable end of the Pacific coast lumber schooner.⁷²

California was the second most important lumber-producing region on the west coast, behind the Pacific Northwest. The redwood forest around Humboldt Bay was one of the world's densest, and the Sierra Mountains contained thick coniferous growth, including sugar pine, western yellow pine, and white fir.⁷³ With the exception of San Francisco Bay, California was devoid of good, natural ocean harbors, though the bays at San Diego and Humboldt did offer limited protection. Far more common, however, were small, unprotected anchorages known as "dogholes" that came to characterize coastal California shipping north of San Francisco. Dogholes were an appropriate euphemism which compared the way small vessels had to maneuver into position to receive a cargo to "a dog settling into its hole."⁷⁴

Before the 1849 Gold Rush coastwise shipping was rare in California. Before 1847, only two vessels, the American brig *Henry* and the British brig *Janet*, traded between the Columbia River and San Francisco.⁷⁵ The coastal trade increased rapidly after 1849. Exploitation of the vast timber stands of Humboldt Bay began in that year, and the first sawmill appeared the next.⁷⁶ Humboldt Bay's first commercially successful mill was started by Ryan, Duff and Company in 1852, when they purposely ran their steamship *Santa Clara* aground and scavenged its parts to construct a steam-powered mill.⁷⁷ The redwood forests along the Mendocino coast did not escape the attention of lumbermen

for long, as Henry Meiggs began the California Lumber Company and opened a mill at Big River (now Mendocino City) in 1852.⁷⁸

As the more sheltered regions of the coast became occupied, a new type of mill developed. This class of mill grew to characterize the northern California coastal trade. These mills were small and often situated in dogholes. Due to anchorage size and dangerous conditions, they were primarily frequented by small, two-masted lumber schooners until well into the 1880s, by which time, three- and four-masters had taken over elsewhere.⁷⁹ The schooner's masters had to bring their vessels in as close to the breakers as possible, and had to be able to break-off loading abruptly should weather turn ugly.⁸⁰ In such conditions, traditional docking and loading methods were useless, and new methods, such as the apron chute, were devised. Ralph W. Andrews, in his book *Redwood Classic*, described the use of the apron chute.

This chute extended some eighty feet down and out over the rocks, the whole spidery contraption supported by a trestle and a type of A-frame. The apron or thirty-foot extreme lower section was suspended by a cable from the A-frame and swayed in the perpetual wind like a grasshopper's antennae. . . . When one of the little . . . lumber schooners was ready to chance an entrance to the channel between the rocks, she would signal ashore and prepare for the ordeal. This might take a few hours or a few days, depending on the weather and tide. . . . Once into the hole, anchors would be dropped fore and aft and the ship winched either way to settle her as near the bottom end of the chute as possible.⁸¹

When this process was complete, a feeder sent lumber down the greased chute. Lumber was released onto the schooner one piece at a time by dropping the hinged apron at the chute's end. This was done until the vessel was full, a process which could take days.⁸²

A later method was use of a wire cable stretched down from the bluff and anchored in the bay. When vessels came in to load lumber, they would position themselves under the lower end of the cable, and the cargo would be lowered down on slings.⁸³ Both these loading methods were exclusive to the coast of northern California (although also used to load sugar in Hawaii), where the less than perfect conditions precluded traditional techniques.

These small mill ports began to decline in the late 1890s and early 1900s as timber stands were cut back to such distances that it was not profitable to bring logs to the coastal mills.⁸⁴ At the same time, rail competition drove many of these coastal mills out of business, and they all but disappeared from the scene.

If dogholes characterized northern California mill ports, then mills built on bar harbors became synonymous with the Oregon coast. These anchorages, though better protected than their counterparts in California, often had treacherous sand bars at their mouths. As was the case in California, lumbermen who lacked capital to compete for better locales or who arrived after more favorable sites had

disappeared were forced to make do with what remained.⁸⁵ Consequently, bar harbor mills flourished on the coast of Oregon. One method that evolved for circumnavigating this problem was the use of steam tugs. Mills in the harbors often employed steam tugs to tow vessels over the bars to load lumber. Decline of the Oregon bar harbor mills parallels decline of the northern California dogholes, for very much the same reasons.

Although the lumber industry is still the mainstay of the Pacific Northwest economy, the historical period of lumbering which utilized sailing schooners as a means of transport ended after World War I. At this time, transportation needs not fulfilled by railroads were taken over by steel-hulled, steam-powered vessels. From the 1870s onward, however, transportation of lumber along the coast relied solely on ships specially designed for the lumber trade. These vessels, the two-, three-, and four-masted coastal lumber schooners, were designed to reflect the particular needs of the Pacific coast lumber trade, and came to dominate it.

NOTES

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³Henry Hall, *Report on the Shipbuilding Industry of the United States* (Washington D.C.: Government Printing Office, 1884), 131.

⁴Roger Olmsted, *C.A. Thayer & the Pacific Lumber Schooners* (San Francisco: Ward Ritchie Press, 1972), 4.

⁵Robert W. Vinnedge, *The Pacific Northwest Lumber Industry and its Development* (New Haven, Conn.: Yale University, School of Forestry, 1923), 11.

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¹³Clar, *Harvesting and Use of Lumber*, 12.

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¹⁶Thomas R. Cox, *Mills and Markets: A History of the Pacific Coast Lumber Industry to 1900* (Seattle: University of Washington Press, 1974), 9.

¹⁷*Ibid.*, 10.

¹⁸Murray Morgan, *Puget's Sound: A Narrative of Early Tacoma and the Southern Sound* (Seattle: University of Washington Press, 1977), 77; Ellis Lucia, *Head Rig: Story of the West Coast Lumber Industry* (Portland, OR: Overland West Press, 1965), 17.

¹⁹Joe Williamson and Jim Gibbs, *Maritime Memories of Puget Sound* (Seattle: Superior Publishing Co., 1976), 54.

²⁰John S. Hittell, *The Commerce and Industries of the Pacific Coast of North America* (San Francisco: A.L. Bancroft & Co., 1882), 35.

²¹*Business Directory, and Guide to Washington Territory* (Olympia, WA: Murphy & Harned, 1872), 2.

²²McNairn and MacMullen, *Ships of the Redwood Coast*, 12. A board foot is 144 cubic inches of lumber. A 1" X 12" X 12" piece is one board foot.

²³Lucia, *Head Rig*, 19; Newell and Williamson, *Pacific Lumber Ships*, 19.

²⁴Vinnedge, *Pacific Northwest Lumber Industry*, 8.

²⁵Daniel Jack Chasan, *The Water Link: A History of Puget Sound as a Resource* (Seattle: Puget Sound Books, 1981), 5.

²⁶Newell and Williamson, *Pacific Lumber Ships*, 18.

²⁷Chasan, *The Water Link*, 1-3.

²⁸For a complete history of Pope and Talbot, see Edwin T. Coman Jr. and Helen M. Gibbs, *Time, Tide, and Timber: A Century of Pope & Talbot* (New York: Greenwood Press, 1968).

²⁹Hittell, *Commerce and Industries*, 35.

³⁰Williamson and Gibbs, *Maritime Memories*, 65.

³¹*Ibid.*, 69.

³²*Ibid.*, 68.

³³Ibid.

³⁴Robert A. Weinstein, *Tall Ships on Puget Sound: The Marine Photographs of Wilhelm Hester* (Seattle: University of Washington Press, 1978), 43.

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³⁶Hittell, *Commerce and Industries*, 583.

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³⁸DeLong, *Pacific Schooner Wawona*, 39.

³⁹Cox, *Mills and Markets*, 116.

⁴⁰Ibid., 121.

⁴¹Ibid., 116.

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⁴³*Business Directory and Guide to Washington Territory*, 1872.

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⁴⁵Hittell, *Commerce and Industries*, 35.

⁴⁶Cox, *Mills and Markets*, 116.

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⁴⁸Williamson and Gibbs, *Maritime Memories*, 64.

⁴⁹Chasan, *The Water Link*, 19.

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⁵³Ibid.

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⁶⁴Chasan, *The Water Link*, 15.

⁶⁵Cox, *Mills and Markets*, 200.

⁶⁶*Ibid.*, 206.

⁶⁷*Ibid.*, 225.

⁶⁸*Ibid.*, 207.

⁶⁹*Ibid.*

⁷⁰Johansen and Gates, *Empire of the Columbia*, 389.

⁷¹Newell and Williamson, *Pacific Lumber Ships*, 142.

⁷²*Ibid.*, 112.

⁷³Mears, *Maritime Trade*, 61.

⁷⁴Wallace E. Martin, ed., *Sail & Steam on the Northern California Coast, 1850-1900* (San Francisco: National Maritime Museum Association, 1983), 51.

⁷⁵McNairn and MacMullen, *Ships of the Redwood Coast*, 11.

⁷⁶Cox, *Mills and Markets*, 63.

⁷⁷Ibid., 65.

4. ⁷⁸McNairn and MacMullen, *Ships of the Redwood Coast*,

⁷⁹Ibid.

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⁸²Ibid.

25. ⁸³McNairn and MacMullen, *Ships of the Redwood Coast*,

⁸⁴Newell and Williamson, *Pacific Lumber Ships*, 144.

⁸⁵Cox, *Mills and Markets*, 164.

CHAPTER III

THE PACIFIC COAST LUMBER SCHOONER

The schooner-rigged vessel proved best suited for the Pacific coast lumber trade in the second half of the nineteenth century. This ship type, with fore-and-aft rigging and two or more masts, developed as a distinct American design in the early eighteenth century.¹ The first mention of the term "schooner" comes from American colonial records. During this period, schooners were fitted with at least one square topsail, and were known as "topsail schooners."² By the turn of the nineteenth century, however, this topsail was largely abandoned in the United States and a pure fore-and-aft rig became prominent.³ By 1800, most vessels involved in the American coastal trade were schooners because of the sailing advantages offered by this type of rig in prevailing and offshore winds.⁴ The fore-and-aft-rigged vessel had three major advantages over the traditional ship rig: it could sail much closer to the wind, could more easily maneuver into harbors and rivers, and required a much smaller crew.⁵ The attributes that led to its adoption gave schooners nearly two centuries of popularity, lasting to the last days of sail.⁶

In the eighteenth century, east coast schooners were small vessels, carrying two masts and ranging from forty to

fifty tons. During the mid nineteenth century, however, they grew considerably: two-masters ranged from 100 to 250 tons, and three-masters ranged from 300 to 750 tons.⁷ The shift to three-masted schooners on the east coast began around 1850, and by the mid 1860s they were the most common vessels in the coastal trade.⁸ The increase in the number of masts was an effort to reduce individual sail size so that smaller crews could handle them, while at the same time increasing the total canvas spread necessary for larger hulls and greater speed.⁹ During the 1870s, east coast three-masted schooners increased in size, growing from an average 500 tons to an average 920 tons.

In the 1884 *Report on the Shipbuilding Industry of the United States*, Henry Hall (the author, not the shipbuilder), who spent several years visiting shipyards in every region of the United States, noted that schooner hulls were just as strong as those of any other ship of their size, as "they are constructed with a view to class A1 on the books of the American Shipbuilders Association, and no large ship can do better than that."¹⁰ The steam donkey engine became popular during this decade, as well, and was used for hoisting the sails and anchors, and running the windlass and pumps, further reducing the need for manpower.¹¹

West coast schooners, especially lumber schooners, had a different configuration than those on the east coast. West coast schooners had full poops and raised topgallant

forecastles.¹² In addition, west coast schooners often omitted separate topmasts, leaving one-piece, tall masts.¹³ Employing a leg-o-mutton (triangular) sail on the aftermost mast was also a popular west coast innovation.¹⁴

During the Pacific coast lumber trade's early years, virtually anything that floated was used to haul lumber to San Francisco, from scows and rafts to old square-rigged ships.¹⁵ As the industry grew, however, it became evident that the lumber trade needed specially suited vessels, and by the mid 1870s, the west coast lumber schooner became fully developed.¹⁶

The sailing qualities of schooner-rigged vessels were appropriate to beat up the west coast against the prevailing northwesterly winds. Early lumber schooners were small, two-masted vessels with a cargo capacity between 75,000 and 150,000 board feet of lumber (BF). Larger, three-masted schooners became dominant during the 1870s.¹⁷ Three-masters had a maximum capacity of approximately 500,000 to 600,000 BF.¹⁸ Finally, in the late 1880s, four-masted schooners, which could carry 650,000 to 1,200,000 BF, became common.¹⁹

Lumber schooner construction was tailored to the trade's specific requirements, and reflected a design that was, above all, economically viable. The Pacific coast lumber schooner needed to be loaded quickly; carry this heavy, cumbersome cargo to its destination; discharge it quickly; and return empty, without ballast.²⁰ On these

short trips, it was not economically feasible to load ballast for each return voyage and discharge it before loading lumber for the next trip. Rapidly increasing demand and expanding markets put a high value on speed.

The design that eventually became standard for west coast lumber schooners was a single-decked vessel (giving it only one large hold) that had a broad beam, long bow, square or elliptical stern, and oversized hatches to allow quick and efficient lumber stowage.²¹ In addition, they were sometimes fitted with bow or stern ports that allowed easier access to the hold and quicker loading.²²

West coast vessels had shallow drafts and flat bottoms for two reasons. First, shallow draft resulted in a reduced distance between the keel and the deck, which assured satisfactory structural strength.²³ Most ocean-going ships had two decks to ensure adequate longitudinal strength. Second, shallow draft and flat bottoms allowed schooners to visit sawmills located in shallow coves and harbors, often obstructed by sand bars.

Flat bottomed schooners were sometimes fitted with retractable centerboards to help counteract leeward drift.²⁴ The centerboard was retractable so it could be raised when the vessel crossed a sandbar or entered shallow water. Centerboards were common on Great Lakes schooners, but not much has been written about west coast centerboard construction. Historian Thomas Cox has stipulated that the

practice was limited mostly to small schooners servicing northern California dogholes and Oregon's bar harbors, where shallow draft was especially crucial.²⁵ Evidence based on Hall Brothers' vessels supports this assumption. Of 108 vessels built by the Hall Brothers Shipyard during their twenty-nine years as one of the leading shipyards on the Pacific coast, only twenty vessels, most two- and three-masted schooners in the two hundred to three hundred-ton range, were built with centerboards.²⁶ The largest centerboard schooner constructed by the Hall Brothers was *Comet*, which registered 429 tons.

Great Lakes centerboard use gives additional details about this device. By the mid nineteenth century, all centerboards operated on a single pivot on the forward edge, as opposed to rising straight up into the centerboard trunk. There were two possibilities in the centerboard placement: through the keel or alongside the keel.²⁷ During the mid nineteenth century, Great Lakes builders preferred the offset centerboard, primarily because it offered convenience in stepping the mast.²⁸ In 1866 the Board of Lake Underwriters, however, adopted a resolution that required through-keel centerboards in all vessels.²⁹ Henry N. Barkhausen notes that this probably reflected a change that had already taken place, as it led to stronger, better quality vessels.³⁰ At this point, it is not known whether west coast builders followed the same policy, although it is

likely.

Some features that provided longitudinal strength in Pacific coast lumber schooner hulls were large, built-up keelsons; bilge stringers added to the ceiling; and use of thickened ceiling planking to the turn of the bilge.³¹ The keelson was bolted through the floors into the keel. Rider keelsons were then bolted directly onto the main keelson. There could be up to four riders. Sister keelsons were placed on both sides of the main keelson, butted up to it, and bolted into the floors and horizontally edge-bolted into the main keelson. Finally, a number of assistant keelsons were placed on top of the sister keelsons, and bolted to the sister and edge-bolted to the riders.³²

The vessels were generally built entirely of Douglas fir, with the exception of the stem post, stern post, and rudder post, which were of more durable laurel and white oak.³³ Cabins were generally white cedar, pine, or redwood.³⁴ Schooners were typically double framed, fastened with both iron spikes and wooden treenails. Treenails were brought from the east coast, and made from durable and flexible eastern locust or oak.³⁵ Boring the holes and driving in the treenails was done by hand.³⁶

Along with a distinct hull design, west coast lumber schooners also had a unique schooner rig. Known as "baldheaded" schooners, they often carried only their gaff sails, preferring to run without topsails because "in the

long beat to windward of the return trip there were no gafftopsails to shift when tacking."³⁷ Many lumber schooners were "terns," or three-masted vessels with masts of equal height.³⁸ Some schooners were also outfitted with a yard on the foremast to carry a square sail, known as a hermaphrodite rig. This sail, however, was furled into the mast, like a drapery, rather than up to the yard.³⁹ This allowed furling the sail from the deck, so the vessel did not need more sailors than a regularly-rigged schooner, although carrying more sail. Some west coast lumber schooners set a leg-of-mutton sail on the aftermost mast instead of a gaff sail, depending on the personal preference of the master.⁴⁰

A typical west coast lumber schooner carried a crew of eight or nine, including the captain. In the case of the lumber schooner *C. A. Thayer*, the crew consisted of four seamen, two mates, a cook and the captain.⁴¹ Many lumber schooners, including *C. A. Thayer*, were equipped with donkey engines to assist in raising the sails, turning the capstan and windlass, and working the pumps. If the vessel was not equipped with a steam donkey, the crew would be slightly larger. Crew duties included handling lines, raising and lowering sails, and handling cargo.⁴²

For his work, the sailor received pay and provisions. The Shipping Articles for 1900 listed a mate's pay at fifty-five dollars per month, the second mate and cook's pay at

fifty dollars per month, and the seaman's pay at forty dollars per month.⁴³ The captain's salary began at one hundred dollars per month, plus a share in the profits of each voyage if he had purchased interest in the vessel.⁴⁴

The crew's quarters aboard a lumber schooner were small and spartan, consisting of a six-by-eight-foot cabin forward of the galley, containing bunks for six.⁴⁵ The captain's quarters, located near the stern, were considerably roomier and often richly furnished.

Lumber schooners were considered to be owned by a single company, although vessels were often jointly owned by sixteen or more individuals.⁴⁶ Shares in these vessels might be divided into as little as 1/64s. It was also common for the yard that built the schooner to retain a share of the ownership.

Loading and discharging lumber from a schooner was a time-consuming process. The larger mill ports employed stevedores, while at others, loading and unloading was the duty of the crew. If the crew was required to do the work, they were typically paid more while in port than at sea. For example, on a 1904 voyage to Honolulu, seamen aboard *C. A. Thayer* were paid thirty-five dollars per month while at sea, and forty dollars per month while in port.⁴⁷ Even with professional stevedores loading the lumber, however, it was a long process: it took an average of ten days to load a vessel, plank by plank.⁴⁸ Loading was accomplished using a

series of ramps that sloped up from the wharf to the stern, and then down into the hold. If the vessel was equipped with bow or stern loading ports, the ramps were sloped up to these.⁴⁹ After the hold was full and the cargo secure, the rest of the load was piled onto the deck and tightened down with chain and turnbuckles. Deckloads often represented more than half the cargo, and resulted in a twelve to fourteen-foot stack of lumber.⁵⁰ With deckloads that high, very little freeboard was left, and oftentimes the decks were awash. For a voyage to be profitable, however, such deckloads were required, and were possible because of the cargo's buoyancy.⁵¹

After 1881, stevedores used a vessel's donkey engine to assist in loading, or if the vessel did not have one, they used an engine on a floating barge brought to the vessel's side.⁵² In large harbors such as Puget Sound and Humboldt Bay, once a lumber schooner was loaded, a tug boat towed it out of the harbor, and sent it on its way.

Pacific Coast Shipbuilding

At the time of the California Gold Rush, no shipbuilding industry existed on the Pacific coast. Virtually all west coast sailing vessels were built in the east and brought around the horn to California. Henry Hall, commenting on the early lack of a lumber industry, noted that the "shipbuilding industry would have sprung up quickly

in California after the discovery of gold if there had been any timber available . . . but lumber had to be brought from the eastern states. . . ." ⁵³ Increased population, and therefore, increased demand for goods, however, resulted in a dramatic increase in shipbuilding activities in the aftermath of the Gold Rush, beginning in the mid 1850s. Shipyards began to appear along the coast, especially in northern California and Puget Sound where timber was readily available from new mills. These yards produced myriad small vessels, the majority of which were schooners for the coastal trade. Examples of these early, local builders include Thomas Coupe, who built several small schooners in the Puget Sound area in 1852, and John North of San Francisco, who built the three-masted schooner *Susan and Kate Deming* in 1854. ⁵⁴ Pacific coast shipbuilding as an industry, however, did not emerge until the late 1850s.

According to Henry Hall, the first vessel "of any size" built in Puget Sound was the sixty-ton *General Harney*, a schooner constructed at Whatcom in 1859. ⁵⁵ By 1860, only six vessels over one hundred tons had been built on the west coast, but the numbers increased dramatically during the following decades. ⁵⁶

In 1874, the Board of Marine Underwriters published a report written by Casper T. Hopkins after his 1867 visit to Puget Sound. Hopkins reported the advantages of building large, ocean-going vessels on the Pacific coast, based on

the quality, availability, and cost of materials. In this report Hopkins also noted the quality of coastal vessels built on the west coast during the late 1850s and early 1860s:

No finer fleet of schooners is owned by any American port than has been constructed here [San Francisco], and at our northern coast ports [Puget Sound]. [U]p to ten years ago, our schooners were in a condition similar to that of our ships and barks now, i.e., they consisted wholly of vessels built elsewhere, and not sent to the Pacific until age had made them cheap enough to meet the views of California purchasers. But within the last decade, several hundred small vessels have been built on this coast, of such model, material, strength, durability and sailing qualities, as have set completely at rest all doubts as to our capacity to build sailing vessels of any class in competition with any other American port.⁵⁷

Clearly the focus of shipbuilding activities during the 1860s was still on the small coastal trader, but it did not take long for shipbuilders to set their sights on larger vessels that would bring higher profit margins with each voyage, which holds especially true in a lucrative commerce such as the lumber trade.

Schooners built for the Pacific coast lumber trade up to the mid 1870s had generally ranged in size from 100 to 300 tons, with the majority in the 100 to 200-ton range. At Humboldt Bay, the second most important shipbuilding region on the Pacific coast behind Puget Sound, in a three-year period, 1874-76, thirty-one schooners totalling 4059 tons were built, an average of just over 130 tons per vessel.⁵⁸ According to one source, the first three-masted schooner

registering larger than three hundred tons, *Sunshine*, was built on the Pacific coast in 1875.⁵⁹ Larger hulls soon became the trend, as most lumber schooners built in the late 1870s and early 1880s approached three hundred tons in size. Henry Hall noted in 1884 that "latterly the vessels built at Humboldt have been schooners of 250 and 300 tons register. . . ."⁶⁰ An important "first" was achieved in 1882 when the Hall Brothers of Port Blakely constructed *William Renton*, the first three-masted schooner on the Pacific coast registering more than four hundred tons.⁶¹

Four-masted schooners built on the Pacific coast for the lumber trade did not make an appearance until the late 1880s. The first four-master constructed on the west coast was a converted barge of 344 tons, *Victoria*, built in San Francisco in 1864.⁶² The next four-masted schooners were not built until the late 1880s, when they became an important addition to the lumber trade.⁶³ A total of 130 four-masted schooners were built on the Pacific coast between 1864 and 1904, most registering between 550 and 750 tons.⁶⁴ Five-masted schooners, huge vessels generally registering more than one thousand tons, did not play a significant role in the coastal lumber trade. The first "proper" Pacific coast-built five-masted schooner was *Inca*, built by the Hall Brothers in 1896, registering 1014 tons. Only nine five-masters were constructed between 1888 and 1916⁶⁵

As one writer noted in 1882, the "fir and cedar forests of Washington . . . are the largest and most valuable bodies of timber for shipbuilding and spars on the globe. . . ." ⁶⁶ With Washington's virtually unlimited timber supply, it is no surprise that Puget Sound became the Pacific coast's premiere shipbuilding region. The *Business Directory and Guide to Washington Territory*, published in 1872, noted that

ship-building is carried on extensively, and no country in the world offers greater facilities for this branch of business than that adjoining Puget Sound. The lumber for building is convenient; labor and stores are comparatively cheap; the harbors are deep and commodious so that there is no trouble in launching a vessel; and finally, there is no ship timber on the globe superior to that which grows in the Territory. ⁶⁷

In addition to being convenient, Puget Sound's abundant timber made shipbuilding material cheap. ⁶⁸ A hypothetical cost comparison between building a three-masted ship in Bath, Maine versus Puget Sound, conducted by Hopkins in his 1874 publication, showed the difference to be astronomical. Hopkins found the price for materials in Bath, including masts and yards, would be \$39,305, compared to \$14,997 for the same materials in Puget Sound. ⁶⁹ On the west coast, milled lumber ready for shipbuilding could be purchased for ten to twenty dollars per thousand board feet, whereas on the east coast it cost between forty and sixty-five dollars. ⁷⁰

The chief timber of the region was, and remains, Douglas fir (*Pseudotsuga menziesii*), known as yellow fir in

the nineteenth century. Douglas fir proved to be an ideal wood for shipbuilding, and was endorsed by the San Francisco Board of Marine Underwriters in 1875 as an accepted shipbuilding material.⁷¹ Both Hall and Hopkins sang the praises of Douglas fir. One of the greatest selling points was the length of timber that could be obtained for shipbuilding. Hall notes that trees on the west coast grew from 150 to 300 feet high, so that "keel and keelson pieces and plank could be obtained of any length, and a vessel could be built with a far less number of butts and joints than in any other part of the United States."⁷² To this Hopkins added:

It is needless to remark that the great length of our lumber saves labor and fastening in scarphs and butts, gives greater elasticity to the ship's hull, and diminishes the danger of springing a leak. Moreover, our firs are superior to oak in the tenacity with which they hold iron fastenings. Bolts and spikes will generally break before they can be drawn or backed out of fir, and iron never becomes "sick" when imbedded in it. . . .⁷³

There are several reasons for Douglas fir's desirability for shipbuilding. Fir holds fasteners better than oak because, as a soft wood, it swells much more than oak when immersed in water. In addition, fir contains a balsam that prevents deterioration of iron, an attribute lacking in oak.⁷⁴

Because of these qualities and the growing acceptance of Douglas fir as a shipbuilding material, the Pacific coast had the potential to become a major shipbuilding center.

This potential was realized long before the end of the

century. In 1875, fourteen shipyards were active on Puget Sound, and by the end of the era of coastal sailing schooners, more than fifty major shipbuilders operated on the west coast.⁷⁵ Hopkins noted in his 1874 report that there was a trade-off between building vessels at San Francisco (then still a major shipbuilding center) versus building on Puget Sound. Shipyards at San Francisco had the disadvantage of an increased lumber cost, while builders at Puget Sound had to obtain from San Francisco fasteners, sails, rigging, oakum, and other materials not available in the Pacific Northwest.⁷⁶ Nonetheless, shipbuilding became a big business that complemented the lumber mills. Both large mill companies and independent shippers were accumulating fleets, so the demand for vessels was great.⁷⁷

Although small yards operated all along the coast, the major west coast builders operated from San Francisco, Humboldt Bay, and Puget Sound. Of the Pacific coast's many well-known shipbuilders during the last half of the nineteenth century, three are of primary significance. One of the most well-respected builders on the coast was Matthew Turner, who opened his yard in San Francisco in 1868.⁷⁸ Between 1868 and 1882, Turner built fifty-six vessels totaling 5,115 tons, many of which were lumber schooners.⁷⁹

A notebook kept by Hall noted of Turner:

The old models were full and short forward. He [Turner] reversed the plan, and made them long and sharp forward, lean and full on the waterline aft. His

model was laughed at. They told him his brig would pitch and dive into the water and be always wet. But it did not turn out so. She was a good vessel, very fast and successful. . . . Mr. Turner built all his vessels on the general principle of a long forebody and a short after body.⁸⁰

Hall noted that Turner's designs were popular and widely imitated by other yards on the coast, which says a great deal concerning how he was regarded by his peers.

Another highly-regarded California builder was Hans D. Bendixsen, who operated a yard in Humboldt Bay. In his thirty-three years in the shipbuilding business, Bendixsen constructed 113 wooden vessels.⁸¹ It was common practice for Bendixsen to build several ships from a successful half-model, varying the dimensions to meet the particular requirements of the customer.⁸² Both *C. A. Thayer* and *Wawona* are preserved today as testimony to the skill with which Bendixsen constructed his vessels.

The third well-known, and perhaps most influential, west coast shipyard was the Hall Brothers Shipyard of Puget Sound. Because of its particular importance to this study, this yard will be discussed in detail in Chapter IV.

All in all, various shipyards built a vast fleet of schooners on the Pacific coast from the beginning of the lumber industry to the replacement of the sailing fleet with wooden, and later steel, steam vessels. Between 1860 and 1905, more than five hundred wooden sailing vessels greater than one hundred tons were built on the west coast.⁸³ It is

difficult to say exactly how many of these vessels were schooners built for the coastal lumber trade, but the percentage is high. The period between 1850 and the early twentieth century saw the rise and fall of an exceptional west coast shipbuilding industry.

Decline of the Pacific Coast Lumber Schooner

Although sailing schooners were used in the lumber trade up to World War I, the last order for a sailing schooner was placed in 1905.⁸⁴ Growing competition from the steam schooner introduced in the 1880s caused the steady decline of its wind-driven predecessor. The result of this competition was that "sailing schooner construction was suddenly pitched off just when it hit its peak" in the early twentieth century.⁸⁵

The first lumber schooners employing steam engines were traditional sail-driven schooners fitted with auxiliary steam machinery around 1880.⁸⁶ Steam-powered schooners were well suited to working conditions in the northern California dogholes, and they were initially employed in this aspect of the trade. The first documented vessel built from the keel up as a steam schooner was *Newsboy*, built in 1888 by Boole & Beaton of San Francisco. This vessel ran between Eureka and San Francisco.⁸⁷

As noted before, the change from sail to steam was a slow process, and never universal in the west coast lumber

trade. Many ship owners were slow to change, and some, like Pope and Talbot, never changed.⁸⁸ Initially, many ship owners were reluctant to switch, for several reasons. There was concern over loss of cargo space both in the hold and on deck, due to space needed for machinery and coal.⁸⁹ Another concern was the false impression that steam schooners could never be economically viable in anything but the short northern California run. This was because early steam schooners had fairly small carrying capacities, combined with the fact that larger coastal steamers had freight rates prohibitively high to carry lumber.⁹⁰ By the 1890s, however, steam schooners were regularly making the run from Puget Sound to southern California, proving critics wrong.

In the Great Lakes, the consort system of towing lines of schooners was a popular mode of transporting bulk cargos such as lumber in the late nineteenth century. This system never made significant inroads on the west coast, possibly due to different sailing conditions. Towing was not ignored altogether on the Pacific coast, however. It was employed to a certain degree on the California redwood coast during the late 1880s and 1890s. Competition from large steam schooners on this run made towing small schooners up the coast, which saved both time and wages, attractive to many small vessel owners.⁹¹ The practice of towing did not become common .

Until the first part of the twentieth century, steam

lumber schooners built on the west coast were "single-ended."⁹² This meant that steam machinery was near the vessel's stern, aft of the cargo-handling gear. The first double-ended steam schooner, *Daisy Mitchell*, was built in 1905 by Hans Bendixsen.⁹³ This innovation placed steam machinery amidships, allowing cargo to be stowed fore and aft, which significantly increased carrying capacity.⁹⁴

Wooden vessels involved in the west coast lumber trade experienced a brief boom during World War I, but this event generally marks the end of the use of wooden-hulled vessels in this trade. After this, steel-hulled ships dominated the market.⁹⁵

The coastal sailing schooner's longevity as the primary mode of Pacific coast lumber transport from mill to market is testimony to this vessel-type's historical importance. For more than half a century, the lumber schooner was a vital cog in the machinery of the Pacific coast lumber industry. The quality of vessels built for this trade was widely recognized. Three Hall Brothers' schooners built during the 1880s, *Dora Bluhm*, *Comet*, and *J. M. Colman*, were still hauling lumber in the first and second decades of the twentieth century, and only through mishap were their careers abbreviated.

NOTES

¹Merrit A. Edson, Jr. "The Schooner Rig, Its First Appearance and Development," *The American Neptune*, Vol. XLIX (Summer 1989), 198.

²K. Jack Bauer, *A Maritime History of the United States* (Columbia, SC: University of South Carolina, 1988), 32; Edson, "The Schooner Rig," 198.

³Edson, "The Schooner Rig," 205.

⁴Howard I. Chapelle, *The History of American Sailing Ships* (New York: Bonanza Books, 1935), 258.

⁵Henry Hall, *Report on the Shipbuilding Industry of the United States* (Washington: Government Printing Office, 1884), 93; Bauer, *Maritime History*, 191.

⁶Edson, "The Schooner Rig," 203.

⁷Hall, *Report on the Shipbuilding Industry*, 94.

⁸Chapelle, *American Sailing Ships*, 258-59.

⁹Bauer, *Maritime History*, 271.

¹⁰Hall, *Report on the Shipbuilding Industry*, 94.

¹¹Bauer, *Maritime History*, 271.

¹²Basil Greenhill, *Schooners* (Annapolis, MD: Naval Institute Press, 1980), 76.

¹³Greenhill, *Schooners*, 76.

¹⁴Ibid.

¹⁵Harriet Tracy DeLong, *Pacific Schooner Wawona* (Bellevue, Wash.: Documentary Book Publishing Corp., 1985), 1.

¹⁶Thomas R. Cox, *Mills and Markets* (Seattle: University of Washington Press, 1974), 245.

¹⁷David Warren Ryder, *Memories of the Mendocino Coast* (San Francisco: Privately Printed, 1948), 28-29; Roger Olmsted, *C.A. Thayer and the Pacific Lumber Schooners* (San Francisco: Ward Ritchie Press, 1972), 2.

¹⁸Wallace E. Martin, ed. *Sail and Steam on the Northern California Coast, 1850-1900* (San Francisco: National Maritime Museum Association, 1983), 166; Gordon Newell, ed. *The H.W. McCurdy Marine History of the Pacific Northwest* (Seattle: Superior Publishing Co., 1966), 80.

¹⁹Olmsted, C.A. Thayer, 2; Newell, *The H.W. McCurdy Marine History*, 68.

²⁰DeLong, *Pacific Schooner Wawona*, 1; Olmsted, C.A. Thayer, 4.

²¹Hall, *Report on the Shipbuilding Industry*, 133.

²²Cox, *Mills and Markets*, 247.

²³Ibid.

²⁴Ibid., 250.

²⁵Thomas R. Cox, "Single Decks and Flat Bottoms: Building the West Coast's Lumber Fleet, 1850-1929," *Journal of the West* Vol. XX (July 1981): 68.

²⁶John Lyman, "Notes on Hall Brothers." Unpublished document.

²⁷Henry N. Barkhausen, *Focusing on the Centerboard* (Manitowoc, MI: Manitowoc Maritime Museum, 1990), 10.

²⁸Ibid., 13.

²⁹Ibid., 14.

³⁰Ibid., 24.

³¹David R. MacGregor, *Schooners in Four Centuries* (Annapolis, MD: Naval Institute Press, 1982), 63; Stephen A. Haller and Roger Kelly, *Schooners, Sealers, and Steamers: Shipwrecks of San Miguel and Santa Rosa Islands, Channel Islands National Park, California* (San Francisco: Unpublished Manuscript, 1990), 16.

³²Charles Desmond, *Wooden Shipbuilding* (New York: Rudder Publishing Co., 1919; reprint, New York: Vestal Press, 1984), 55-56 (page references are to reprint edition).

³³Hall, *Report on the Shipbuilding Industry*, 131, 133.

³⁴Ibid.

³⁵Olmsted, C.A. Thayer, 2; Robert A. Weinstein, *Tall Ships on Puget Sound: The Marine Photographs of Wilhelm Hester* (Seattle: University of Washington Press, 1978), 45.

³⁶Weinstein, *Tall Ships on Puget Sound*, 45.

³⁷Ibid., 20.

³⁸Bauer, *Maritime History*, 271.

³⁹Olmsted, C.A. Thayer, 17.

⁴⁰MacGregor, *Schooners in Four Centuries*, 62.

⁴¹Olmsted, C.A. Thayer, 4.

⁴²DeLong, *Pacific Schooner Wawona*, 52.

⁴³Ibid., 51.

⁴⁴Ibid.

⁴⁵Ibid., 52.

⁴⁶Ibid., 4.

⁴⁷Olmsted, C.A. Thayer, 15.

⁴⁸Weinstein, *Tall Ships on Puget Sound*, 39.

⁴⁹Ibid.

⁵⁰Ibid.

⁵¹Cox, *Mills and Markets*, 248.

⁵²Ibid.

⁵³Hall, *Report on the Shipbuilding Industry*, 131.

⁵⁴Joe Williamson and Jim Gibbs, *Maritime Memories of Puget Sound* (Seattle: Superior Publishing Co., 1976), 54; MacGregor, *Schooners in Four Centuries*, 61.

⁵⁵Hall, *Report on the Shipbuilding Industry*, 133.

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⁵⁷Casper Thomas Hopkins. *Shipbuilding on the Pacific Coast (No. 2)* (San Francisco, CA: Board of Marine Underwriters, California Printing House, 1874.), 9-10.

⁵⁸Hall, *Report on the Shipbuilding Industry*, 132.

⁵⁹MacGregor, *Schooners in Four Centuries*, 61.

⁶⁰Hall, *Report on the Shipbuilding Industry*, 132.

⁶¹MacGregor, *Schooners in Four Centuries*, 61.

⁶²*Ibid.*, 62.

⁶³*Ibid.*

⁶⁴*Ibid.*, 109.

⁶⁵*Ibid.*, 62, 109. Prior to the *Inca*, the only five-master was built with a steamer hull.

⁶⁶John S. Hittell, *The Commerce and Industries of the Pacific Coast of North America* (San Francisco: A.L. Bancroft & Co., 1882), 35.

⁶⁷*Business Directory, and Guide to Washington Territory* (Olympia, Wash.: Murphy & Harned, 1872), 8.

⁶⁸Hall, *Report on the Shipbuilding Industry*, 131.

⁶⁹Hopkins, *Shipbuilding on the Pacific Coast*, 22.

⁷⁰*Ibid.*, 21.

⁷¹DeLong, *Pacific Schooner Wawona*, 14.

⁷²Hall, *Report on the Shipbuilding Industry*, 131.

⁷³Hopkins, *Shipbuilding on the Pacific Coast*, 21.

⁷⁴Hall, *Report on the Shipbuilding Industry*, 131.

⁷⁵Williamson and Gibbs, *Maritime Memories of Puget Sound*, 58; Gordon Newell and Joe Williamson, *Pacific Lumber Ships* (New York: Bonanza Books, 1960), 21.

⁷⁶Hopkins, *Shipbuilding on the Pacific Coast*, 18.

⁷⁷Newell and Williamson, *Pacific Lumber Ships*, 21.

⁷⁸Hall, *Report on the Shipbuilding Industry*, 132.

⁷⁹Ibid.

⁸⁰Henry Hall notebook, quoted in Jim Gibbs, *West Coast Windjammers* (New York: Bonanza Books, 1968), 41. The Henry Hall notebook is in the collection of the Penobscot Marine Museum at Searsport, Maine.

⁸¹Information on Bendixsen can be found in Jack McNairn and Jerry MacMullen, *Ships of the Redwood Coast* (Stanford, CA: Stanford University Press, 1945), 79; Newell and Williamson, *Pacific Lumber Ships*, 21; Olmsted, C.A. Thayer and the *Pacific Lumber Schooners*; and Delong, *Pacific Schooner Wawona*.

⁸²Olmsted, C.A. Thayer, 13.

⁸³Ibid, 2.

⁸⁴Ibid., 5.

⁸⁵Ibid.

⁸⁶Newell and Williamson, *Pacific Lumber Ships*, 61; McNairn and MacMullen, *Ships of the Redwood Coast*, 14.

⁸⁷Newell and Williamson, *Pacific Lumber Ships*, 67; McNairn and MacMullen, *Ships of the Redwood Coast*, 17.

⁸⁸Newell and Williamson, *Pacific Lumber Ships*, 67

⁸⁹McNairn and MacMullen, *Ships of the Redwood Coast*, 15.

⁹⁰Cox, *Mills and Markets*, 252.

⁹¹Ibid.

⁹²Bauer, *Maritime History*, 278.

⁹³McNairn and MacMullen, *Ships of the Redwood Coast*, 19.

⁹⁴Bauer, *Maritime History*, 278.

⁹⁵McNairn and MacMullen, *Ships of the Redwood Coast*, 19.

CHAPTER IV

HISTORY OF *DORA BLUHM*, *COMET*, AND *J. M. COLMAN*

The Hall Brothers built the schooners *Dora Bluhm*, *Comet*, and *J. M. Colman* at their Port Blakely shipyard between 1883 and 1888. They were built at a time when the demand for lumber from southern California was on the rise, increasing the need for coastal lumber schooners. As discussed in Chapter II, this increase in demand was sparked by the completion of the Santa Fe railroad into Los Angeles in 1885 and the resultant real estate boom. In addition to the need for lumber in the southern California metropolitan area, the newly completed railroad shipped lumber to markets in the southwestern United States. The *Los Angeles Daily Times* on June 10, 1883 noted that a "large number of lumber schooners are reported in the bay at San Pedro, loaded with lumber. The Arizona, New Mexico, and Texas trade is constantly increasing, and all the facilities of the lumber companies are taxed to the utmost to keep pace with the demand."¹

It is within this context that the Hall Brothers produced *Dora Bluhm*, *Comet*, and *J. M. Colman*. The three-masted design of the schooners reflected the current trend in lumber schooner construction. Three-masters began to replace the two-masted schooners during the 1870s, and by

the 1880s, the three-masters, which could carry up to 600,000 board feet of lumber, were dominant in the trade.

Hall Brothers Shipyard

The Hall Brothers of Puget Sound, the shipyard responsible for *Dora Bluhm*, *Comet*, and *J. M. Colman*, have been described by one modern historian as "the greatest of . . . all" Pacific coast shipbuilders.² Another notes that the "Hall Bros . . . are credited with having brought the sailing lumber schooner to the apex of its development."³ Whether one accepts these accolades or not, there is no question that the Hall Brothers' contribution to the Pacific shipbuilding industry, and the lumber trade, was substantial.

The Hall brothers, Isaac, Winslow G., and Henry K. (referred to as Henry K. to distinguish between him and Henry Hall the author), hailed from Cohasset, Massachusetts.⁴ The Hall family can be traced to New England before the American Revolution, of which the Hall brothers' grandfather James was a veteran.⁵ They were raised in a family that had strong ties with the sea; their father George Hall ran a Boston-Cohasset packet in the late 1820s.⁶ The Halls apprenticed in Cohasset and Medford, Massachusetts, where they became master carpenters.⁷ In 1848, Isaac began a shipbuilding business in Cohasset, which Henry K. later joined.⁸ They constructed several vessels;

the largest was the 787-ton ship *Greenwich*.⁹ Meanwhile, Winslow learned the caulking trade and studied naval architecture.¹⁰

During the American Civil War the three Hall brothers left New England for California, where they began shipbuilding.¹¹ Between 1863 and 1869, Isaac and Winslow built three two-masted schooners in San Francisco: *Sarah Louise*, *California*, and *Stranger*.¹² In 1873, Isaac went to Port Ludlow on Puget Sound with a contract to build a vessel for San Francisco interests. This vessel, the 107-ton schooner *Z. B. Heywood*, was the first Hall-built vessel constructed on Puget Sound.¹³ Soon after, Isaac returned to San Francisco and convinced his brother Winslow to join him in a shipbuilding enterprise. Winslow remained in San Francisco to work on designs, arrange contracts, and obtain sails, fastenings, cordage, and other items necessary in ship construction not available in the Pacific Northwest.¹⁴

In 1874, Isaac returned to Port Ludlow to manage the shipyard. The first vessel produced was the 155-ton, two-masted schooner *Annie Gee*, one of five vessels built by the Halls in 1874.¹⁵ In 1875, Isaac and Winslow's younger brother Henry K. Hall joined the partnership and began to work with Isaac at the Port Ludlow yard.¹⁶ In that year, the Halls built their first of many three-masted schooners, *Emma Utter*.¹⁷

Soon the Hall brothers gained a reputation for quality

work. An 1876 newspaper clipping from Washington Territory noted that

besides being one of the pleasantest mill towns in the territory, Port Ludlow is acquiring a high reputation for shipbuilding, Messrs. Hall Brothers having built 13 vessels there. . . . The vessels built by this firm are used in the coasting trade and rank among the best on this coast.¹⁸

Several milestones occurred in the Hall Brothers' business during 1876. They built the three-masted schooner *Reporter*, in which they retained ownership.¹⁹ This was the first of many vessels built by the Hall Brothers in which they retained an interest. They also constructed their largest vessel to date on the west coast, a 423-ton barkentine called *Quickstep*.²⁰ In addition to being the largest, it was also the first non-schooner-rigged vessel built by the Halls on the west coast. They retained ownership in this vessel, as well.

Isaac Hall died in 1879, and Henry K. became the manager of the Port Ludlow yard.²¹ The following year the closure of the Port Ludlow lumber mill forced the Hall Brothers to relocate near a convenient lumber source. Their seven years at Port Ludlow had been productive, however, with thirty-one vessels completed totaling 6,365 tons.²² These included fifteen lumber schooners, eight "Sandwich [Hawaiian] Island schooners," four barkentines, two steamers, a pilot boat, and a yacht.²³

At the end of 1880, the Hall Brothers chose Port

Blakely, Puget Sound, as their new location. The site was next to the Port Blakely Mill Company, owned by Renton, Holmes, and Co.²⁴ Renton promised to supply the Hall Brothers with lumber at a reasonable price, and even built a "set of wooden tracks shod with strap iron" at his [Renton's] expense to carry the lumber one-quarter mile to the shipyard.²⁵ On his visit to Port Blakely in December 1881, Henry Hall (the author) noted that the shipyard and the lumber mill were the only industries in Port Blakely.²⁶

In his 1884 *Report on the Shipbuilding Industry in the United States*, Hall discussed the Hall Brothers Shipyard at length. He pointed out that "The owners have fitted up the . . . yard at considerable expense, and have sent a delegate to Bath, Maine, to report on the labor-saving appliances there employed and to purchase steam saws, planers, and a full equipment for their yard."²⁷ According to Hall, the average cost of a vessel built by the Hall Brothers was seventy dollars per register ton, "but in consequence of good management and the use of machinery this cost is being steadily reduced, and it is now not in excess of the cost of vessels of similar sizes on the Atlantic coast."²⁸ In discussing the price of lumber at the Hall Brothers Shipyard, Hall mentioned that

for keelson pieces over 90 feet in length they [the Hall Bros.] pay \$16 a thousand; for less than 90 feet, \$11 a thousand; for bed logs for center-board schooners and rough, clear lumber for stanchions, \$16; planking clear of heart and knots, \$12; deck plank, planed,

\$22.50; for all the rest of the material in the ship, \$11; but the average of the vessel does not exceed \$12, and the average length of stuff is 20 feet more than that of eastern yards.²⁹

Hall described the Hall Brothers' schooners as "fast, handsome, and popular, and have long, sharp bows. . . . There is not a straight line on the surface of the hulls anywhere."³⁰

Hall also credited the Hall Brothers with innovations in lumber schooner construction. In his notebook, Hall described a barkentine under construction during his visit and noted that the "rudder post projects below the planking, an idea of the Hall Brothers."³¹ In addition, he mentioned that the barkentine had a "breast hook over the ports [lumber ports] forward, an idea of the Halls, now required in all vessels here."³²

Regarding payment, the Hall Brothers were probably typical of most west coast builders. Henry Hall noted that payment for vessels under construction usually took place in four installments: one-quarter when the frames were up, one-quarter when ceiling and deck-frames were in, one-quarter when the vessel was planked and decked, and one-quarter when completely finished.³³ Sometimes the builder would receive a small amount when the contract was signed, but this was unusual.³⁴

For more than twenty years, the Hall Brothers Shipyard remained an extremely important part of the community at

Port Blakely. Not only did they provide employment for a variety of tradesmen and a steady market for lumber from the Port Blakely mill, they also created investment opportunities for men in both the shipping and lumber industry.³⁵ In addition, one scholar noted the "frequent launchings of their ships provided gala social occasions for the tiny Blakely community. Offering rare relaxation these launchings attracted the entire small population free to attend them. . . ."36

In 1898, Winslow G. Hall died in San Francisco. Managerial duties there were turned over to George E. Billings, the husband of the Hall brothers' niece Maria.³⁷ He continued in that capacity until 1903, when he took over as full-time manager of the Halls' shipping fleet. Henry K. Hall retired from active management of the shipyard in 1902, following the completion of the five-masted schooner bearing his name.³⁸ At this time, Henry K.'s son James Hall became manager. Finally, in 1903, after completing the 1260-ton, five-masted schooner *George E. Billings*, the largest vessel built by the Hall Brothers, the yard was reorganized under new owners and moved to Eagle Harbor on Bainbridge Island.³⁹ The new yard was called the Hall Brothers Marine Railway and Shipbuilding Company, and James Hall remained the manager.⁴⁰ James Hall was soon replaced, however, and in 1904 the shipyard passed from family hands.

During their twenty-two years at Port Blakely (1881-

1903), the Hall Brothers built seventy-seven vessels. With thirty-one constructed at Port Ludlow, the total number of vessels completed at both yards is 108 vessels. This included eighty-two schooners (sixteen two-masters, twenty-three three-masters, forty four-masters, and three five-masters) for the coastal lumber trade, Sandwich (Hawaiian) Island trade, and Pacific lumber trade.⁴¹ Historian John Lyman notes that between 1877 and 1898, the Halls built eighteen sailing vessels and steamers for Hawaiian Island use, so it is likely that many of the schooners built by the Hall Brothers, with the exception of the five-masters, were used in the coastal lumber trade.⁴² At its height, the Hall Brothers Shipyard was described by Henry Hall as having "more contracts than they want."⁴³ Alan H. MacDonald, who worked for the Hall Brothers as a youth, remarked that the builders would have three vessels on the stocks at one time.⁴⁴ There is no doubt that the Hall Brothers' contribution to the maritime industries of the Pacific coast was great. The quality of their vessels was often noted, and their reputation on the west coast was unsurpassed.

Dora Bluhm

The schooner *Dora Bluhm* was first of the three schooners in this study off the ways, launched in March 1883. The first Certificate of Registry, dated April 30, 1883, records that the vessel had one deck, three masts, a

billet head, and an elliptic stern.⁴⁵ It was 133.7 feet long, 33.3 feet wide, 10.5 feet deep, and totaled 315.51 net tons.⁴⁶ The fore-, main-, and mizzenmasts all measured ninety feet in length, and each had forty-seven-foot topmasts.⁴⁷ During construction, the vessel was known simply as hull number forty.

The original contract for *Dora Bluhm* still exists, and gives a tremendous amount of detail concerning the vessel's construction and fitting.⁴⁸ Although it would be prohibitively long to relate all the information in the contract, a few of the more relevant details will be noted. The contract specifies all timber dimensions of the schooner, as well as the fastener size for each component. This information is especially useful for comparative analysis and identification of vessel remains (see Chapters VI and VII). *Dora Bluhm* was constructed entirely of Douglas fir, with the exception of stem and stern posts, which were "hardwood."⁴⁹ The contract also indicates that *Dora Bluhm* was equipped with a centerboard and bow and stern ports for loading lumber. The contract notes information on caulking and painting: the bottom of *Dora Bluhm* was painted with two coats of "Tar and Wonson's copper paint."⁵⁰ In addition, the vessel was fitted with "composition rudder braces, diamond-cut screw steering gear, 24-inch windlass purchase and double-gearred No. 3 capstan."⁵¹ The contract also specifies number and size of anchors, chain, and rope, as

well as furniture, fixtures, and ship's boats. It notes that the vessel was "to be fitted for sea with . . . all equipments for a coasting voyage with the exception of provisions."⁵² For this, the owners agreed to pay \$27,500 in U.S. Gold Coin over four installments.⁵³

The first registry records ten original owners for *Dora Bluhm*, most from San Francisco, with William G. Bluhm, also the master, owning the largest share (one-quarter); Winslow G. Hall retained a one-sixteenth share of the vessel.⁵⁴ The schooner was originally registered at Port Townsend, Washington.⁵⁵

Over the course of its career, *Dora Bluhm* changed enrollments and registrations thirty-six times. Only the most noteworthy will be discussed. A complete listing of the documents of enrollment and registration for the schooner *Dora Bluhm* are found in Appendix A. The most obvious characteristic of this listing is that the vessel changed from enrollment to registration, and back, frequently, often with the explanation "change of trade." Since Certificates of Enrollment were required for vessels involved in domestic trade, and Certificates of Registration were required for vessels in the foreign trade, the most logical explanation is that *Dora Bluhm* frequently took cargos of lumber to Mexico, or even further south, to Central or South America. The resolution of South American conflicts in the early 1880s created markets in both Peru

and Chile as those nations expanded railroad construction.⁵⁶ In addition, Mexican markets expanded during the 1880s and early 1890s.⁵⁷ Newspapers record lumber schooners making voyages south of the border, which support the explanation for changing from enrollments to registrations. References for *Dora Bluhm's* international voyages will be presented below.

The original registry was surrendered on May 29, 1883, and a Certificate of Enrollment was issued at San Francisco, *Dora Bluhm's* new home port.⁵⁸ During the first years of its career, the vessel's home port changed several times between San Francisco and Port Townsend. No other changes were recorded in its first four years of service. Presumably, the vessel was actively involved in the coastal lumber trade during this entire period. However, on March 23, 1887, Henry Moore replaced William G. Bluhm as *Dora Bluhm's* master and took a one-eighth share of the vessel, with Bluhm retaining a one-sixteenth interest.⁵⁹ Moore remained master for three and a half years, until October 6, 1890, when Frank E. Rensch took over both Moore's one-eighth share of the schooner and command of the vessel.⁶⁰ Several months later, on March 13, 1891, this was repeated as Roger Walton replaced Rensch as master and one-eighth owner of *Dora Bluhm*.⁶¹ Although no further major changes in ownership or command occurred until 1894, it is interesting to note that on January 25, 1892, Winslow Hall split his interest in the

schooner with his brother Henry K. Hall, giving them both a 1/32 interest in the vessel.⁶²

The schooner ran into its first major mishap in November 1892. The *San Francisco Chronicle* of November 23, 1892 carried the headline "THE DORA BLUHM LOST ON THE MEXICAN COAST." The article went on to say:

The schooner Dora Bluhm was wrecked a week ago near Topolobampo, on the Mexican coast, during a storm. The crew were saved. The first intimation of the disaster reached here yesterday in a dispatch from Captain Walton to W.H. Smith, the managing owner of the schooner. The vessel, which was driven on the rocks during a gale, is likely to prove a total loss, as well as the cargo of 300,000 feet of lumber. There was no insurance on the cargo, but local companies have risks on the vessel. The Bluhm left here on August 26th for Gray's harbor to load lumber for Mexico. . . .⁶³

This is significant because it shows that *Dora Bluhm*, sailing under a Certificate of Registration, was actively involved in carrying lumber to Mexico. It is therefore reasonable to assume that the nine previous Certificates of Registration were also issued before foreign voyages.

Contrary to the statement in the *Chronicle*, *Dora Bluhm* was refloated and towed to San Francisco, where it was laid up in Oakland Creek until August 1894.⁶⁴ The *Daily Humboldt Times* reported in July of that year that shipbuilder Hans D. Bendixsen, of Eureka, California, purchased the vessel while on a trip to San Francisco.⁶⁵ *Dora Bluhm* was towed to Humboldt Bay, arriving there on August 2, 1894:

THE WRECK ARRIVES. The tug *Vigilant*, with the schooner *Dora Bluhm* in tow, arrived off the bar about noon

yesterday, where she was met by the tug H.H. Buhne and relieved of her tow. There were eight men aboard the schooner and it took some time to transfer these to the Vigilant. . . . This done, the Vigilant put about and headed for San Francisco and the H.H. Buhne brought the schooner into the bay dropping her at Bendixsen's shipyard.

The *Dora Bluhm* has very little the appearance of being a condemned wreck. With the exception of her fore-topmast, her spars and rigging are intact, she is not waterlogged and above the waterline does not seem to be injured in the least. In fact, her injuries are all on the bottom, principally to her keel. It is said that Mr. Bendixsen paid \$2000 for her and in that case has secured a great bargain. The probable reasons for the owners selling her this cheaply is the fact that it had cost them about \$20,000 to float her and bring her to San Francisco from the Mexican coast where she was wrecked in 1892, and they did not care to expend any more money on her. She has been in Oakland Creek about two years and as there was very little demand for vessels of her size it was not thought profitable to repair her.⁶⁶

The last sentence of the above article indicates that four-masted schooners had begun to take over the coastal lumber trade in the late 1880s. The real estate boom in southern California ended by 1890 and demand for lumber diminished, so the number of three-masters in the trade declined.

Bendixsen repaired the damaged *Dora Bluhm*, and it sailed again on October 29, 1894.⁶⁷ This major change of ownership is reflected in the Certificate of Enrollment issued August 2, 1894. In it, the owners are listed as Jacob B. Levinson (five-eighths), Sun Insurance Co. (one-eighth), Edward Lycan (one-eighth), and William Huntoon (one-eighth), Huntoon representing the only one of the original investors to retain an interest.⁶⁸ Levinson is listed as the master, but was replaced by Peter Rice on

October 18, 1894.⁶⁹ Bendixsen himself does not appear as an owner until a new Certificate of Registry is issued February 5, 1895. At this time eleven new investors took the place of the previous owners, with Bendixsen owning one-quarter interest and Rice, the master, owning a one-eighth interest.⁷⁰ It is unknown why there is a discrepancy between the documents of enrollment and the newspaper account. It is possible that Levinson, Lycan, and the Sun Insurance Company purchased *Dora Bluhm* for Bendixsen and his group of investors.

Rice remained the schooner's master until October 15, 1895, when he was replaced by O. C. Larsen, but Rice retained an interest in the vessel until August 22, 1896.⁷¹ Larsen gained a one-sixteenth interest in *Dora Bluhm* on March 8, 1897, and gave it up, along with his command of the schooner, one year later, on March 16, 1898.⁷² At that time, E. C. Olsen became master and one-sixteenth owner.⁷³ This lasted just over a year, until April 19, 1899, when Olsen was replaced by N. F. D. Jorgensen as master and one-sixteenth owner.⁷⁴

It was during this period that *Dora Bluhm* suffered another mishap. On November 15, 1898, while on a voyage from San Pedro to Seattle with a load of crude oil, *Dora Bluhm* collided with the steamer *Dora* southeast of Cape Flattery, Washington.⁷⁵ Damage was not specified, but was estimated at only \$142. This is the only reference

discovered that mentions a lumber schooner carrying crude oil, obviously not a common practice.

While at San Pedro, on June 12, 1899, Haldor Smith replaced Jorgensen as master, and on December 29, 1899, as one-sixteenth owner of *Dora Bluhm*.⁷⁶ Beginning with enrollment number 112, on October 28, 1901, the schooner underwent a rash of unexplained owner and master changes, until becoming property of the Pacific States Trading Company on November 11, 1905.⁷⁷ *Dora Bluhm* remained property of the Pacific States Trading Co. until its demise on Santa Rosa Island in 1910, after four more changes in masters.

There exists a complete record of *Dora Bluhm's* voyages from 1903 until its 1910 loss. These are part of the San Francisco Marine Exchange's records of vessel transit.⁷⁸ The record provides a general pattern of activity. Between 1903 and 1910, *Dora Bluhm* most frequently carried lumber to San Pedro, although it occasionally called on San Diego, Redondo Beach, Ventura, and San Francisco. Its ports of origin were most frequently Eureka and Grays Harbor, but it also sailed from Astoria, Seattle, and Coos Bay. The fact that San Pedro was the most common port of call reflects a second southern California real estate boom in the first part of the twentieth century, when demand for lumber once again increased markedly. For example, the *Los Angeles Daily Times* on October 18, 1905 reported San Pedro's largest

shipping day in history, with forty vessels unloading cargoes and another sixteen waiting to unload. The article noted that "the sixteen vessels which lay in the outer harbor yesterday morning were all carrying full cargoes of lumber. They floated fully 15,000,000 feet. . . ."79

Dora Bluhm's voyages include fishing. From May 2 to September 11, 1906 and from April 14 to September 20, 1907, *Dora Bluhm* was codfishing in the Bering Sea. This was a common fate for sailing lumber schooners as steamers slowly pushed them out of the coastal trade.⁸⁰ Schooners were used because they were large, inexpensive, and easy to handle, often serving as "mother ships," which carried dories that a crew of twenty-five to thirty men used for fishing, returning to the schooner each evening to clean and salt their catch.⁸¹ The vessels generally left in the spring, and stayed in the Bering Sea codfishing grounds until they were full of fish or until the onset of winter.⁸²

The year 1907 proved to be costly for *Dora Bluhm*, with two accidents recorded within three months. On March 11, 1907, while entering San Francisco Bay with lumber from Rainier, Oregon, the schooner collided with the ship *Dirigo*.⁸³ As *Dora Bluhm* was passing the other ship, which was anchored off Meiggs Wharf, the winds died, the schooner's steering gear fouled, and a strong tide carried it into *Dirigo*. Damage to *Dora Bluhm* was estimated at six hundred dollars, which included a started bowsprit and loss

of the schooner's jibboom and headgear. *Dirigo* had its windlass carried away and suffered minor damage to its fore rigging.

Two months later on May 5, 1907, while codfishing in the Bering Sea, *Dora Bluhm* was caught in a gale with high seas and forty-five-mile-per-hour winds. The vessel suffered the loss of its head stays (estimated at three hundred dollars) and one crew member, forty-six-year-old Joseph Wright, of Massachusetts.⁸⁴ This was *Dora Bluhm's* final accident until its loss three years later.

The *Record of American and Foreign Shipping*, 1907 edition, notes that *Dora Bluhm* was caulked from keel to deck in August 1889, while in May 1898 it was docked and salted.⁸⁵ Salting was a common Pacific coast practice that consisted of filling the open spaces between frames, underneath the ceiling, with rock salt.⁸⁶ This prevented dry rot and helped the timber resist decay. It was thought to be so effective that insurance classification societies added one or two years to a vessel's classification if salted.⁸⁷ These dates likely represent the last time the vessel was either caulked or salted.

Before its final voyage from Coos Bay, *Dora Bluhm* sailed from San Francisco to Magdalena Bay, where it spent almost two months. This voyage's purpose is unrecorded, but the vessel returned to San Francisco in March 1910, where it was chartered for a voyage from Coos Bay to San Pedro. This

was *Dora Bluhm's* last voyage.

Comet

The second Hall Brothers' schooner considered in this study is *Comet*. Hull number forty-nine, as it was known during construction, was launched from the Port Blakely yard in October 1886. Once again, the original contract for the vessel survives, giving a complete record of construction. *Comet* had a length of 136.0 feet on the keel, 144.6 feet overall, with a breadth of 35.2 feet, a depth of 11.4 feet, and registered 429.74 gross and 408.26 net tons.⁸⁸ Like *Dora Bluhm*, it had one deck, three masts, a billet head, and an elliptic stern.⁸⁹ It was constructed entirely of Douglas fir, again with the exception of the stem and stern posts, which were "hardwood."⁹⁰ *Comet* was entirely iron fastened, with the addition of 1 1/4-inch locust treenails on the outer hull planking.⁹¹ The vessel was also equipped with a centerboard, and, like *Dora Bluhm*, had bow and stern ports for loading and unloading lumber.⁹² During construction, *Comet* was "salted from lower edge of wales to deck."⁹³ The rest of the fitting out and furniture was exactly the same as *Dora Bluhm*, down to the twenty-four inch windlass purchase and number three capstan.⁹⁴ For this vessel, the Hooper Brothers of San Francisco and C. F. S. Lass of Oakland agreed to pay \$30,000 in U. S. Gold Coin, over four installments.⁹⁵

Comet's first registration records Lass as master, and J. A. Hooper, and F. P. Hooper each owning one-third of the vessel.⁹⁶ The Hooper Brothers owned interest in several lumber companies, as well as shares in a fleet of lumber schooners, and were well known in the west coast lumber industry.

One reason for owning partial shares in many vessels was to minimize risk. As a result, owners were often willing to forego insurance. It was noted of John A. Hooper that "because of his diversified partial interest in so many vessels, the insurance companies were losers, as far as he was concerned, in premium collections over a long period of years. He 'carried his own insurance. . . .'"⁹⁷

Comet was originally registered at Port Townsend, Washington, on October 19, 1886. The Hooper Brothers and Lass remained the vessel's owners for its entire life, with various masters occasionally gaining small interests in the schooner. Although the owners remained the same for *Comet's* entire career, it was variously registered at Port Townsend, San Francisco, Eureka, San Diego, Port Angeles (Washington), and Los Angeles. Masters changed several times over the vessel's career, the most notable being F. E. Rensch from June 9 to July 16, 1904.⁹⁸ This is the same Frank E. Rensch that commanded *Dora Bluhm* for a short time in 1890-91. Nicolas Borgenson was captain of *Comet* for two major mishaps that occurred during its career, including its loss in

August 1911.⁹⁹

Comet was actively involved in the coastal lumber trade for the duration of its twenty-five-year career. Newspaper accounts from December and January 1892-93, as well as San Pedro port records from 1895-96 show that *Comet* frequently called on San Pedro from Puget Sound during this period.¹⁰⁰ Unlike *Dora Bluhm*, *Comet* was only issued Certificates of Registration three times during its career, all before 1895. Presumably, it did not make voyages south of the border as frequently as *Dora Bluhm*. In addition to records from the mid 1890s, the vessel transit records of the San Francisco Marine Exchange record *Comet's* voyages from 1903 to its loss in 1911. These records show that San Pedro and Santa Barbara were the vessel's most frequent destination, with occasional stops at San Francisco.¹⁰¹ Its most common port of origin was Aberdeen/Grays Harbor, but it also sailed from Port Blakely, Port Gamble, Port Townsend, and Port Hadlock.¹⁰²

Tonnage changes were noted for *Comet* on May 7, 1896 at Port Townsend, Washington. Enrollment number sixteen notes that the changes were made under the Act of March 2, 1895, which reduced net tonnage to 378.¹⁰³ Enrollment number 151, on February 23, 1905, further reduced net tonnage to 368, deducting 60.91 tons from the gross tonnage of 429 for crew space (25.86), master's cabin (14.89), boatswain's stores (5.96), storage of sails (5.96), and donkey engine and

boiler (8.24).¹⁰⁴ Although the construction contract specified that the forecastle be adapted for a donkey engine, this is the first time that one was mentioned on board *Comet*. Since it was not noted on the original contract, the schooner was presumably not built with one.

Four mishaps are recorded during *Comet's* career before its loss in 1911. The first occurred in Puget Sound on January 2, 1902.¹⁰⁵ *Comet* was sailing to Port Blakely from San Pedro with an empty hold when it was run down by the steamer *Rainier*. Although damage was estimated at five thousand dollars, the specifics were not noted. The damage was severe enough, however, that the schooner had to be towed to Port Townsend by *Rainier*.

The second accident recorded for *Comet* occurred on February 5, 1905, while anchored at Santa Barbara, California.¹⁰⁶ The schooner's anchor chain parted during a storm and the vessel crashed into the Santa Barbara Wharf. *Comet* suffered one thousand dollars in damage, but fortunately did not damage any other vessels.

Few details are known about the third mishap involving *Comet*. This occurred on March 3, 1907, when the schooner collided with the bark *General Faidherbs* at San Francisco.¹⁰⁷ The damage incurred by *Comet* is not known.

Comet's fourth accident occurred in February 1911 at San Francisco. On February 28, 1911, the *San Francisco Call* reported that the schooner *Comet* collided with the launch

John A, sinking the launch and drowning the two occupants.¹⁰⁸ Two days later, the *Call* ran the headline "CAPTAIN OF COMET ERRATIC IN ORBIT," and claimed Borgenson, the vessel's master, had given a false position for the accident.¹⁰⁹ The article reported that the position given by Borgenson was more than a mile from water deep enough for *Comet*, and that the master "had either made a careless mistake or performed a miracle."¹¹⁰ The report went on to say that

when the accident occurred Borgeson [sic] was on his way to sea under sail. A full gale was blowing at the time and in attempting the handling of a three masted schooner under canvas in a crowded harbor with weather conditions as they were on Saturday it is the general opinion that Captain Borgeson was taking liberties with the law of common sense.¹¹¹

Borgenson briefly stopped to report the accident to the managing owner of *Comet*, J. A. Hooper, and proceeded to sea, without giving an accurate account of the accident. The newspaper noted that "this is the first time on record that the captain of the boat that did the running down went to sea without giving the owner of the sunken boat at least an approximate bearing which would aid him in recovering his property."¹¹²

There was no further report of the incident. The next time *Comet* made headlines, it had wrecked on San Miguel Island.

J. M. Colman

The third schooner in this study was launched by the Hall Brothers in April 1888. *J. M. Colman* was 157.0 feet long, 37.0 feet in breadth, 11.3 feet deep, 471.95 gross tons, and 448.36 net tons.¹¹³ Like the other two schooners, it had one deck, three masts, a billet head, and an elliptic stern.¹¹⁴ It was built for J. J. McKinnon of San Francisco, who was the sole owner. Unfortunately, *J. M. Colman's* original contract has not been located, but a hand-written ledger sheet indicates the vessel was originally known as hull number fifty-six, and built for \$33,286.84.¹¹⁵ *J. M. Colman* was one of the largest three-masted schooners built on the coast, registering only thirteen gross tons less than the largest, *W. F. Jewett*.¹¹⁶ The first master of *J. M. Colman* was C. H. Atwood.¹¹⁷

Shortly after the first enrollment, *J. M. Colman* moved to San Francisco and McKinnon shifted half the interest in the vessel to Preston and McKinnon (seven-sixteenths) and John Simpson (one-sixteenth).¹¹⁸ Atwood remained master until November 10, 1890, when William Treanor took the helm.¹¹⁹ Treanor remained in command of the schooner until 1899 and one-eighth owner until 1901. In 1897, McKinnon again reduced his interest in *J. M. Colman*, to one-quarter, selling a one-eighth interest to C. A. Hooper and a three-sixteenths share to the Puget Sound Commercial Company of Port Gamble, among others.¹²⁰ C. A. Hooper was one of the

principal owners of *Comet* for its entire career.

Like *Comet*, *J. M. Colman* was active in the coastal lumber trade for the duration of its career. Newspaper accounts from 1892-93 indicate that *J. M. Colman* made regular voyages between Grays Harbor and San Francisco.¹²¹ Los Angeles port records from 1895 indicate that the schooner called on San Pedro often, as well.¹²²

A tonnage change was noted on the Certificate of Enrollment issued August 22, 1899.¹²³ Of 463 gross tons, 73.93 were deducted for a net tonnage of 389. Like *Comet*, 8.04 tons were deducted for a donkey engine and boiler. Since the original contract does not exist, it is not known whether *J. M. Colman* was originally equipped with a steam donkey. Enrollment number thirty is the first mention of a donkey engine on board the schooner.

The Certificate of Registry from September 26, 1899 shows that J. J. McKinnon, original owner of *J. M. Colman*, sold his remaining interest in the vessel. At that time, Julia Simpson (one-sixteenth) and James M. Colman (one-quarter) were added to the list of owners.¹²⁴ There is no information available on Colman, though it is likely that the vessel was named for this individual. Masters changed frequently during this period, until August 31, 1900, when Charles Peterson took command of the vessel at Tacoma, Washington.¹²⁵ Peterson remained master of *J. M. Colman* until its loss on San Miguel Island in 1905.

Ownership of the schooner changed hands for the last time on June 27, 1901, when the Pacific Shipping Company of San Francisco became the vessel's sole owner. Not much is known about this company. The 1904-05 *Lloyd's Register of Shipping* mentions C. A. Hooper and Co. of San Francisco as the "operating agents" for *J. M. Colman*.¹²⁶ It is not known whether Hooper had an interest in the Pacific Shipping Company. To add to the confusion, when reporting the wreck of *J. M. Colman*, the *Los Angeles Daily Times* indicated that the vessel was owned by the Hooper Brothers, who "compose the Pacific Lumber Company and are the largest stockholders in the San Pedro Lumber Company and Southern California Lumber Company."¹²⁷

Once again, data from the San Francisco Marine Exchange fills in the last years of the vessel's life. Record cards indicate that *J. M. Colman* hauled lumber to San Pedro, Redondo Beach, and San Francisco in its last years.¹²⁸ The cargos were loaded at Port Gamble, Aberdeen/Grays Harbor, Port Ludlow, Astoria, Port Townsend, and Everett.¹²⁹ Sailing time on the southbound trip to southern California averaged about two weeks, while the return trip to Puget Sound took about twice as long.¹³⁰

Haller and Kelly discuss one other mishap that befell *J. M. Colman* before its loss in 1905. They note the San Francisco Marine Exchange records that the vessel entered dry dock in April 1902 at Port Townsend, Washington with a

"rudder stock twisted and gudgeons gone. . . ." ¹³¹ The nature of the accident is not discussed, and no other accidents are known until the vessel wrecked on San Miguel Island in September 1905.

The hazards of the Santa Barbara Channel claimed these three Hall-built schooners within a six-year period: 1905-1911. Although each vessel had made the same voyage dozens of times, some factor, natural or human, affected their last voyages, with disastrous results.

NOTES

¹*Los Angeles Daily Times*, 10 June 1883, p. 4.

²Gordon Newell and Joe Williamson, *Pacific Lumber Ships* (New York: Bonanza Books, 1960), 21.

³K. Jack Bauer, "Pacific Coastal Commerce in the American Period," *Journal of the West*. Vol. XX, No. 3 (July 1981), 16.

⁴John Lyman, "Hall Brothers of Port Blakely," *Log Chips of Recent Maritime History*. Vol. 2, No. 9 (November 1951), 97; Jim Gibbs, *West Coast Windjammers* (New York: Bonanza Books, 1968), 31. It should be noted that Gibbs's work is derived directly from Lyman's publication. For early information on the Hall Brothers, Lyman used Bigelow's *Narrative History of the Town of Cohasset* (1898), and Davenport's *Genealogies of the Families of Cohasset* (1909).

⁵John Lyman "Early Days of the Hall Brothers," *Log Chips of Recent Maritime History*. Vol. 2, No. 10 (January 1952), 109.

⁶Lyman, "Early Days of the Hall Brothers," 109.

⁷Lyman, "Hall Brothers of Port Blakely," 97.

⁸Lyman, "Early Days of the Hall Brothers," 109.

⁹*Ibid.*; Notes on Hall Brothers from Henry Hall (the author) notebook, in *American Neptune*, Vol. V, No. 2 (April 1945), 85.

¹⁰Lucile McDonald, "Hall Brothers Shipbuilding: Port Ludlow-Port Blakely," *The Sea Chest*. Vol. II, No. 3 (March 1978), 100; Lyman, "Early Days of the Hall Brothers," 109.

¹¹Lyman, "Early Days of the Hall Brothers," 110.

¹²Lyman, "Hall Brothers of Port Blakely," 97; Gibbs, *West Coast Windjammers*, 31.

¹³Henry Hall, *Report on the Shipbuilding Industry of the United States* (Washington: Government Printing Office, 1884), 133; Lyman, "Hall Brothers of Port Blakely," 97; Gibbs, *West Coast Windjammers*, 31; Gordon Newell, ed. *The H.W. McCurdy Marine History of the Pacific Northwest* (Seattle: Superior Publishing Co., 1966), 21.

¹⁴Lyman, "Hall Brothers of Port Blakely," 97; Gibbs, *West Coast Windjammers*, 31-32; Newell, *H.W. McCurdy Marine History*, 21.

¹⁵Newell, *H.W. McCurdy Marine History*, 21; Lyman, "Hall Brothers of Port Blakely," 97; Gibbs, *West Coast Windjammers*, 31-32.

¹⁶Newell, *The H.W. McCurdy Marine History*, 21; Lyman, "Hall Brothers of Port Blakely," 98; Gibbs, *West Coast Windjammers*, 33.

¹⁷Lyman, "Hall Brothers of Port Blakely," 97; Gibbs, *West Coast Windjammers*, 32.

¹⁸1876 clipping in the Eldridge Morse scrapbook at University of Washington; quoted in Lucile McDonald, "Hall Brothers Shipbuilding: Port Ludlow - Port Blakely," 101.

¹⁹Lyman, "Hall Brothers of Port Blakely," 98; Gibbs, *West Coast Windjammers*, 32.

²⁰Lyman, "Hall Brothers of Port Blakely," 97; Gibbs, *West Coast Windjammers*, 32.

²¹Lyman, "Hall Brothers of Port Blakely," 98; Gibbs, *West Coast Windjammers*, 33; Harriet Tracy Delong, *Pacific Schooner Wawona* (Bellevue, Wash: Documentary Book Publishing Corp., 1985), 30.

²²Hall, *Report on the Shipbuilding Industry*, 135.

²³Ibid.

²⁴Lyman, "Hall Brothers of Port Blakely," 99; Gibbs, *West Coast Windjammers*, 33.

²⁵Robert A. Weinstein, *Tall Ships on Puget Sound: The Marine Photographs of Wilhelm Hester* (Seattle: University of Washington Press, 1978), 43.

²⁶Henry Hall Notebook, 85.

²⁷Hall, *Report on the Shipbuilding Industry*, 135.

²⁸Ibid.

²⁹Ibid.

³⁰Ibid.

³¹Henry Hall Notebook, 87.

³²Ibid.

³³Hall, *Report on the Shipbuilding Industry*, 133.

³⁴Ibid.

³⁵Weinstein, *Tall Ships on Puget Sound*, 45.

³⁶Ibid.

³⁷Lyman, "Hall Brothers of Port Blakely," 99; Gibbs, *West Coast Windjammer*, 33-34.

³⁸Lyman, "Hall Brothers of Port Blakely," 100; Gibbs, *West Coast Windjammers*, 34.

³⁹Lyman, "Hall Brothers of Port Blakely," 100; Gibbs, *West Coast Windjammers*, 34; Weinstein, *Tall Ships on Puget Sound*, 45; Joe Williamson and Jim Gibbs, *Maritime Memories of Puget Sound* (Seattle: Superior Publishing Co., 1976), 57.

⁴⁰Lyman, "Hall Brothers of Port Blakely," 100; Gibbs, *West Coast Windjammers*, 34; Delong, *Pacific Schooner Wawona*, 76.

⁴¹From list included in McDonald, "Hall Brothers Shipbuilding," 106-107.

⁴²Lyman, "Hall Brothers of Port Blakely," 98.

⁴³Henry Hall Notebook, 87.

⁴⁴Alan H. MacDonald, *The Sea Chest* (June 1971); quoted in Weinstein, *Tall Ships on Puget Sound*, 45.

⁴⁵Registry 33, Port Townsend, Washington, 30 April 1883, Record Group 41, National Archives, Washington D.C.

⁴⁶Registry 33. The term "tons" is a measure of volume, not weight.

⁴⁷Contract number 40, Schooner *Dora Bluhm*, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

⁴⁸Ibid.

⁴⁹Ibid.

⁵⁰Ibid.

⁵¹Ibid.

⁵²Ibid.

⁵³Ibid.

⁵⁴Registry 33.

⁵⁵Registry 33.

⁵⁶Thomas R. Cox, *Mills and Markets: A History of the Pacific Coast Lumber Industry to 1900*. (Seattle: University of Washington Press, 1974), 215.

⁵⁷Ibid, 221.

⁵⁸Enrollment 333, Port of San Francisco, 29 May 1883, Record Group 41, National Archives, Washington D.C.

⁵⁹Enrollment 154, Port of San Francisco, 23 March 1887, Record Group 41, National Archives, Washington D.C.

⁶⁰Enrollment 62, Port of San Francisco, 6 October 1890, Record Group 41, National Archives, Washington D.C.

⁶¹Enrollment 145, Port of San Francisco, 13 March 1891, Record Group 41, National Archives, Washington D.C.

⁶²Registry 60, Port of San Francisco, 25 January 1892, Record Group 41, National Archives, Washington D.C.

⁶³*San Francisco Chronicle*, 23 November 1892, p. 12.

⁶⁴*Daily Humboldt Times*, 22 July 1894; in *Sail and Steam on the Northern California Coast, 1850-1900*, ed. Wallace E. Martin (San Francisco: National Maritime Museum Association, 1983), 236-237.

⁶⁵*Daily Humboldt Times*, 31 July 1894; in Martin, *Sail and Steam*, 237.

⁶⁶*Daily Humboldt Times*, 3 August 1894; in Martin, *Sail and Steam*, 237.

⁶⁷*Humboldt Times*, 2 January 1895; in Martin, *Sail and Steam*, 243.

⁶⁸Enrollment 22, Port of San Francisco, 2 August 1894, Record Group 41, National Archives, Washington D.C.

⁶⁹Enrollment 22.

⁷⁰Registry 65, Port of San Francisco, 5 February 1895, Record Group 41, National Archives, Washington D.C.

⁷¹Enrollment 1, Port of San Francisco, 2 July 1895, Record Group 41, National Archives, Washington D.C.; Enrollment 34, Port of San Francisco, 22 August 1896, Record Group 41, National Archives, Washington D.C.

⁷²Enrollment 167, Port of San Francisco, 8 March 1897, Record Group 41, National Archives, Washington D.C.; Enrollment 203, Port of San Francisco, 16 March 1898, Record Group 41, National Archives, Washington D.C.

⁷³Enrollment 203.

⁷⁴Enrollment 244, Port of San Francisco, 19 April 1899, Record Group 41, National Archives, Washington D.C.

⁷⁵Wreck Report #27, Schooner *Dora Bluhm*, 18 January 1899, Record Group 36, National Archives, Pacific Sierra Region.

⁷⁶Enrollment 244; Registry 50, Port of San Francisco, 29 December 1899, Record Group 41, National Archives, Washington D.C.

⁷⁷Enrollment 88, Port of San Francisco, 11 November 1905, Record Group 41, National Archives, Washington D.C.

⁷⁸Records of vessel transit of the San Francisco Marine Exchange, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

⁷⁹*Los Angeles Daily Times*, 18 October 1905, p. 1

⁸⁰Roger Olmsted, *C.A. Thayer and the Pacific Lumber Schooners* (San Francisco: Ward Ritchie Press, 1972), 2; DeLong, *Pacific Schooner*, 2.

⁸¹Olmsted, *C.A. Thayer*, 8; DeLong, *Pacific Schooner*, 2.

⁸²Olmsted, *C.A. Thayer*, 8.

⁸³Wreck Report #151, Schooner *Dora Bluhm*, 18 April 1907, Record Group 36, National Archives, Pacific Sierra Region; Wreck Reports of the Point Reyes Lifesaving Station, 1898-1915, Record Group 36, National Archives, Pacific Sierra Region.

⁸⁴Wreck Report #67, Schooner *Dora Bluhm*, 31 October 1907, Record Group 36, National Archives, Pacific Sierra Region.

⁸⁵*Record of American and Foreign Shipping*, 1907 edition, Shipmaster's Association of New York, 461.

⁸⁶Charles Desmond, *Wooden Shipbuilding* (New York: Rudder Publishing Co., 1919; reprint, New York: Vestal Press, 1984), 103.

⁸⁷Desmond, *Wooden Shipbuilding*, 103.

⁸⁸Contract number 49, Schooner *Comet*, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park; Registry 18, Port Townsend, Washington, 19 October 1886, Record Group 41, National Archives, Washington D.C.

⁸⁹Registry 18.

⁹⁰Contract number 49.

⁹¹*Ibid.*

⁹²*Ibid.*

⁹³*Ibid.*

⁹⁴*Ibid.*

⁹⁵*Ibid.*

⁹⁶Registry 18.

⁹⁷Aubrey Drury, *John A. Hooper and California's Robust Youth* (San Francisco, CA, 1952), 53.

⁹⁸Enrollment 16, Port of Los Angeles, 11 June 1895, Record Group 41, National Archives, Washington D.C.

⁹⁹Enrollment 6, Port of San Diego, 1 March 1910, Record Group 41, National Archives, Washington D.C.; Enrollment 261, Port of San Francisco, 27 May 1910, Record Group 41, National Archives, Washington D.C.

¹⁰⁰*San Francisco Chronicle*, 17 December 1892, 30 December 1892, 12 January 1893, 25 January 1893; Ernest Marquez, *Port Los Angeles-A Phenomenon of the Railroad Era* (San Marino, CA: Golden West Books, 1975), 127-128.

¹⁰¹Records of Vessel Transit of the San Francisco Marine Exchange, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

¹⁰²Ibid.

¹⁰³Enrollment 16.

¹⁰⁴Enrollment 151, Port of San Francisco, 23 February 1905, Record Group 41, National Archives, Washington D.C.

¹⁰⁵Wreck Report (no #), Schooner *Comet*, 4 January 1902, Record Group 36, National Archives, Pacific Sierra Region.

¹⁰⁶Wreck Report #169, Schooner *Comet*, 23 February 1905, Record Group 36, National Archives, Pacific Sierra Region.

¹⁰⁷Wreck Reports of the Point Reyes Lifesaving Station, 1898-1915, Schooner *Comet*, 22 August 1907, Record Group 36, National Archives, Pacific Sierra Region.

¹⁰⁸*San Francisco Call*, 28 February 1911, p. 30.

¹⁰⁹*San Francisco Call*, 2 March 1911, p. 12.

¹¹⁰Ibid.

¹¹¹Ibid.

¹¹²Ibid.

¹¹³Enrollment 43, Port Townsend, Washington, 3 May 1888, Record Group 41, National Archives, Washington D.C.

¹¹⁴Ibid.

¹¹⁵Ledger sheet no. 56, *J.M. Colman*, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

¹¹⁶Stephen A. Haller and Roger Kelly, *Schooners, Sealers, and Steamers: Shipwrecks of San Miguel and Santa Rosa Islands, Channel Islands National Park* (San Francisco: Unpublished Manuscript, 1990), 22.

¹¹⁷Enrollment 43.

¹¹⁸Enrollment 43, Port of San Francisco, 16 June 1888, Record Group 41, National Archives, Washington D.C.

¹¹⁹Ibid.

¹²⁰Enrollment 120, Port of San Francisco, 15 January 1897, Record Group 41, National Archives, Washington D.C.

¹²¹*San Francisco Chronicle*, 16 November 1892, 26 November 1892, 9 December 1892, 6 January 1893, 8 February 1893, 14 February 1893.

¹²²Marquez, *Port Los Angeles*, 127-128.

¹²³Enrollment 30, Port Townsend, Washington, 22 August 1899, Record Group 41, National Archives, Washington D.C.

¹²⁴Registry 16, Port of San Francisco, 26 September 1899, Record Group 41, National Archives, Washington D.C.

¹²⁵Enrollment 313, Port of San Francisco, 16 May 1900, Record Group 41, National Archives, Washington D.C.

¹²⁶Haller and Kelly, *Schooners, Sealers, and Steamers*, 22.

¹²⁷*Los Angeles Daily Times*, 7 September 1905, p. 9.

¹²⁸Records of Vessel Transit of the San Francisco Marine Exchange, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

¹²⁹Ibid.

¹³⁰Ibid.

¹³¹Haller and Kelly, *Schooners, Sealers, and Steamers*, 22.

CHAPTER V

ENVIRONMENT AND WRECK EVENTS

Weather and Currents

The Northern Channel Islands, San Miguel, Santa Rosa, Santa Cruz, and Anacapa, form the southern boundary of the Santa Barbara Channel. Aligned in an east-west pattern, the islands roughly parallel the California mainland at this point on the coast. The Santa Barbara Channel's western entrance is flanked by Point Conception on the north and San Miguel Island, twenty-six miles from the mainland, on the south. The channel's eastern end is marked by Anacapa Island, eleven miles from shore, on the south. The complex interaction of currents, prevailing winds, and weather often makes conditions in the Santa Barbara Channel unpredictable and, at times, dangerous.

The prevailing winds in the Channel Islands blow from the northwest.¹ Produced by offshore high pressure, these winds can often be violent.² Fog is also a common threat in the Channel Islands and has caused the loss of many vessels. During periods of low visibility, the islands themselves become the primary threat, while offshore rocks and shoals become even more dangerous than usual.³

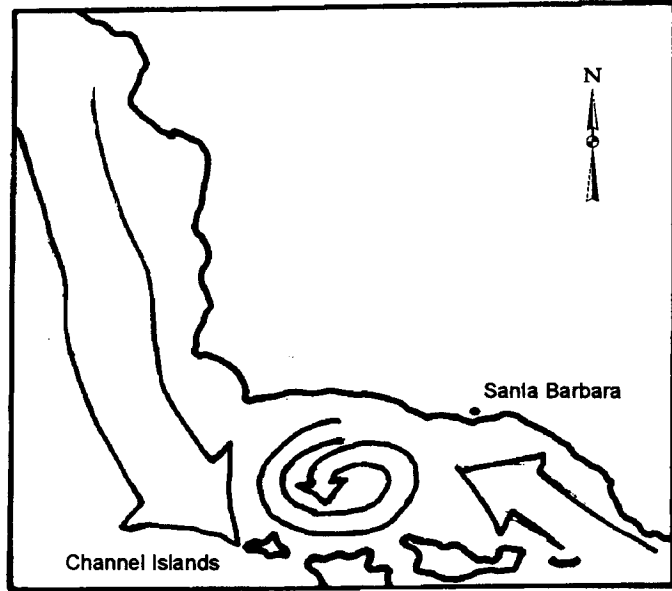
The main ocean current that influences the Channel Islands is the California Current, which generally flows

south along the coast.⁴ As it reaches Point Conception, however, the shoreline produces the Southern California Counter Current, a northward flowing eddy.⁵ This pattern generally prevails from July through November.⁶ From November through February, the weakening of the California Current produces the Davidson Current, which is manifested as a northward flow through the channel (Figure 5).⁷

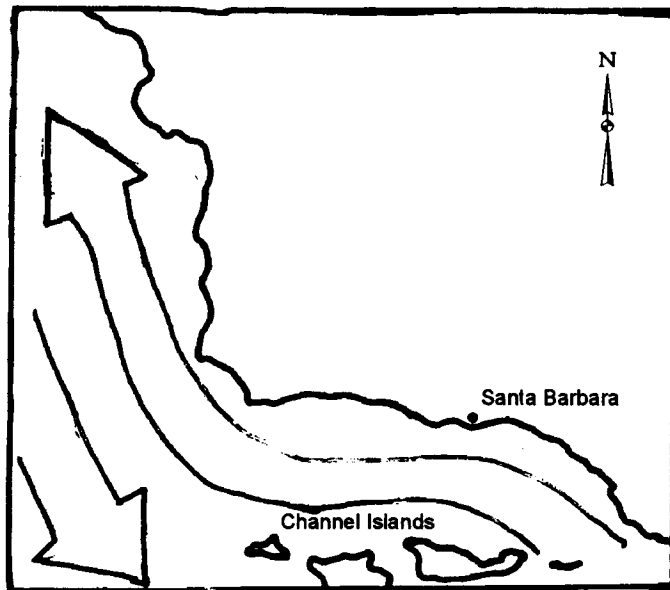
During the winter season, the northwest wind and the southern current combine to create difficult sailing conditions for a south-bound vessel. Increased speed due to the combination of environmental factors may have complicated dead reckoning. These conditions required sophisticated navigation and experienced captains.

Navigation

The primary navigation route along the California coast takes vessels either through or just outside (south) of the Santa Barbara Channel. Although it would seemingly be safer to avoid the islands altogether, the lure of a faster run made the Santa Barbara Channel the natural choice. As evidenced by the high concentration of wrecks in the Channel Islands, this may not have been the wise choice, though it was mandated by economic concerns. Although a lighthouse at the western entrance to the channel had been advocated for years, it was not until 1909 that the Lighthouse Board recommended erection of a navigational aid.⁸ Unfortunately,



Upwelling and Oceanic Periods - Mid-February to November



Davidson Period - December to Mid-February

Figure 5. Surface Currents

Congress did not appropriate money for the lighthouse until it was too late for the three Hall-built schooners.⁹ In 1911, shortly after *Comet* wrecked, a lighted buoy was placed southwest of Point Bennett, San Miguel Island's western-most point.¹⁰ The following year a flashing acetylene beacon atop a sixteen-foot buoy was anchored near Richardson Rock, a hazardous shoal just north of San Miguel Island.¹¹ A similar acetylene light was established in 1912 on Anacapa Island, at the eastern end of the Santa Barbara Channel.¹² This preceded Anacapa Island's present lighthouse, which was constructed in the early 1930s. Weather was the primary factor in *Dora Bluhm*, *Comet*, and *J. M. Colman's* loss, though human error also played a role in *Comet's* wreck.

J. M. Colman

J. M. Colman was the first to meet its fate in the Santa Barbara Channel. On August 26, 1905, the vessel departed Everett, Washington bound for San Pedro with 600,000 feet of lumber.¹³ The familiar voyage began normally, as it had numerous times. About six days out, sometime on Saturday, September 1, the schooner entered a thick fog and was forced to steer by dead reckoning alone. Then, without warning on Sunday evening, September 2, 1905, *J. M. Colman* struck San Miguel Island. The schooner's first mate, Frank Patterson, described the disaster:

About 10 o'clock Sunday night, while sailing before the

wind, at about nine miles an hour, in one of the thickest fogs I ever experienced, we suddenly struck a rocky reef on the sothwesterly [sic] shore of San Miguel Island. Before the accident we had not seen the sun for thirty-six hours, so thick was the weather, and had to sali [sic] by dead reckoning. After striking, the Coleman [sic] ground and pounded her way over the first reef, sinking down into deeper water between where she first struck and another reef, farther inshore.¹⁴

Fortunately, none of the ten-member crew was injured in the accident.¹⁵ After the vessel grounded, Patterson and four sailors took the ship's boat and set out for Santa Barbara for assistance. Captain Charles Peterson and the remaining four crew members stayed with *J. M. Colman*. Patterson and the others were picked up by the steamer *Mandalay* in mid-channel, and taken to San Pedro, where the first report of the wreck was delivered.¹⁶ Patterson reported the schooner's condition:

She is certainly very badly damaged and I doubt whether she can be saved. The lumber cargo can probably be taken off. She is in no immediate danger, as the prevailing west wind will not damage her and there is but little fear of the wind shifting to the southwest at this season of the year. After striking she filled rapidly. She is only kept afloat by her lumber cargo. . . .¹⁷

A *Los Angeles Daily Times* article reported *J. M. Colman's* value at twenty thousand dollars and the lumber cargo at ten thousand dollars. Both the initial reports in the *Times* and the *San Francisco Chronicle* speculated that the vessel would go to pieces and be a total loss.¹⁸ Nonetheless, the tug *Seawitch* from San Pedro and the steamer *Chehalis* from San Francisco were dispatched to render aid.¹⁹

After leaving San Pedro, Patterson and the crew traveled to Santa Barbara, where they chartered Captain Ira Eaton's vessel *Irene* to take supplies out to their shipmates on board *J. M. Colman*.²⁰ According to the story, when Eaton arrived at the wrecked schooner, he found Captain Peterson very upset because the "second mate had dived down after a chest of gold that had sunk when the ship hit the reef, and he had never come to the surface again. They supposed he must have drowned."²¹ Since this death was not reported in local newspapers, it is not known whether the second mate was really killed or not. Either way, the alleged "chest of gold" is surely either an island myth or a product of the fanciful imagination of Margaret Eaton, in whose diary the event was first mentioned. Even so, she mentions it again in her diary several years later. Frank Nidever, grandson of the famous Captain George Nidever, told Margaret and Ira a story of a diver who had supposedly been grabbed by an enormous, tentacled "devilfish" and nearly crushed to death. Nidever speculated that *J. M. Colman's* mate may have suffered the same fate as he dove after the lost gold.²² If nothing else, these amusing anecdotes show how quickly local myths grow up around exceptional events like shipwrecks.

The tug *Seawitch* returned to San Pedro on September 8 and reported it was unable to aid the stranded *J. M. Colman*.²³ The wrecked schooner had settled inshore among treacherous rocks and reefs, related the tug's captain, and

waves were breaking a half mile further offshore *J. M. Colman*; they could not get within a mile of the grounded vessel.²⁴ Regardless, the steamer *Marshfield*, owned by the same company as *J. M. Colman*, left San Pedro on September 8 to make a last-ditch effort to pull the schooner off.²⁵ Although this effort proved unsuccessful, the steamer did manage to salvage at least sixty thousand board feet of *J. M. Colman's* lumber.²⁶

The salvage of *J. M. Colman* continued for more than a year:

The schooner *Ellen*, Captain Vasquez, left for San Miguel Island yesterday for a load of lumber from the abandoned lumber schooner *Coleman* [sic]. Captain Vasquez has been engaged in the salvage work for some months past, and has taken a large amount of lumber from the wrecked vessel, but the *Coleman* is breaking up fast and it is not thought he will be able to make many more trips.²⁷

A later article noted that *Ellen* had recovered fifty thousand feet of lumber and that one hundred thousand feet remained. The total amount of lumber salvaged from *J. M. Colman* is unknown.

Left to the sea's fury, the schooner soon broke up and its remains scattered. It is not known how long this process took, but photographs provide a clue. Shortly after *Comet's* wreck in Simonton Cove, San Miguel Island in August 1911, a series of photographs were taken of the dismasted vessel on the beach. The pictures are by an unknown photographer, and several contain an unknown woman. This

same woman, wearing the same clothes, appears in two photographs taken in Northwest Cove, Point Bennett, San Miguel Island. The location of the photos as Northwest Cove is conclusively proven by the background terrain. Because the woman in the photographs is wearing the same cloths, it is probable that the *Comet* photographs and the Northwest Cove photographs were taken on the same trip, probably on the same day. The photographs in Northwest Cove show the woman sitting on a huge pile of timbers, several of which have been made into a make-shift lean-to. Because it cannot be discerned whether the timbers are from a wrecked vessel or not, what is more important about the photos is what they do not show. They do not show any intact structure from a sailing vessel. Because the photographer took a series of photos of the wrecked *Comet*, it maybe assumed that if there had been anything recognizable left of *J. M. Colman*, it would have appeared in at least one photograph. Therefore, it can be concluded that *J.M. Colman* was probably completely broken up by 1911.

Obviously, the preceding argument hinges on the assumption that *J. M. Colman* wrecked on Point Bennett. All newspaper accounts of the wreck agree the vessel grounded on San Miguel Island, but none give a precise location. Because the vessel's wreck report was not located, the only documented evidence for the wreck's location comes from the account of First Mate Frank Patterson in the *Los Angeles*

Daily Times. Patterson's only description is a "rocky reef on the sothewesterly [sic] shore of San Miguel Island."²⁸ It is highly unlikely, since *J. M. Colman* would have entered the Santa Barbara Channel from the northwest, that the vessel sailed around the western point of the island (Point Bennett) and grounded on the southwest shore. This is especially true in light of Patterson's next comment: "After striking, the Coleman ground and pounded her way over the first reef, sinking down into deeper water between where she first struck and another reef farther inshore."²⁹ A modern chart of San Miguel Island shows an extensive offshore reef system off Point Bennett's northwest coast, with virtually none south of the point. Therefore, the most likely approach of *J. M. Colman* as it neared San Miguel Island was from the northwest, where it struck one of the offshore reefs and drifted into Point Bennett, probably Northwest Cove.

Although *J. M. Colman's* loss was almost certainly a disaster for its owners, it, like other lumber schooner wrecks among the islands, was a blessing to island residents. There are at least two reports of lumber from *J. M. Colman* being utilized for island structures. William G. Waters, part owner of San Miguel Island, used burros to haul lumber from the wreck to the plateau above Cuyler Harbor where he constructed a ranch house in 1906.³⁰ The second report is from the diary of Margaret Eaton. On a trip to

Santa Cruz Island in 1908, Mrs. Eaton discussed a cabin in Willow Canyon on Santa Cruz Island that was supposedly constructed with lumber from *J. M. Colman*.³¹ Although it is hard to imagine lumber being hauled from San Miguel Island to Santa Cruz Island, it is easy to see that free lumber from the sea would readily be utilized by island residents who had no other source of inexpensive wood.

Dora Bluhm

The second of the three schooners lost in the Channel Islands was *Dora Bluhm*. The vessel's last port was Coos Bay, Oregon where it was loaded with 350,000 board feet of lumber at Smith's Mill.³² With its cargo destined for the Golden State Lumber Company of Los Angeles, *Dora Bluhm* left Coos Bay on May 19, 1910.³³ Like the other two schooners, *Dora Bluhm* had made the trip frequently, and had been sailing past the Channel Islands for twenty-seven years. On this particular trip, however, the weather got the best of both man and vessel. The master of *Dora Bluhm*, Captain Oscar Johnson, described the event:

We left Coos Bay for San Pedro seven days before the wreck and everything went along smoothly until Wednesday afternoon, when a heavy gale accompanied by thick weather was encountered. About seven o'clock I made out San Miguel Island and changed the vessel's course. The weather was very thick and about an hour later the schooner struck heavily on the southerly end of Santa Rosa Island. After she struck, the seas, which were running sky-high, swept completely over the deck of the ship and it was only with great difficulty and danger we succeeded in launching a boat. Although

the bottom was comparatively flat where the schooner struck she immediately broke in two, and in less than an hour she was a total wreck. We got away from the schooner none too soon. At the time of the accident the vessel was on the proper course and I attribute the wreck to a strong northerly current which runs like a mill-race between San Miguel and Santa Rosa Islands. Evidently this current caused the schooner to drift northerly and piled her on the beach.³⁴

As *Dora Bluhm* swept toward the island, Captain Johnson ordered sails struck and both anchors dropped, but this could not save the schooner.³⁵ As they launched the ship's boat seaman Alex Winter was washed out of the boat and narrowly escaped death by the quick actions of his shipmate, Jack Stevens, who caught him around the shoulders with a line.³⁶ The crew then set out for the mainland in the small boat without food or water and rowed until late the following day (newspaper accounts variously report sixteen to more than twenty-four hours later) until picked up by Captain Alex Smith in the gasoline-powered vessel *Santa Rosa Island*.³⁷

By all accounts, *Dora Bluhm* broke up quickly after striking the island. Both vessel and cargo were uninsured and a total loss for the owners.³⁸ Estimated value of *Dora Bluhm* was five thousand dollars, while the lumber cargo was ten thousand dollars. There are no reports of any attempt to salvage either the schooner or the cargo.

The precise wreck location is not mentioned in any accounts of the event, and is therefore unknown. The official wreck report filed by Captain Johnson with the

United States Life-Saving Service in Los Angeles states only that *Dora Bluhm* was lost on the "south point of Santa Rosa Island."³⁹ Both the *Los Angeles Daily Times* and the *San Francisco Chronicle* accounts report the vessel went ashore between the wrecks of the "*Golden Shore*" [*Goldenhorn*], lost in 1892, and the *Crown of England*, wrecked in 1896, both on the southern or southwestern shore of Santa Rosa Island.⁴⁰ This would place *Dora Bluhm* somewhere between Ford Point, location of the *Crown of England* wreck, and Sandy Point, nearly the western-most point of Santa Rosa Island. Although there is no documentary evidence, previous researchers have claimed *Dora Bluhm* wrecked on Bee Rock, just off the island's southwestern coast.⁴¹ This claim is not, however, consistent with newspaper reports which universally report the vessel went ashore on the island. Survey of the area between Ford Point and Sandy Point reveal the only physical evidence of a wrecked, ocean-going vessel on Cluster Point, Santa Rosa Island.

Comet

The third schooner, *Comet*, was lost August 30, 1911. The vessel left Aberdeen, Washington, on August 23, loaded with approximately five hundred thousand board feet of lumber bound for San Pedro.⁴² On Wednesday, August 30, at 8:00 p.m., while sailing in heavy seas with a thick fog, *Comet* struck what was reported as Richardson Rock,

approximately twenty miles south of Point Conception and seven miles north of San Miguel Island in the Santa Barbara Channel.⁴³ It was later determined that the schooner actually hit Wilson Rock, which is two and a half miles northwest of the island and closer to the final resting place of *Comet*.⁴⁴ After the vessel struck the treacherous rock, it was pulled off by the current and began drifting south towards San Miguel Island. The *Comet's* master, Captain Nicolas Borgenson, noted:

I thought when the *Comet* was freed from her first perilous position, that I would be able to bring her to Santa Barbara, but she filled rapidly and I soon found that she was badly stove in. She became water logged and I knew the best I could do was to beach her on San Miguel. She is lying in a favorable position and unless the seas become heavy, we may be able to get her off. Her hull must be in bad shape. There was a hard wind as well as a heavy fog when she struck. The ship's chronometer must have been faulty for we were about ten miles off our course.⁴⁵

It was later reported that *Comet's* chronometer was in San Francisco being repaired, and the vessel was using one on loan, which was not accurate and placed the schooner about eight to ten miles off course.⁴⁶

Captain Borgenson "lowered the sails to ease the strain" and then grounded the schooner in Simonton Cove, San Miguel Island.⁴⁷ He, his wife, several members of the crew, and the ship's cat boarded a boat and set out for shore.⁴⁸ They found the waves between them and the beach so great that they were forced to change course and head for Santa Rosa Island instead, where they remained all day Thursday,

August 31.⁴⁹ On the following morning Frank Pepper of the Santa Rosa Island Company took Borgenson, his wife, and the cat to Santa Barbara, where the first report of the wreck was made.⁵⁰ The rest of the crew returned to *Comet*.

On Friday, September 1, Borgenson set out for San Miguel Island to inspect the wreck. At that time, if he was not optimistic about the chances of saving *Comet*, he was at least hopeful about salvaging the cargo. Before he left Santa Barbara he remarked that he would examine the vessel to "decide whether she should be unloaded or whether she can be towed to port with the load on."⁵¹ He believed the schooner itself was "beyond repair."⁵²

When Borgenson arrived at the *Comet* that day, he was in for two unpleasant surprises. First, the schooner's second mate, Hans Maihbom, a twenty-four-year-old German, had drowned when he attempted to swim to the wrecked vessel from the beach.⁵³ The second piece of bad news was that conditions at the wreck site were so severe that salvage was impossible.⁵⁴ He reported at this time that the vessel was lying broadside to shore with the heavy seas pounding over its deck, and that its rigging had been entirely carried away.⁵⁵ He thought the wreck would soon be dashed to pieces.

On the morning of September 16, 1911, John A. Hooper, whose company owned *Comet*, arrived in Santa Barbara. He reported the vessel was likely to prove a total loss to him

and the other owners, as neither vessel nor cargo was insured.⁵⁶ There is some discrepancy in the historical record over how much that loss would be. The *Santa Barbara Morning Press* reported the vessel was valued at twelve thousand dollars and the cargo at thirteen thousand dollars.⁵⁷ The official wreck report filed by Captain Borgenson, however, noted that the schooner's value was five thousand dollars and the cargo three thousand dollars.⁵⁸ Because *Dora Bluhm's* 350,000 board feet of lumber was valued at \$10,000, it is more likely that *Comet's* 500,000 board feet was worth \$13,000 than \$3,000.

Because of *Comet's* exposed position and the high seas, which were breaking two to three hundred yards outside the wreck, it was impossible to salvage the cargo from the ocean-side. Deckload lumber was reported scattered along the island's shore for nearly a mile, but the cargo still within the vessel's hold was virtually intact.⁵⁹ This was no doubt a tempting prize for any salvager, considering the lumber cargo was worth more than the schooner even before it wrecked. The cargo's value is probably what led Mr. Vickers, one of the owners of Santa Rosa Island, to buy the wreck from Hooper, considering the questionable worth of the hull.⁶⁰ It was reported that Vickers intended to use the salvaged lumber for improvements to his cattle operations on Santa Rosa, and hoped to earn some of his money back through the sale of *Comet's* donkey engine.⁶¹

At this point, the historical record becomes somewhat sketchy. After the September 22 report of *Comet's* sale to Vickers, there is no further mention until October 16, 1911 when the *San Francisco Call* stated that salvage rights went to G. W. Waters, owner of San Miguel Island.⁶² Waters permitted no one to transport lumber to the beach for salvage, and, since salvage by sea was impossible, Waters purchased the rights to the wreck for an incredibly low one thousand dollars.⁶³ According to the article, Waters and his partner expected to clear about ten thousand dollars in the venture, and had already made enough from the rigging alone to cover expenses.⁶⁴

There are two likely explanations for what transpired. The first is that when Vickers heard that Waters would not allow salvage from land, he probably backed out of the deal, and Hooper was forced to sell to Waters. This is the most plausible explanation. The other interpretation is that the *Call* article had its facts mistaken, and that the sale to Vickers went through; he was then forced to sell to Waters for one thousand dollars. Either way, there is no doubt that Waters, through his perspicacity, was the ultimate winner in *Comet's* salvage.

As discussed above, a series of photographs were taken of *Comet* sometime after the wreck and before the vessel broke up. These photos, from the Santa Barbara Museum of Natural History's collection, show the schooner lying

broadside to the surf with its port side to sea. The vessel is firmly embedded in the sand, probably between the mean high- and low-tide lines. The foremast is still standing, but the main- and mizzenmasts are gone. Two photographs, taken from just forward of the foremast looking forward, show a man and woman standing on *Comet's* bow. These photographs are the key evidence in identifying wreckage in Simonton Cove as *Comet*. In the background of the photographs is an easily identifiable rock formation that is east of the wreckage in Simonton Cove today. Therefore, with the help of these historical photographs, a positive identification of the *Comet* wreck site can be made.

The fate of these schooners in the Channel Islands is not unique. Literally hundreds of vessels have grounded, foundered, or wrecked in or around this string of navigational hazards off the California coast. What makes these particular wrecks unique is that all three were built by the Hall Brothers Shipyard within five years of each other; all three carried lumber on the same route for over twenty years; and all three ended their careers under similar conditions in the same group of islands within six years of each other. This particular set of circumstances makes these three wrecks important to California's maritime history, and warrants a detailed archaeological examination of all three as a study collection.

NOTES

¹Don Morris, *Shipwrecks and Mishaps at Channel Islands National Park* (Unpublished Manuscript, 1990), np.

²Ibid.

³Ibid.

⁴Ibid.

⁵Ibid.

⁶Ibid.

⁷Ibid.

⁸*Santa Barbara Morning Press*, 2 September 1911, p. 8.

⁹Ibid.

¹⁰Lois Roberts, *Historic Resources Study - Channel Islands National Monument and San Miguel Island* (Chambers Consultants and Planner, 1978), 70-71.

¹¹Ibid.

¹²Ibid.

¹³*Los Angeles Daily Times*, 7 September 1905, p. 9.

¹⁴Ibid.

¹⁵Ibid.

¹⁶Ibid.

¹⁷Ibid.

¹⁸Ibid.; *San Francisco Chronicle*, 7 September 1905, p. 3.

¹⁹Ibid.

²⁰Margaret Holden Eaton, *Dairy of a* (Santa Barbara, CA: McNally & Loftin, 19

²¹Ibid., 24-25.

²²Ibid., 89.

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²³*Los Angeles Daily Times*, 9 September 1905, p. 7; *San Francisco Call*, 9 September 1905, p. 3; *San Francisco Chronicle*, 10 September 1905, p. 31.

²⁴*Ibid.*

²⁵*Ibid.*

²⁶*Los Angeles Daily Times*, 21 September 1905, p. 8.

²⁷*Santa Barbara News Press*, 7 November 1906, quoted in Morris, *Shipwrecks and Mishaps*, np.

²⁸*Los Angeles Daily Times*, 7 September 1905, p. 9.

²⁹*Ibid.*

³⁰Lois J. Roberts, *San Miguel Island: Santa Barbara's Fourth Island West* (Carmel, CA: Cal Rim Books, 1991), 77,99.

³¹Margaret Eaton, *Diary of a Sea Captain's Wife*, 38.

³²*Los Angeles Daily Times*, 28 May 1910, p. 10.

³³Wreck Report #1383, Schooner *Dora Bluhm*, 27 May 1910, Record Group 26, National Archives, Washington D.C.; *San Pedro Daily News*, 27 May 1910, p. 1.

³⁴*Los Angeles Daily Times*, 28 May 1910, p. 10.

³⁵*San Pedro Daily News*, 27 May 1910, p. 1; Wreck Report #1383.

³⁶*Los Angeles Daily Times*, 28 May 1910, p. 10.

³⁷*Ibid.*

³⁸Wreck Report #1383.

³⁹*Ibid.*

⁴⁰*Los Angeles Daily Times*, 28 May 1910, p. 10; *San Francisco Chronicle*, 28 May 1910, p. 1.

⁴¹Howorth and Hudson, 1985, in Morris, *Shipwrecks and Mishaps*.

⁴²Wreck Report #221, Schooner *Comet*, 11 September 1911, Record Group 26, National Archives, Washington D.C. Some newspaper accounts report a cargo of 620,000 BF, but the official wreck report states 500,000 BF.

⁴³Ibid.

⁴⁴*Santa Barbara Independent*, 14 September 1911; *Los Angeles Daily Times*, 15 September 1911, p. 15.

⁴⁵*Santa Barbara Morning Press*, 2 September 1911, p. 8.

⁴⁶*Santa Barbara Independent*, 16 September 1911.

⁴⁷Wreck report #221.

⁴⁸*Santa Barbara Independent*, 1 September 1911, p. 1; *Santa Barbara Morning Press*, 2 September 1911, p. 8.

⁴⁹*Santa Barbara Independent*, 1 September 1911, p. 1.

⁵⁰*Santa Barbara Morning Press*, 2 September 1911, p. 8.

⁵¹*Santa Barbara Independent*, 1 September 1911, p. 1.

⁵²*Santa Barbara Morning Press*, 2 September 1911, p. 8.

⁵³*Santa Barbara Morning Press*, 3 September 1911, p. 1.

⁵⁴Ibid.

⁵⁵Ibid.

⁵⁶*Santa Barbara Independent*, 16 September 1911.

⁵⁷*Santa Barbara Morning Press*, 2 September 1911, p. 8.

⁵⁸Wreck report #221.

⁵⁹*Los Angeles Daily Times*, 15 September 1911, p. 15.

⁶⁰*Santa Barbara Morning Press*, 22 September 1911, p. 8.

⁶¹Ibid.

⁶²*San Francisco Call*, 16 October 1911, p. 14.

⁶³Ibid.

⁶⁴Ibid.

CHAPTER VI

FIELD INVESTIGATIONS

During fall 1993, archaeologists documented and analyzed two beach shipwreck scatters in Channel Islands National Park, California. The wreck scatters, located in Northwest Cove, Point Bennett, on San Miguel Island and Cluster Point, Santa Rosa Island, may represent Pacific coast lumber schooners *J. M. Colman* and *Dora Bluhm*, built by the Hall Brothers Shipyard of Puget Sound. A third site, the wreck of the Hall-built schooner *Comet*, which is completely buried under beach sand, was also investigated.

While original research was directed toward comparative analysis of three Hall Brothers' hulls, this study became a methodological case study of interpreting isolated shipwreck elements and scattered structure. The Northwest Cove and Cluster Point Sites consist of scattered timbers and iron wreckage with no obvious association. Single elements are generally dismissed as unimportant or useless. This study demonstrates that systematic analysis of disarticulated structural remains can reveal the identification of each hull component and suggest likely associations. This project's initial goal was to document visible remains at Northwest Cove and Cluster Point and test whether these wreck scatters represent *J. M. Colman* and *Dora Bluhm*. Its

second goal included an examination of the Comet Site to determine extent of sand overburden covering the wreck and feasibility of uncovering and recording it. In addition, this study examined the natural site formation processes affecting these sites to see if they could provide evidence regarding likely associations. This project followed the National Park Service's program of minimum-impact archaeology. In this approach, only visible remains are recorded, leaving the resources virtually undisturbed. The only impact on the sites was removal of a small wood sample from each timber for species identification.

Methodology and Working Hypotheses

To test whether wreck scatters in Northwest Cove and Cluster Point represent *J. M. Colman* and *Dora Bluhm*, a series of hypotheses were developed that helped refine field methodology and guided the fieldwork.¹ These hypotheses are:

- 1) All cultural material located in Northwest Cove and Cluster Point is vessel-related and represents the remains of shipwreck events.
- 2) The vessel-related material located in Northwest Cove and Cluster Point represents remains of a single vessel at each location.
- 3) The vessel-related material located in Northwest Cove and Cluster Point represents the remains of

J. M. Colman and Dora Bluhm, respectively.

To determine if the wreck scatters were associated with *J. M. Colman* and *Dora Bluhm*, object attributes, scantling size, fastener type and size, and wood species were compared to the original construction contract of *Dora Bluhm* and to the *Rules for the Construction of Wooden Vessels*, published by the American Shipmaster's Association (1879).

Classification rules such as those published by the American Shipmaster's Association were used by marine underwriters to determine insurance premiums and establish minimum standards for ship construction for insurance purposes. Vessels built in the United States generally followed classification rules stipulated by the American Shipmasters' Association. These standards were published annually in the *Record of American and Foreign Shipping* beginning in 1870.² By comparing timber and fastener size from a shipwreck site to scantling sizes provided in the *Rules for the Construction of Wooden Vessels*, minimum vessel tonnage can be determined.

The first hypothesis is complicated by the fact that the archaeological record at both Point Bennett and Cluster Point has been contaminated by the "catch-all" nature of these areas, which has compromised associations by introducing intrusive material. Because of the northward flowing eddy of the southward flowing California Current just south of Point Conception, and the northward trend of

the Davidson Current through the Santa Barbara Channel, the Channel Islands collect flotsam from both northern and southern California. This is obvious to anyone who has spent any time walking the island's beaches. The geographical orientation of certain areas, among these Northwest Cove, Point Bennett, San Miguel Island and Cluster Point, Santa Rosa Island, make them especially favorable for collecting floating debris. This phenomenon is graphically portrayed by an example noted in the *Santa Barbara Morning Press*, November 3, 1906:

Heavy west-nor'west gales have been blowing in the channel near the islands for several days past;; and Captain Robards states that he had to lie under the east end of Santa Cruz for several days for safety. Captain Robards says that the wreckage of the Shasta, which went to pieces near Point Conception several weeks ago, is still in evidence, the greater part of the pilot house of the ill-fated schooner being now stranded on Bee kock on the south side of Santa Rosa Island [offshore from Cluster Point].³

This is just one dramatic example, but clearly wreck scatters at Cluster Point and Point Bennett have likely been contaminated by intrusive materials. This makes the job of determining associations complicated, but not impossible.

Despite contamination by flotsam, Point Bennett and Cluster Point are subject to predictable natural site formation processes. In this case, the collection of material at these sites arrived by one of two ways: 1) it floated in by wind and current, or 2) it was deposited by a wrecked vessel. There simply is no alternative. Although

it may not be possible to determine which is the case for every hull component at these sites, this analysis comprises an important step in explaining the archaeological record here.

Description of Work

Project personnel conducted field investigations from October 12-18, 1993 at Northwest Cove, Point Bennett, San Miguel Island (possible *J. M. Colman* site); October 19-23, 1993 at Simonton Cove, San Miguel Island (*Comet* site); and November 2-7, 1993 at Cluster Point, Santa Rosa Island (possible *Dora Bluhm* site). October was chosen for field work because of restrictions enforced on Point Bennett from December through September for protection of breeding seals, sea lions, and elephant seals. The week chosen for the Northwest Cove field work was scheduled around a series of extremely low tides, which were necessary to record material in the littoral or intertidal zone. Project personnel were accompanied to Point Bennett by a representative of the National Marine Fisheries Service to ensure minimal pinniped disturbance.

A site datum was placed on October 14 in Northwest Cove, Point Bennett by establishing horizontal control from a National Geodetic Survey (NGS) monument (Dune). A theodolite with an electronic distance meter (EDM) set up on the NGS brass cap was used to survey the datum. The datum

was set up in a central location within the wreck scatter. All wreck scatter locations were tied to this horizontal control.

The Northwest Cove Site (possible *J. M. Colman*) consists of two distinct components: ferrous metal objects lying in the intertidal zone, and a variety of wooden wreckage located in the supralittoral zone above the high-tide line. Presence of iron material is clearly the result of a wreck event, most likely from a single vessel, based on the close proximity and similarity of the items.

The wooden pieces on the beach, on the other hand, presented a very different case. The majority of wooden "wreckage" was not related to a shipwreck of any kind. There were hundreds of pieces of wood of every imaginable size and shape, from logs sixty feet long and four feet in diameter, to modern lumber and miscellaneous bits of driftwood. Of pieces that could be identified as ship-related, most were from modern, lightly constructed wooden boats. The first hypothesis, that all material was related to shipwreck events, had been proven wrong. Methodology was refined to determine what material was associated with a shipwreck of the size and age of *J. M. Colman*. The second and third hypotheses addressed the collection of material determined to be wreck remains, rather than the collection of material as a whole. The question was whether the assemblage was from a single vessel, and, if so, if the

remains could be *J. M. Colman*. This same revision would later be applied to the Cluster Point Site (possible *Dora Bluhm*) on Santa Rosa Island.

The team conducted a comprehensive walking survey of the cove, identifying timbers that might have come from a large, late-nineteenth-century, ocean-going vessel. This was, unfortunately, a qualitative rather than a quantitative process. The main characteristics considered were timber size and fastener evidence. Although there were many large timbers in the area, some of them did not contain a single fastener or fastener hole. These were not included in this study. In addition, several pieces that exhibited modern nuts and bolts or other modern characteristics were also eliminated from the study. Only those timbers with fasteners or fastener evidence consistent with late-nineteenth-century ship construction were included. This process of elimination narrowed the number of timbers studied to fifteen. These were labeled with temporary plastic tags numbered PB-001 through PB-015.

Project personnel conducted a comprehensive walking survey of the entire intertidal zone. The exceptional low tide on October 14 provided access to much of this area, and the survey yielded a total of nineteen pieces of iron material. Every accessible object was examined.

On October 15, the theodolite was set up over the site datum and angles turned to each feature. On the timbers and

larger iron objects, both ends were surveyed to provide orientation. The EDM provided accurate distances, so the position of all material was precisely recorded relative to the primary site datum.

Over the next two days, the crew made measured drawings and photographed each feature, in addition to collecting a wood sample from each timber. Project personnel recorded material in Northwest Cove, Point Bennett over a four day period.

On October 18, field operations moved from the west end of San Miguel Island to the east end, closer to the *Comet* Site. Unlike the wreck scatters at Northwest Cove and Cluster Point, the wreck located in Simonton Cove, San Miguel Island has been positively identified as *Comet*, using historical photographs (see above). The wreckage was almost totally uncovered by 1984 winter storms. At that time, several photographs were taken by a Channel Island National Park ranger; the pictures show extensive wooden shipwreck remains and a large anchor. At the beginning of this project, the tip of the anchor stock was the only visible feature protruding above the surface of the beach. Because the wreck has been exposed in the past, we could remove sand overburden without destroying undisturbed stratigraphy. In addition, a terrestrial magnetometer survey was conducted over the site to test the possibility of more extensive remains than appear in the 1984 photographs.

The first task was to establish a primary site datum. Unfortunately, the NGS monument shown on the topographic map could not be located, and no others were close enough to allow a reasonable traverse. Therefore, an arbitrary datum was established on the beach by driving a 5 foot length of 2-inch by 2-inch plank into the sand. A differential GPS position will be collected on this control point in the future.

Four volunteers arrived on October 19, and work began that afternoon. The tip of the anchor stock was used as a starting point for removing sand overburden. Project personnel and volunteers also spent October 20 and 21 excavating. The anchor was uncovered, along with a few timber ends, and nothing more. Although the timbers located are certainly from *Comet*, no details could be recorded because the walls of the hole kept collapsing as the timbers were exposed. In total, about 21 cubic yards of sand were removed from a hole 21 feet in diameter at the top and 7 feet deep. The few remains uncovered indicate that this site cannot be feasibly exposed without mechanical excavation. Barring landing a backhoe, *Comet* will have to wait for detailed recording until naturally uncovered.

To test for further remains, a terrestrial magnetometer survey was conducted over a twenty-meter by forty-meter area of the site, centered on the anchor. An EG&G Geometrics model G-856 terrestrial magnetometer was used, with a two

meter sample interval. With the exception of two points where the test hole was located, a reading was taken at each two meter interval, resulting in a data set of 227 points. A base station was not available, so these readings were not corrected for diurnal variations which reduce solar and local magnetic noise fluctuations. However, this data set should be viewed as a general magnetic representation of the site.

The project moved to Santa Rosa Island on November 2, 1993. Work began at Cluster Point the following day. The same methodology and techniques employed at the Northwest Cove Site at Point Bennett, San Miguel Island were used on the Cluster Point Site. Horizontal control was brought to the site from an NGS monument (Chino), and a site datum established at a location central to the Cluster Point material. The crew conducted a comprehensive walking survey of the area, with timbers and wreckage tagged for closer examination. Once again, any piece determined to be a possible ship scantling was included in the study, with association to be determined later. The primary difference between the Cluster Point Site and the Northwest Cove Site is that no material has been observed offshore from the Cluster Point area, and no iron material was located on the beach.

The walking survey yielded twenty-two timbers and planks probably from a vessel of late-nineteenth-century

construction. Although twenty-four timbers were originally tagged (CP-001 through CP-024), two were later eliminated as modern (CP-011 and CP-016). In addition, project personnel recorded fifteen loose iron fasteners of various sizes.

The next four days followed the same procedures as the Point Bennett survey. Positions of all material, including fasteners, were recorded with theodolite and electronic distance meter. Each piece was drawn to scale, photographed, and sampled for wood identification so that a determination could be made as to possible association with *Dora Bluhm*.

Description of Findings and Analysis

All three sites were examined concurrently so that inter-site comparisons could be made, possibly offering clues to the particular construction techniques used by the Hall Brothers. Because the Northwest Cove and Cluster Point Sites were highly scattered, and because the *Comet* Site lies deeply buried in the beach sand, a thorough comparison was not possible.

Northwest Cove Site

The Northwest Cove Site at Point Bennett, San Miguel Island, consists of two distinct components: the iron material in the intertidal zone, and the wooden wreckage above the high-tide line (Figure 6). With the exception of

a single, small piece of wood permanently concreted to the intertidal zone by iron fittings, and a single unidentified iron piece on the beach, these two components are totally discrete. All iron objects are firmly fixed to the rock bottom of this high-energy zone, and are therefore permanent, unmoving features of this area. The wooden material, on the other hand, even though above the high-tide line, is subject to shifting and movement from storm activity.

Other fundamental differences between the two concentrations include the observation that all intertidal zone material is definitely from a shipwreck, and furthermore, likely represents a single wreck event. In addition, unlike the collection of wooden components, which can float, there is no doubt as to how the iron collection came to be in Northwest Cove. Because the objects are clearly shipboard items, and it is physically impossible that they floated to this location, the only logical conclusion is that the collection was deposited by a wrecked or stranded vessel.

The next task is to determine whether the material is from a late-nineteenth-century sailing vessel, or, more specifically, *J. M. Colman*, based on object attributes. During field work, the nineteen items recorded in the intertidal zone were labeled PB-016 through PB-034, and will be referred to by these feature numbers during this

discussion.

The most diagnostic objects in the intertidal zone are two hawse pipes, features PB-016 and PB-034, of identical dimensions (Figure 7). Hawse pipes were located on each side of vessel's bow, and allowed the chain cable to pass through the hull. Hawse pipes are distinguishable from mooring pipes (which allowed mooring lines to pass through the bulwarks on the main deck) and chain pipes (which allowed the chain cable to pass through the main deck into the chain locker) by their length and their sloping outer faces, which must conform to a bow's compound curves. PB-034 is located 50 feet 6 inches northwest of PB-016. The two hawse pipes have the same dimensions, which, combined with their proximity, indicate that they likely came from the same vessel. The pipes have an overall length of 2 feet 11 inches, an outside diameter of 11 inches and an inside diameter of 9 inches.

What makes these items particularly diagnostic is that classification rules specified hawse pipe size used in a vessel be based on anchor chain cable size; and the size of the chain cable was specified for vessels based on registered tonnage (chain was measured by the diameter of the link). *J. M. Colman* had a registered tonnage of 463 gross tons and 389 net tons. *Desmond* (1919) includes tables showing specifications for chain cable size based on tonnage, and showing hawse pipe size based on chain cable

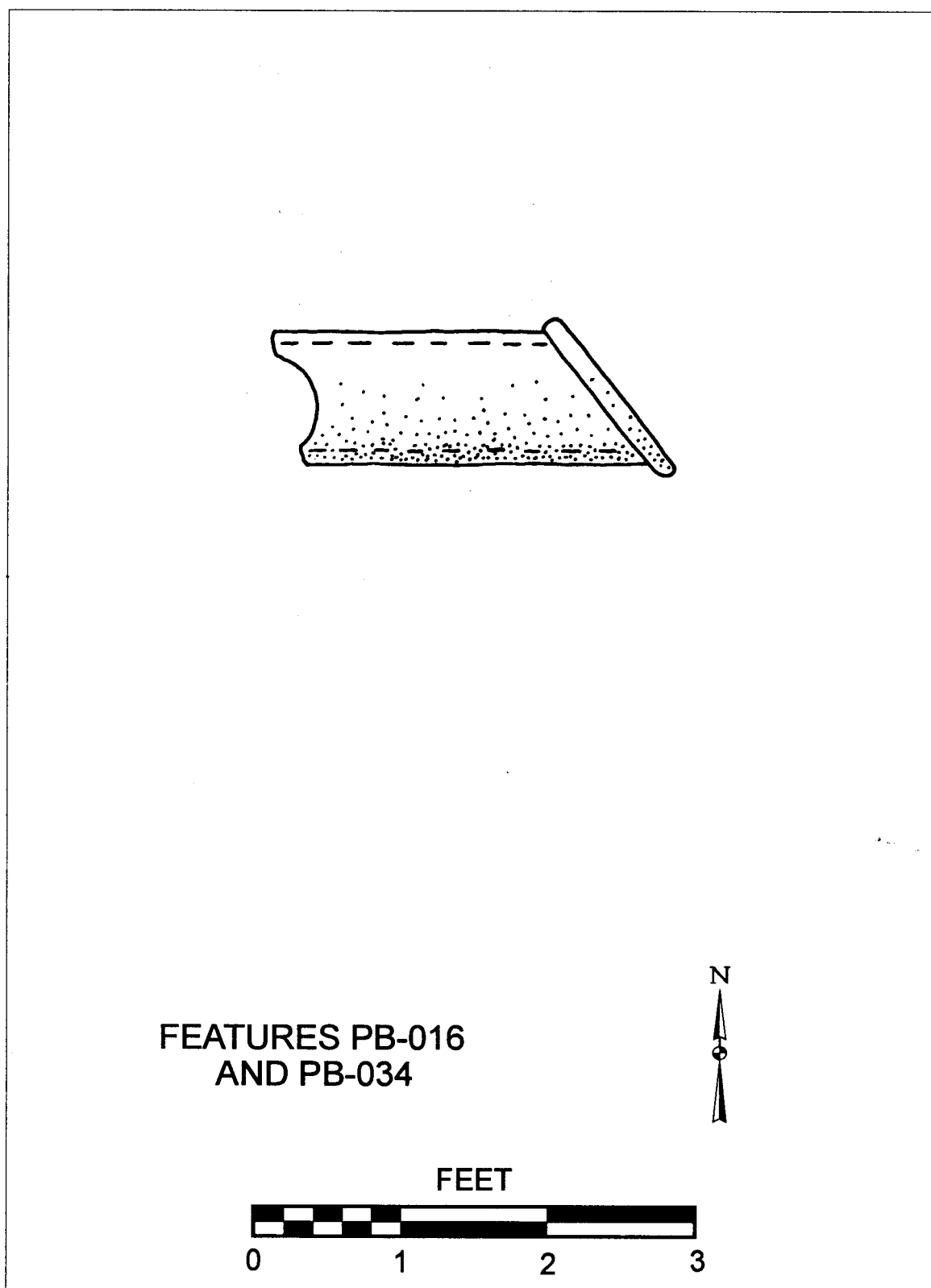


Figure 7

size. A wooden sailing vessel of 400 tons was required to carry a chain cable at least $1 \frac{5}{16}$ inches in diameter, which required a hawse pipe between $11 \frac{1}{2}$ and $12 \frac{1}{2}$ inches in diameter.⁴ As mentioned before, features PB-016 and PB-034 have outside diameters of 11 inches, so the size of the hawse pipes in Northwest Cove match reasonably well the size of *J. M. Colman*.

Feature PB-020 is another readily identifiable object, likely a steam donkey engine boiler (Figure 8). It is a cylinder approximately 6 feet 6 inches long and 3 feet in diameter; its interior filled with $2 \frac{3}{4}$ -inch diameter tubes for about $\frac{2}{3}$ of its length. Donkey engines, or "steam donkeys" as they were known, were found aboard coastal lumber schooners after the early 1880s.⁵ They were used for a variety of purposes, including loading and unloading cargo, hoisting the sails, and running the ship's pumps. The donkey engine was usually located in the forward deck house, as in the historic lumber schooner *C. A. Thayer*, which is on display at San Francisco Maritime National Historical Park. That vessel is a three-masted Pacific coast lumber schooner built in 1895 by Hans D. Bendixsen, and is very similar to *J. M. Colman*, *Comet*, and *Dora Bluhm*.

The only other object located in the intertidal zone that has been conclusively identified is PB-031 (Figure 9). This is the crosshead mechanism of a hand-operated, pump-brake windlass. An example of this mechanism can also be

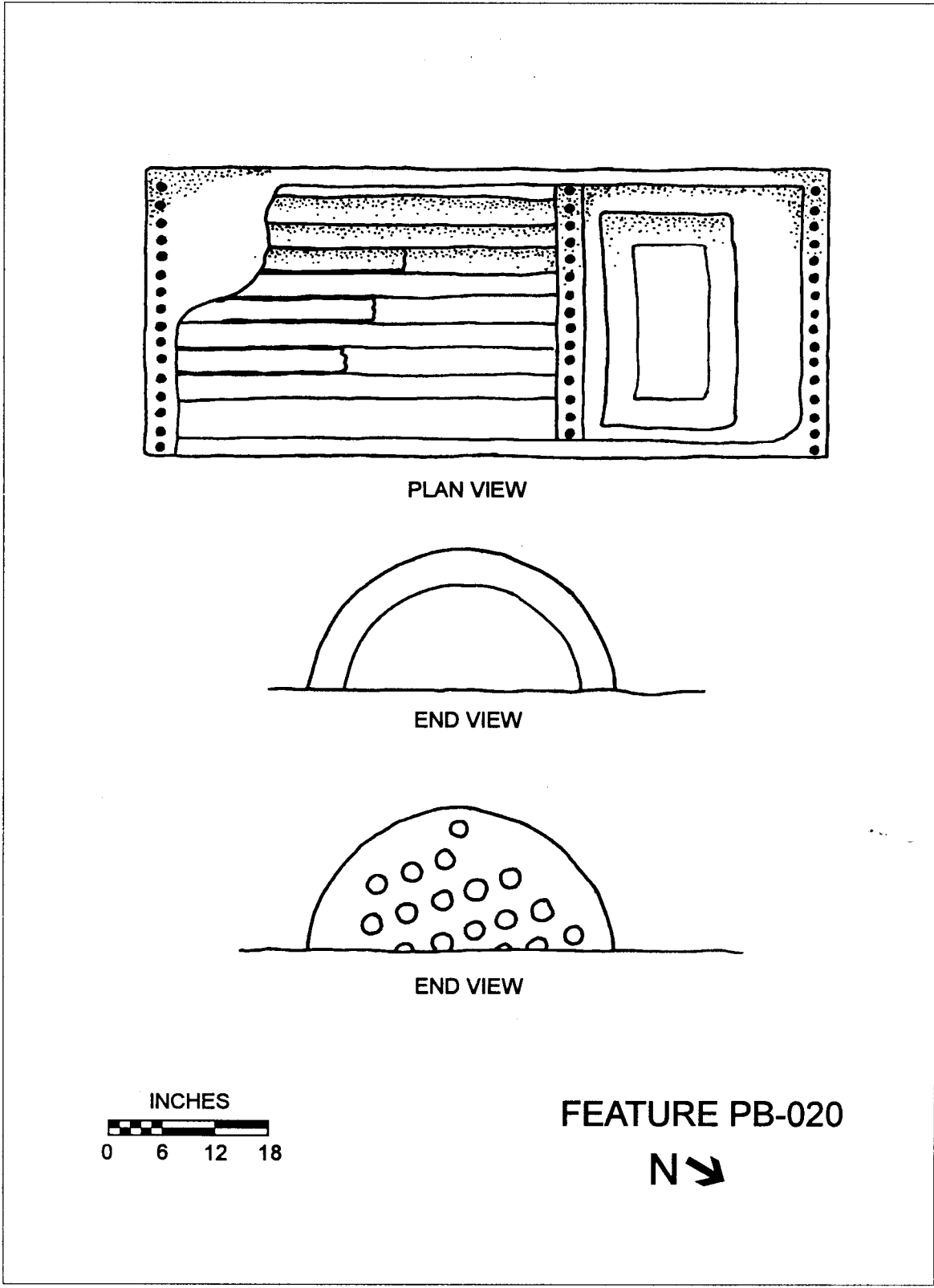


Figure 8

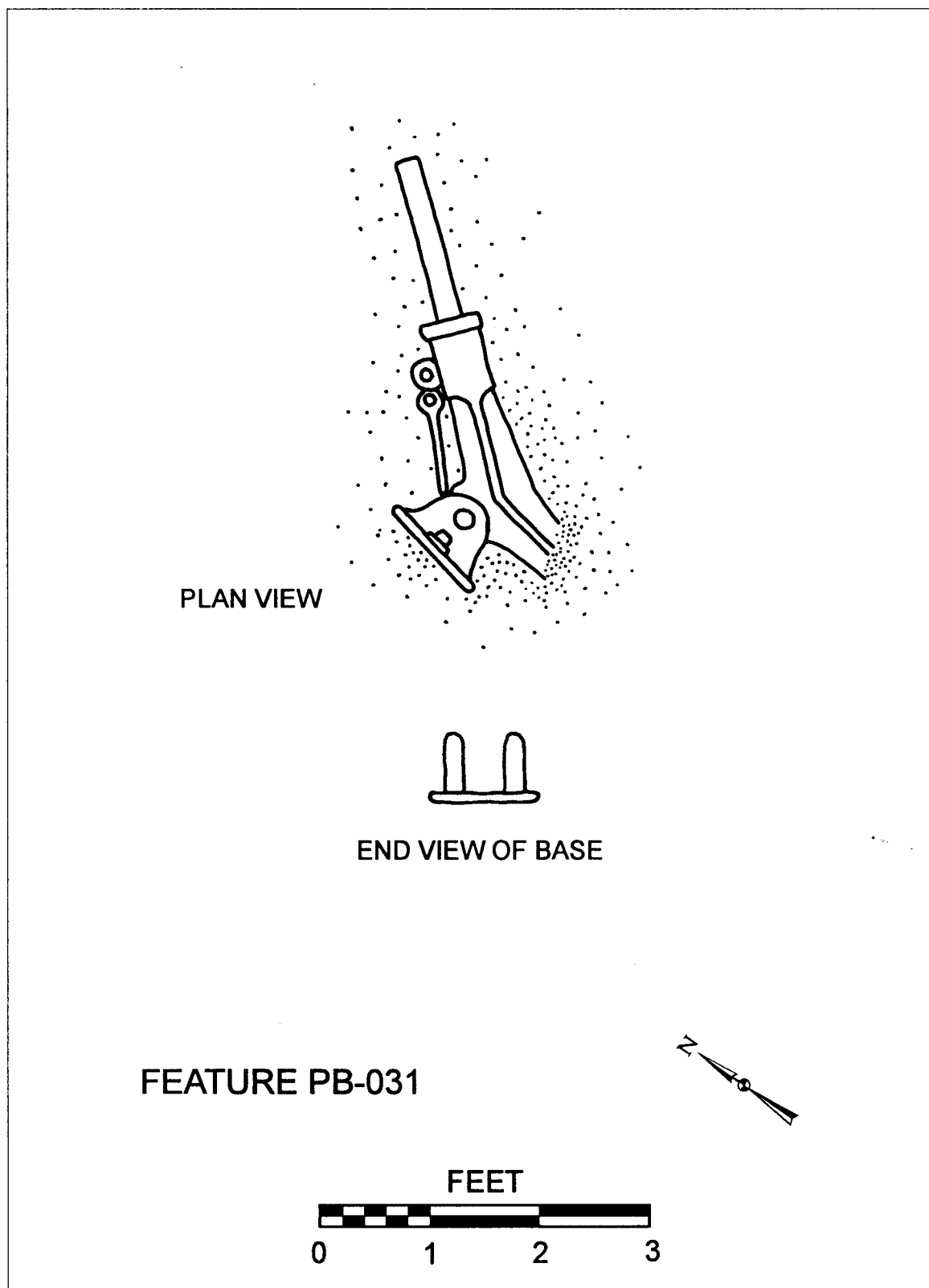


Figure 9

seen on board *C. A. Thayer*, where it is mounted on the forecastle deck, directly forward the sampson post above the windlass. The crosshead was attached to the windlass by connecting rods, which passed through the forecastle deck and connected to the purchase rims of the windlass.⁶

Removable handles were inserted into the crosshead and the up-and-down motion, supplied by two seamen, caused the purchase rims to rotate, turning the windlass.

Feature PB-031 is partially obscured by encrustation and marine growth, but it appears that a portion of one of the removable handles is present. The overall length of the piece is 4 feet. The base of the crosshead mechanism was secured to the forecastle deck with two iron fasteners, each 1 inch in diameter. The base itself is about 10 inches square and 6 1/2 inches tall. The size of this feature is similar to the crosshead mechanism found on *C. A. Thayer*.

The rest of the iron material in the intertidal zone has not been identified, but there are some obvious possibilities. Features PB-021/022 (actually a single object) is likely part of a donkey engine (Figure 10). PB-021/022 are two circular iron pieces sticking upright out of the bottom, 4 feet apart, and connected by a shaft that could not be exposed (which is why they were given separate feature numbers). The circular iron pieces are 1 foot 6 inches in diameter. One of them (PB-021) is featureless, while the other (PB-022) is grooved along the edge.

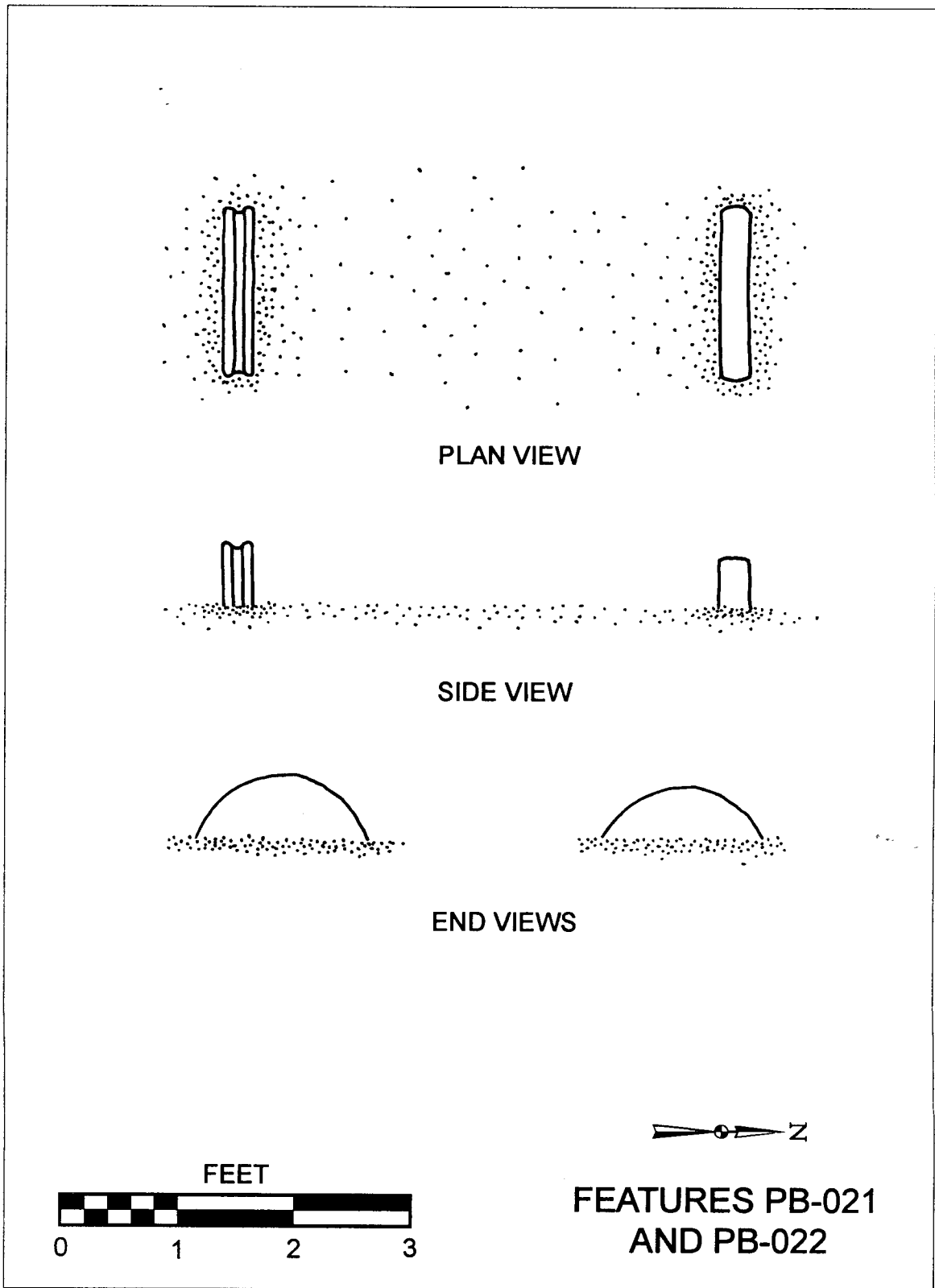


Figure 10

Although positive identification is difficult, it is probably the drive spindle of a steam donkey engine.

Features PB-017, 018, and 023 are all similar objects. PB-017 and PB-018 are iron ring-like objects. PB-017 has an outside diameter of 4 feet 4 inches, an inside diameter of 2 feet 1 inch, with the thickness of the main part of the ring 5 inches. An inner flange adds 2 inches in thickness to either side (Figure 11). PB-018 has an outside diameter of 3 feet, an inside diameter of 2 feet 2 inches, and is 4 inches thick (Figure 12). PB-023 is a solid circular iron object 2 feet 1 1/2 inches in diameter and 4 inches thick (Figure 13). All three features have notched edges. The edges of PB-018 and PB-023 have a gear-like appearance, while the edge of PB-017 has teeth spaced about every 7 inches. The geared edges of PB-018 and PB-023 resemble the purchase rims or pawl rim of a windlass. The 7-inch-spaced teeth of PB-017 resemble a wildcat or cable lifter, which is the portion of a windlass that actually grabs each link of chain, thus pulling in the chain when rotated.

Features PB-026, 027, and 029 are also likely parts to either a windlass or a donkey engine. Both PB-027 (Figure 14) and PB-029 (Figure 15) contain warping hubs and geared mechanisms on shafts, likely parts from a windlass, a deck winch, or a donkey engine. PB-027 is 3 feet 9 inches in length, while PB-029 is 2 feet long. The warping hubs on each one are identical, each 1 foot 4 inches long, and 1

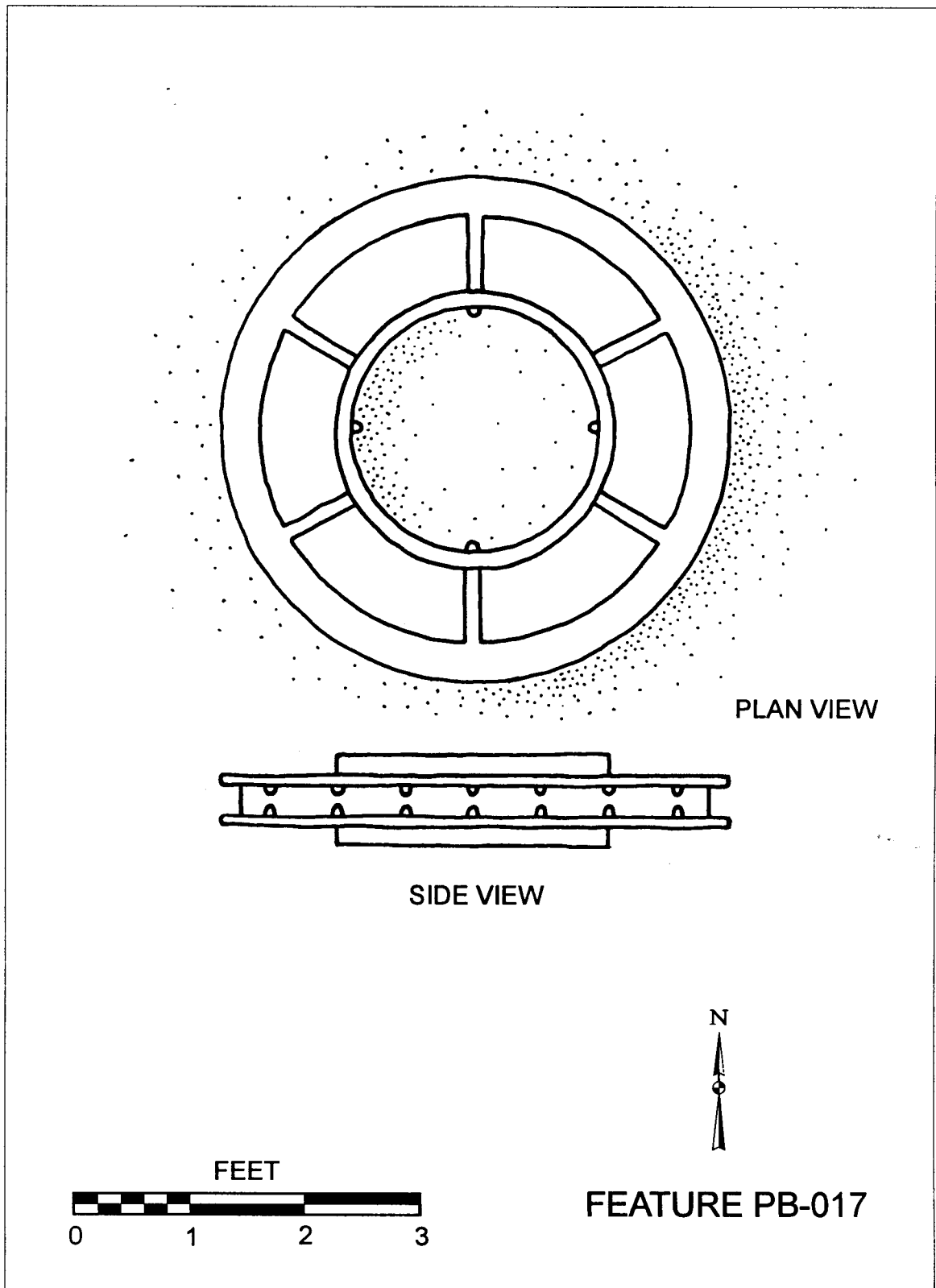


Figure 11

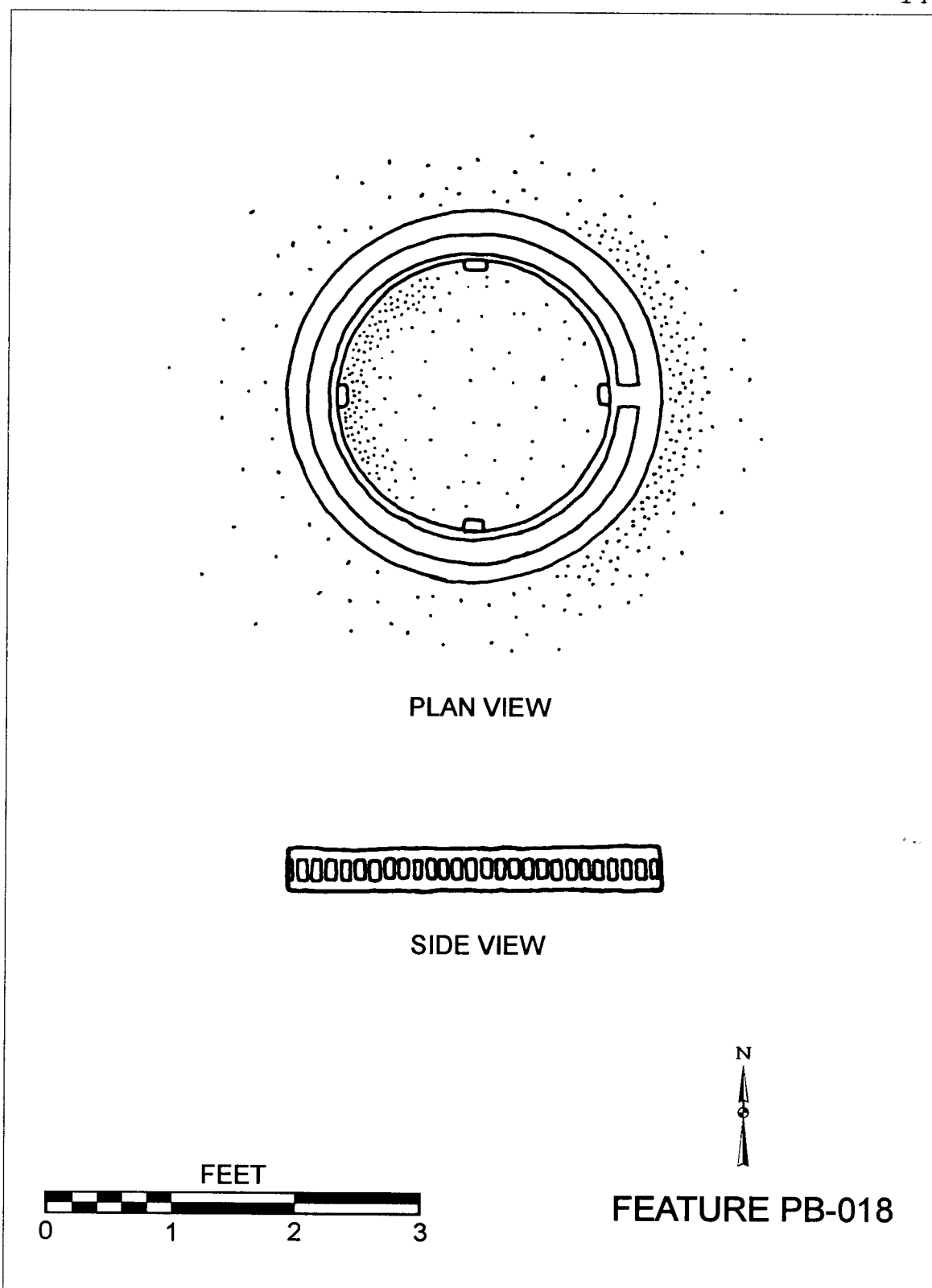


Figure 12

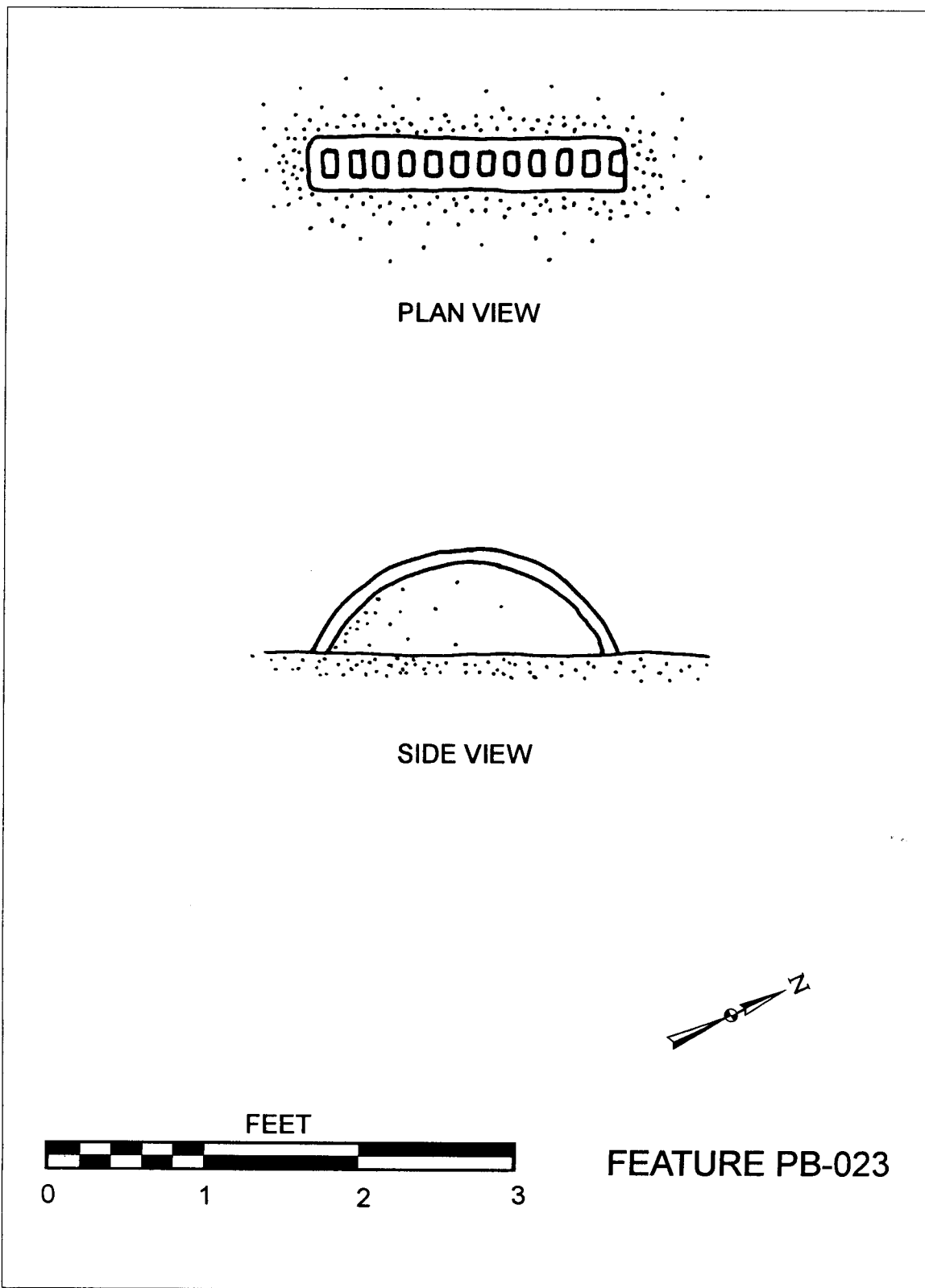
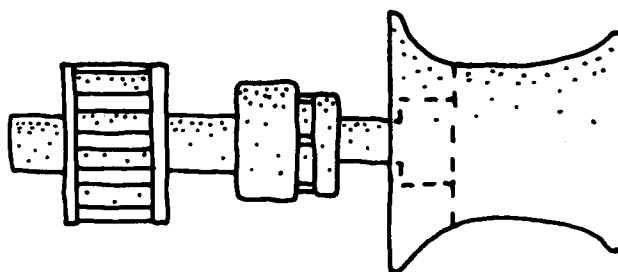
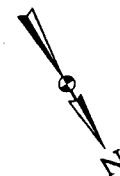


Figure 13



PLAN VIEW

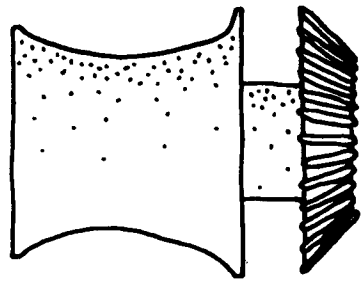
FEATURE PB-027



FEET



Figure 14



PLAN VIEW

FEATURE PB-029

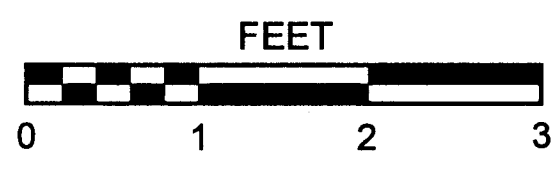
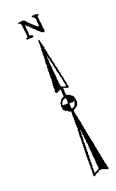
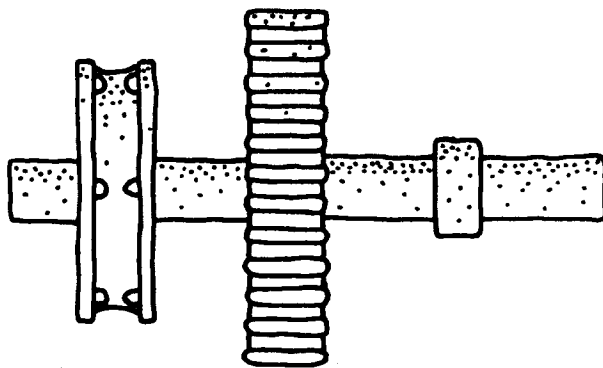


Figure 15

foot in diameter at their narrowest point. Feature PB-026 (Figure 16) has a large, circular geared mechanism 1 foot 10 inches in diameter, and a smaller circular object 1 foot 5 inches in diameter. The teeth on the latter's edge are spaced on 7-inch centers, same as PB-017. This piece also resembles the chain-cable lifter from a windlass.

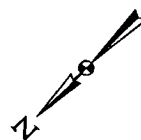
The second most conspicuous feature in the intertidal zone behind the boiler is PB-025, a large, rectangular-shaped iron structure encrusted to the bottom (Figure 17). It has an outside length of 7 feet 2 inches and an outside width of 4 feet 1 inch. The inside length is 6 feet 4 inches, while the inside width is 3 feet 1 inch. The object is 8 inches high. At first glance, the object appears to be some sort of hatch coaming. This is unlikely, however, as the cargo hatches on almost any ocean-going vessel would have been much larger and more probably constructed of wood. Feature PB-025 may be a machinery mount, possibly for the windlass or the donkey engine.

The rest of the intertidal features are indeterminate. They will be described briefly, but no speculation as to what they are or what they were used for will be made. Feature PB-019 is a deteriorated piece of wood that is firmly embedded in the bottom, probably attached through the encrustation of various iron fasteners or fittings. The piece is 4 feet long, 11 inches wide, and possibly 6 inches thick, though this measurement is not reliable because the



PLAN VIEW

FEATURE PB-026



FEET



0 1 2 3

Figure 16

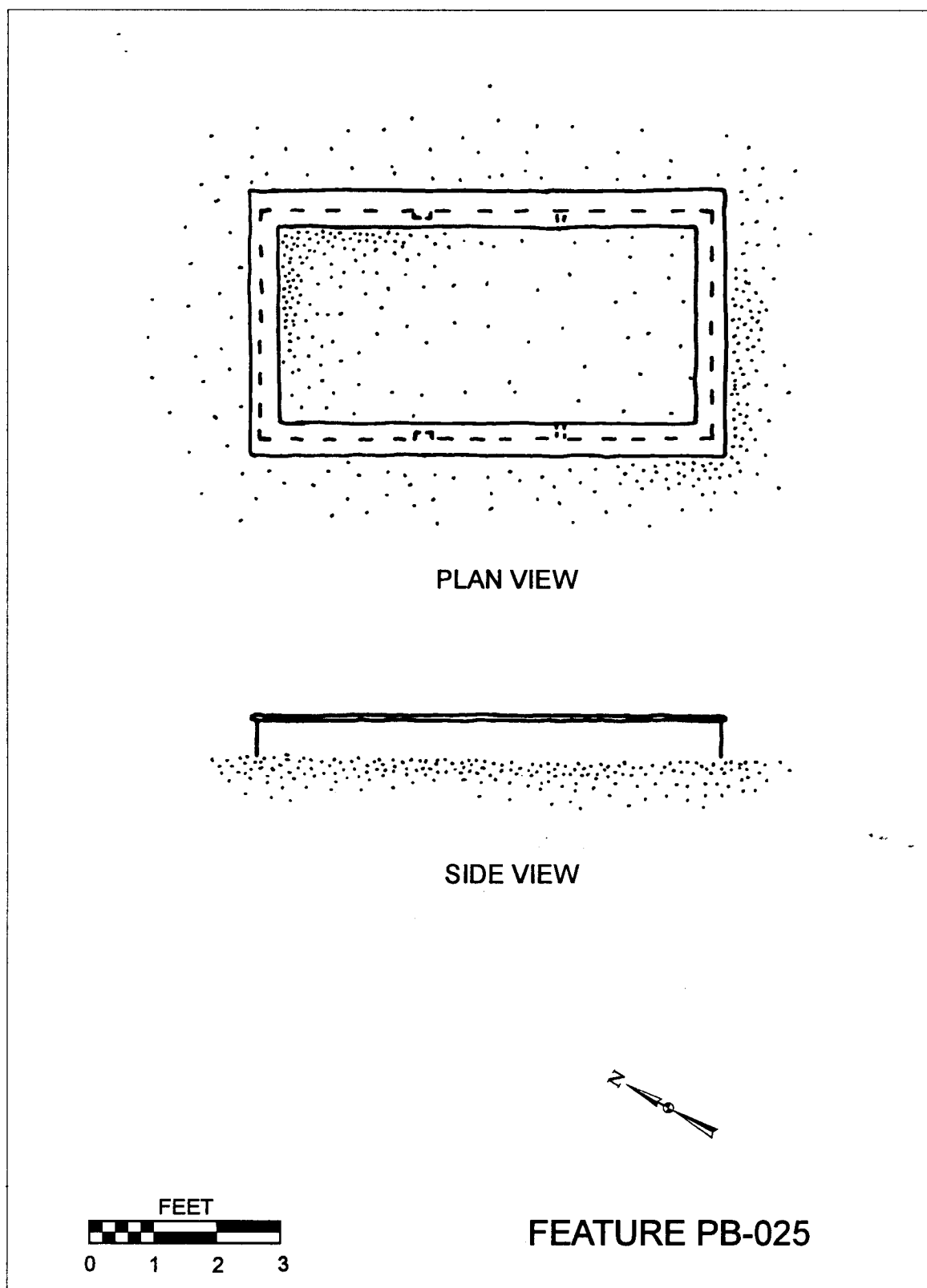


Figure 17

bottom edge of the piece could not be distinguished.

Feature PB-024 is an oddly shaped iron object, with rough dimensions of 1 foot 11 inches by 1 foot 6 inches (Figure 18). The main attribute is a U-shaped piece of iron attached to a base. The object was only drawn in two dimensions because it is encrusted into the bottom with thick marine growth surrounding it.

Feature PB-028 was so heavily encrusted and covered with marine growth that no details could be seen. A scale drawing was not produced. It appeared only as a small ferrous lump.

Feature PB-030 is an iron block 2 feet 4 1/2 inches long, 9 inches wide, and 4 1/2 inches thick (Figure 19). The top (exposed) surface has shallow grooves 1/2 inch wide and 1/2 inch apart running lengthwise for the whole width of the piece.

Feature PB-032 is a group of three iron fasteners concreted onto the rocks. Their lengths are 9 inches, 1 foot, and 1 foot 3 inches. The two shorter ones are approximately 1 inch in diameter, while the longer is about 1 1/2 inches in diameter.

Feature PB-033 is a small, half-moon-shaped iron object (Figure 20). It is 2 feet 1 inch long across its base and just over 9 inches wide at the broadest point. It is 1 1/2 inches thick. The top surface has six shallow grooves running lengthwise. The grooves are 1/2 inch wide with

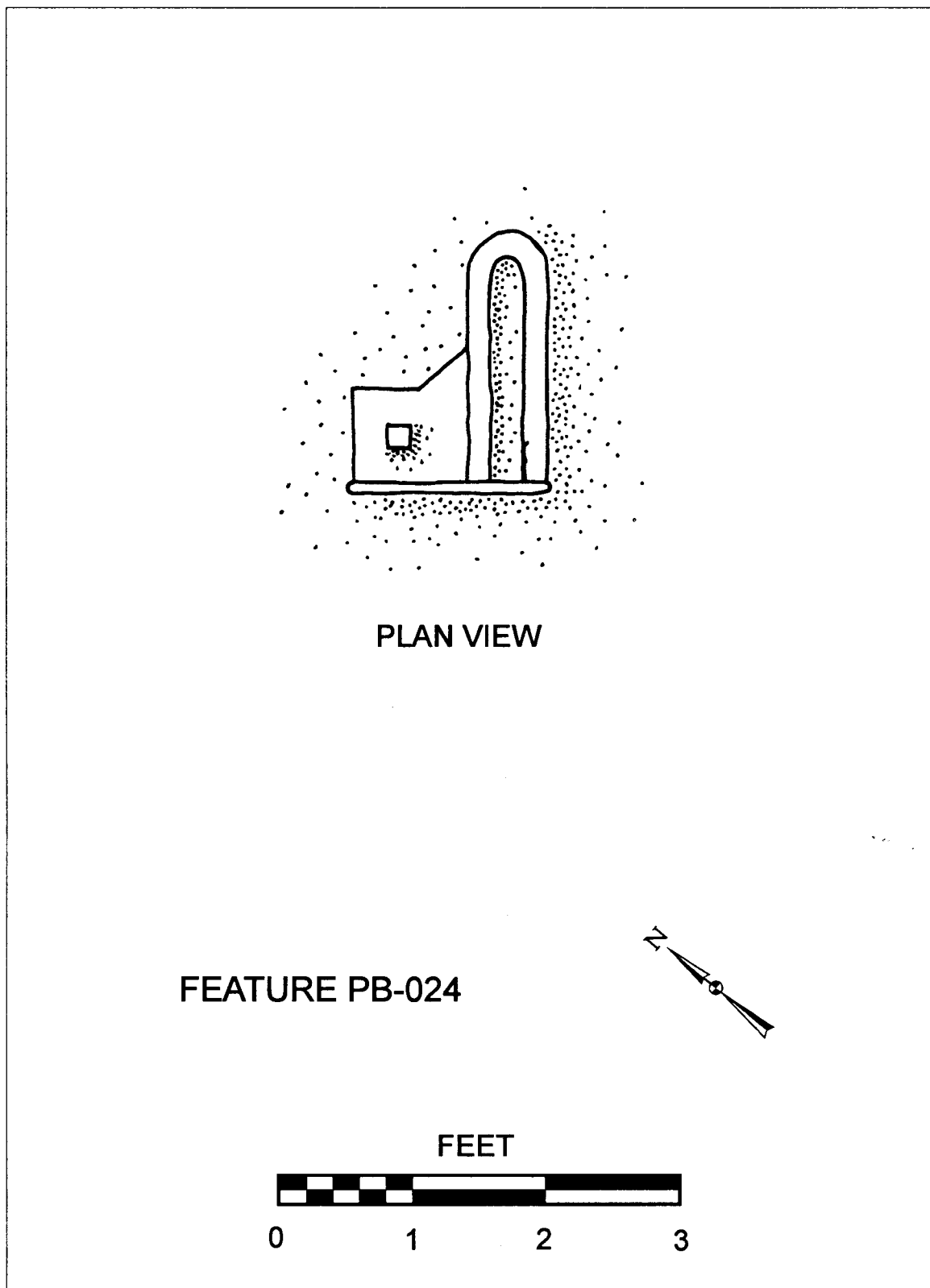


Figure 18

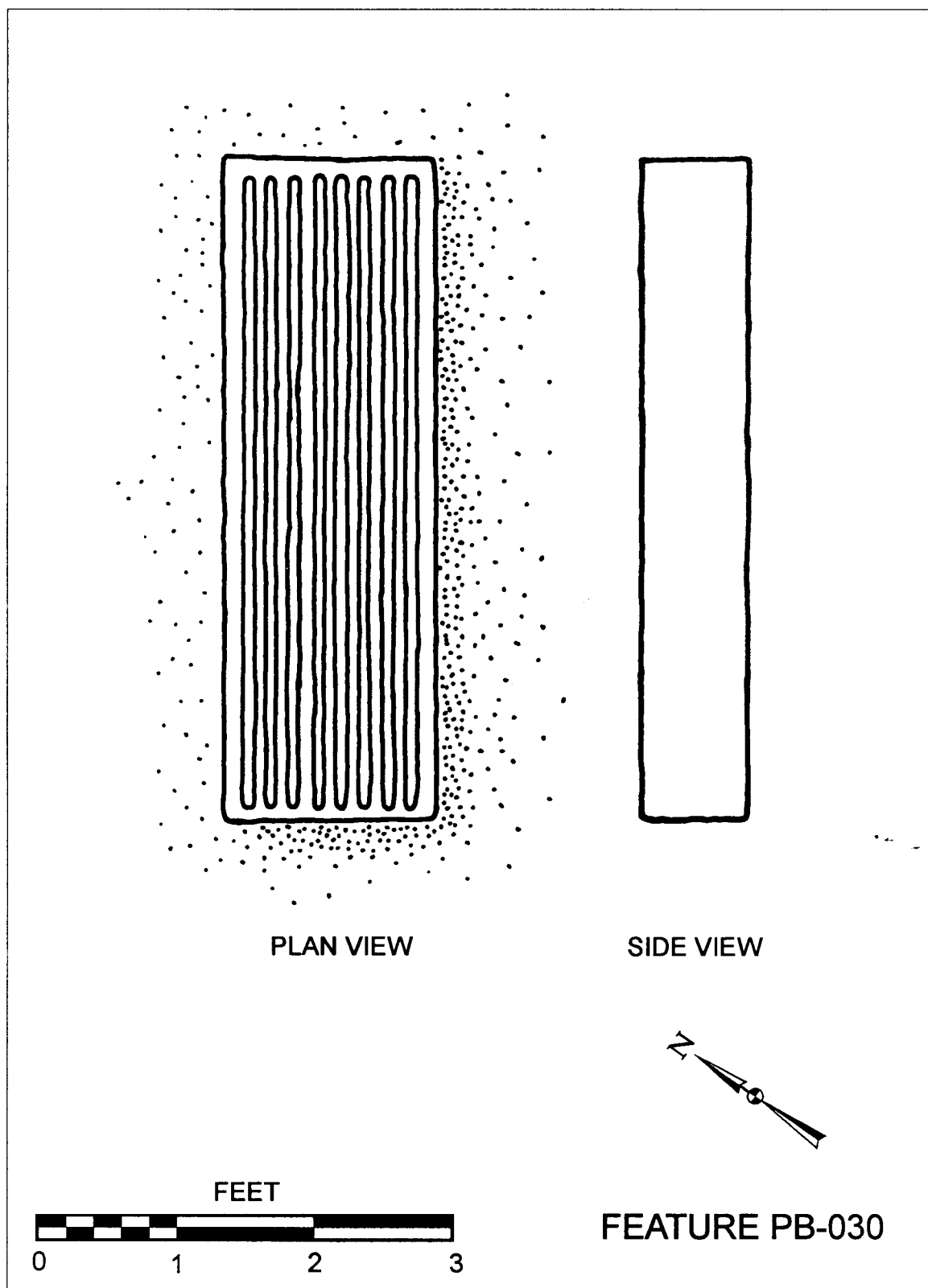


Figure 19

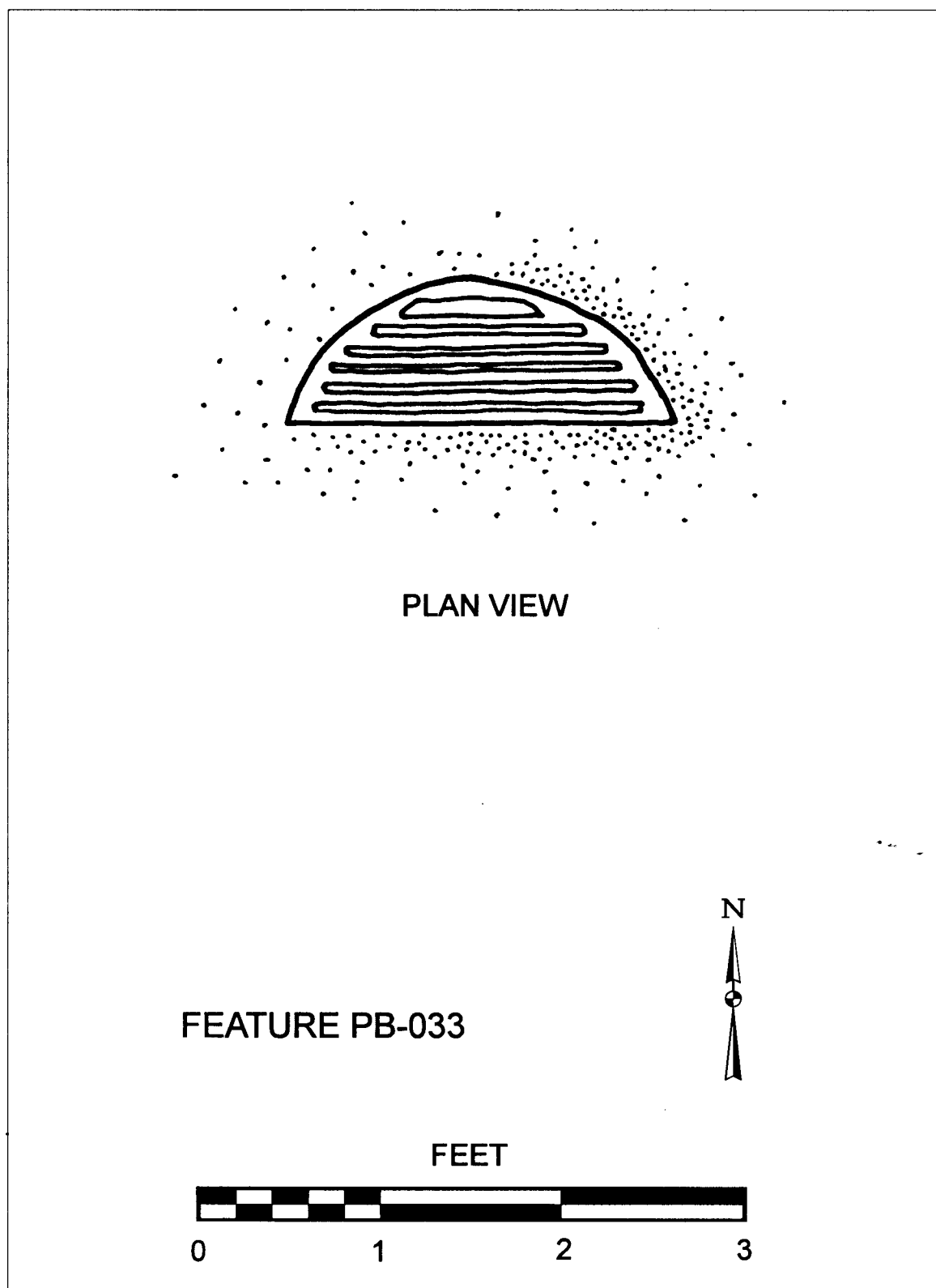


Figure 20

3/4-inch spaces between them. The bottom surface of the object is smooth.

When taken as a whole, the intertidal zone component of the Northwest Cove Site is likely ground tackle elements and bow machinery from an ocean-going vessel. The most diagnostic features, the hawse pipes, belong to a vessel of *J. M. Colman's* size. The donkey boiler, the crosshead mechanism from a pump-brake windlass, and the probable donkey engine/windlass parts are all items expected aboard a typical Pacific coast lumber schooner. Evidence for a single source comes from the fact there are only two hawse pipes and a single representative of each iron object. This means the whole collection was deposited in a single wreck event. Even though several of the features cannot be positively identified, the assemblage taken as a whole is very likely from *J. M. Colman*.

The wooden timbers above the high-tide line in Northwest Cove, Point Bennett present a different case than the intertidal zone material. A determination of association with *J. M. Colman* was based on size and characteristics of the timber, evidence and size of fasteners, and wood species. The species identification was seen as a first-line cut for determination of association. Hall-built schooners were constructed entirely of Douglas fir, with the exception of the stem and stern posts, so any timber on the beach that was not Douglas fir (unless from a

stem or stern post) could not be associated with *J. M. Colman*.

Wood identification was conducted by PaleoResearch Laboratories of Denver, Colorado.⁷ Of the fifteen wooden features recorded at the Northwest Cove Site, all but one, and components of two others, were found to be Douglas fir. Timber PB-013 is *Juglans nigra* (Black walnut). Although the feature is more than 6 feet long and nearly 1 foot square in places, it contained only a single, small iron fastener in one end. This, combined with the wood species, rules out its association with *J. M. Colman*.

Another feature that can be ruled out as coming from a wrecked vessel is PB-005. This feature consists of two timbers, each 5 1/2 inches thick, 17 1/2 inches wide, and 16 feet long held together with two iron fasteners and remnants of a third. The fasteners are 1-inch square and clinched over 3 1/2-inch-round washers or roves. The fasteners also pass through 3-inch-square spacers located between the timbers. Even though the wood is Douglas fir, the feature is not consistent with ship construction of any period, and is more likely from a dock or pier.

The remaining thirteen features are Douglas fir and have fasteners consistent with late-nineteenth-century ship construction. This, however, does not make association with *J. M. Colman* a certainty. After analysis, it was found that only four timbers are possibly structural hull elements from

a vessel the size and age of *J. M. Colman*.

The first, feature PB-001, is a large, Douglas-fir timber measuring 14 feet 10 inches long, with maximum width and height of 23 inches by 21 inches (Figures 21 and 22). Both ends are broken off, so it is impossible to determine the timber's original length. All extant surfaces are badly worn and deteriorated, so the sided and moulded dimensions are approximate. The timber's most conspicuous characteristics are the size and number of iron fasteners. There are six large, iron drift pins driven through and protruding from the side. These drifts are approximately 1 1/2 inches in diameter (though exfoliating badly) and range in length from 2 feet 2 inches (broken) to 4 feet 2 inches long. They are spaced an average of 2 feet apart. There are also nine 1-inch diameter iron drifts and five spikes 1/2-inch square protruding from the timber's top surface. All are broken off close to the surface.

The timber's size and fasteners make it likely this feature is a structural element from an ocean-going vessel. Furthermore, because of the timber's large size and configuration of the iron fasteners, it is most likely PB-001 is a portion of a vessel's centerline structure. The lack of rabbet, fasteners driven through both axis of the piece, and the observation that the large drifts were first driven through this piece and then, probably, into another makes it impossible for this piece to be a portion of a

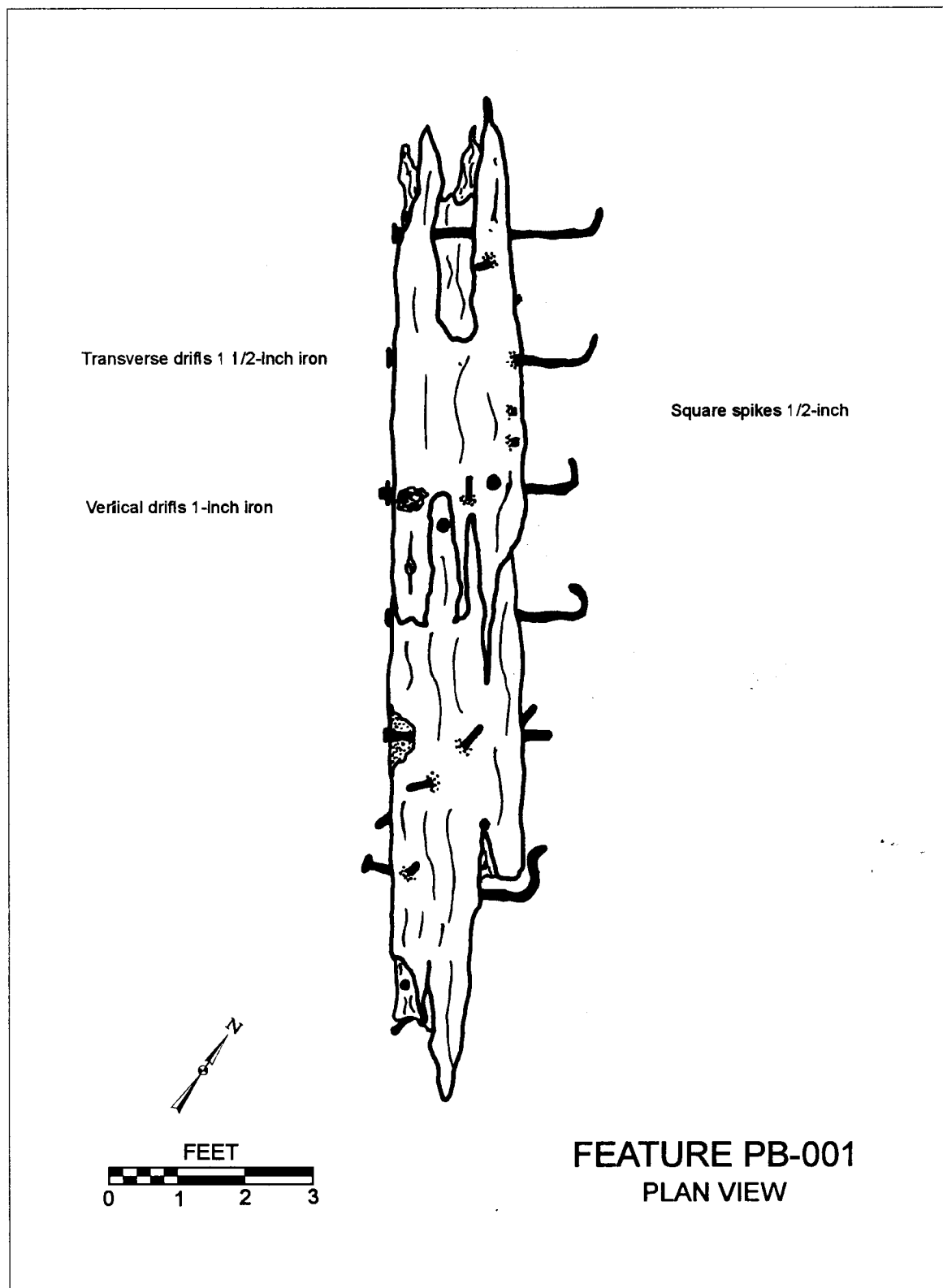


Figure 21

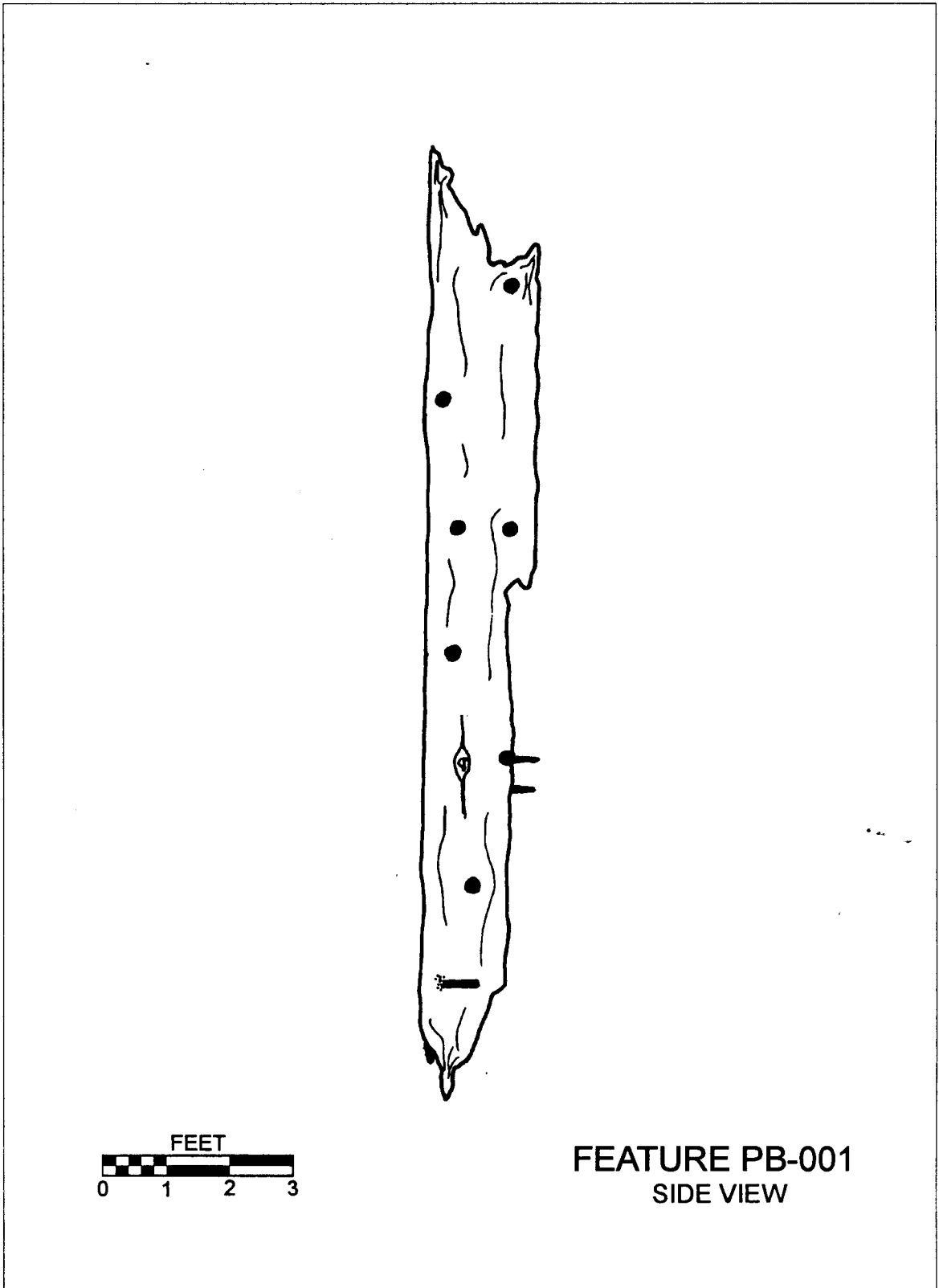


Figure 22

keel. On the other hand, these same characteristics make it probable that PB-001 is a piece of either a main, sister, rider, or assistant keelson, which now rests on its moulded face. The timber's western face, from which the large iron drifts were driven, is likely the top, or sided, surface. If this is a piece of the main keelson, then the six 1 1/2-inch diameter drifts were probably driven through this piece, through the floors, and into the vessel's keel. If it is from a sister keelson, then the large drifts were probably driven through this timber into the floors or first futtock of the vessel. If this timber is from a rider or assistant keelson, then the large iron fasteners were probably driven through the piece into the main or sister keelson. In all cases, the 1-inch diameter fasteners driven through the opposite axis of the timber probably edge-bolted this timber to its adjacent keelson component, indicating multiple keelson elements.

Because *J. M. Colman's* original contract could not be located, it is impossible to verify on the basis of scantling dimensions whether this feature is a keelson portion from that vessel.

A comparison between the scantlings of *Comet* and the *Rules for the Construction of Wooden Vessels* offers a clue, however, as to whether association with *J. M. Colman* is likely. *Comet*, which had a gross tonnage of 429 compared to 463 for *J. M. Colman*, was built with a 16-inch by 20-inch

main keelson, and a 14-inch by 18-inch sister keelson.⁸ Because *J. M. Colman*, the second largest three-masted schooner built on the Pacific coast, was larger than *Comet*, the centerline structure would also be larger. Therefore, scantling dimensions of approximately 21 inches by 23 inches for one of the keelson components is reasonable for *J. M. Colman*. The *Rules for the Construction of Wooden Vessels* published by the American Shipmaster's Association (later the American Bureau of Shipping) for the year 1879 required a vessel of 400 gross tons to have a keelson and riders measuring approximately 13 inches by 32 inches.⁹ These rules were intended as a minimum standard for insurance evaluation purposes and allowed differing dimensions as long the alteration did not lessen the strength of the structure as a whole.¹⁰ By comparing *Comet's* keelson dimensions to the rules, it can be seen that the Hall Brothers did alter their timber measurements. The rules cannot, therefore, be used as the sole determinate for possible scantling dimensions of *J. M. Colman*, but are most helpful to separate likely components of these vessels.

Comet's contract specifies that iron fastenings 1 1/4 or 1 1/8 inches in diameter be used to fasten the keelson. Because *J. M. Colman* was larger than *Comet*, 1 1/2-inch iron drifts to fasten the keelson would be expected. Another possibility is that the expansion caused by the corrosion process of the iron fasteners made the 1 1/2-inch

measurement larger than the original diameter. In either case, these fasteners reflect probable association with *J. M. Colman*.

I observed during this analysis that the wood around the large fasteners on the east face of the timber is considerably more worn than the rest of the surface. There is no obvious explanation for this disparity. It is possible that this differential weathering is a function of the natural deterioration process of the Douglas fir caused by exposure over eighty to ninety years, and is not significant archaeologically. On the other hand, it is also possible that this deterioration took place while the vessel was still in use. If the latter is the case, this wear might be an archaeological signature of extended use and age of the vessel from which this timber came. Differential weathering of Douglas fir around iron fasteners is not historically documented. As discussed in Chapter III, Hopkins (1874) noted that Douglas fir held iron fasteners with tenacity, that the iron would break before it could be withdrawn from the timber, and that iron did not deteriorate in fir as it did in oak.¹¹ There is no mention of a problem with fir breaking down over time around iron fasteners, although even if this was known, it is unlikely it would be noted in a paper advocating the use of fir as a shipbuilding material. On the other hand, classification rules specify fewer years of use for pine and fir than oak. Further study

and comparisons to other examples are necessary to test the validity of this observation.

In light of this analysis, it is possible to identify feature PB-001 as a keelson component from a late-nineteenth-century, ocean-going vessel of between 400 and 500 gross tons, most likely *J. M. Colman* because of historical documentation.

Another feature that is likely a scantling piece from a large, ocean-going vessel is PB-002 (Figures 23 and 24). This feature consists of three wooden components: two long, rectangular pieces, one on top of the other, and a small trapezoidal piece fastened to the bottom timber. Also present are numerous iron fasteners. The bottom timber's total length is 19 feet 8 inches, it is 1 foot 2 inches wide and 8 inches thick. This piece contains four mortises cut into its west side, which measure between 10 inches and 1 foot 1 inch long, 3 1/2 inches high, and 5 1/2 inches deep. The mortises are indented about 1 1/2 inches from the side. The top timber, which was originally fastened to the bottom piece with eight 1 1/4-inch diameter iron drift pins spaced 2 feet on center, is 15 feet 6 inches long, 8 inches wide, and 4 inches thick. On the feature's north end, a trapezoidal piece 2 feet 2 inches long, 1 foot 7 3/4 inches wide, and 8 inches thick is fastened to the lower timber with five iron, 1-inch diameter drift pins. In addition to these fasteners, the feature also has two pairs of

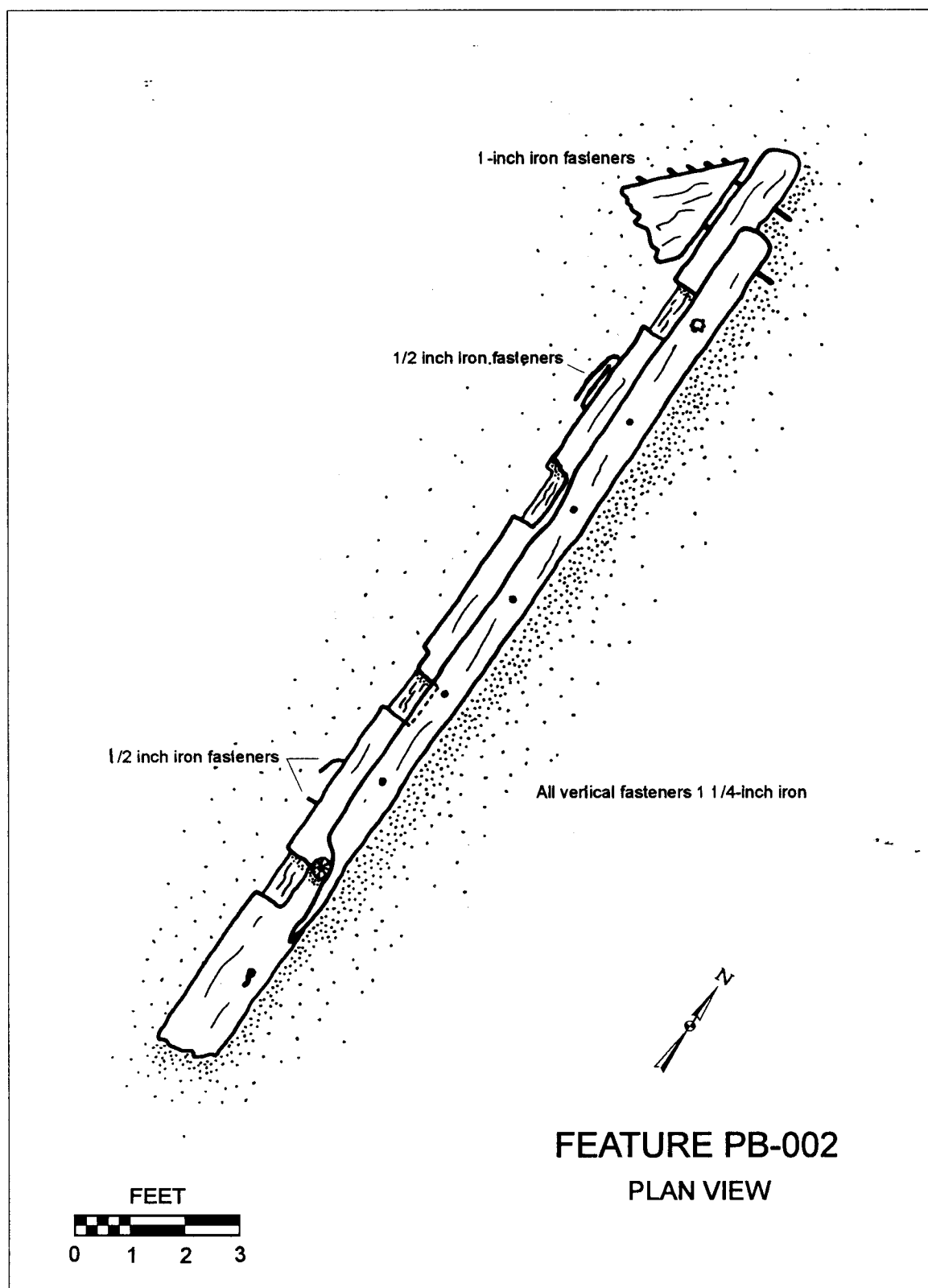
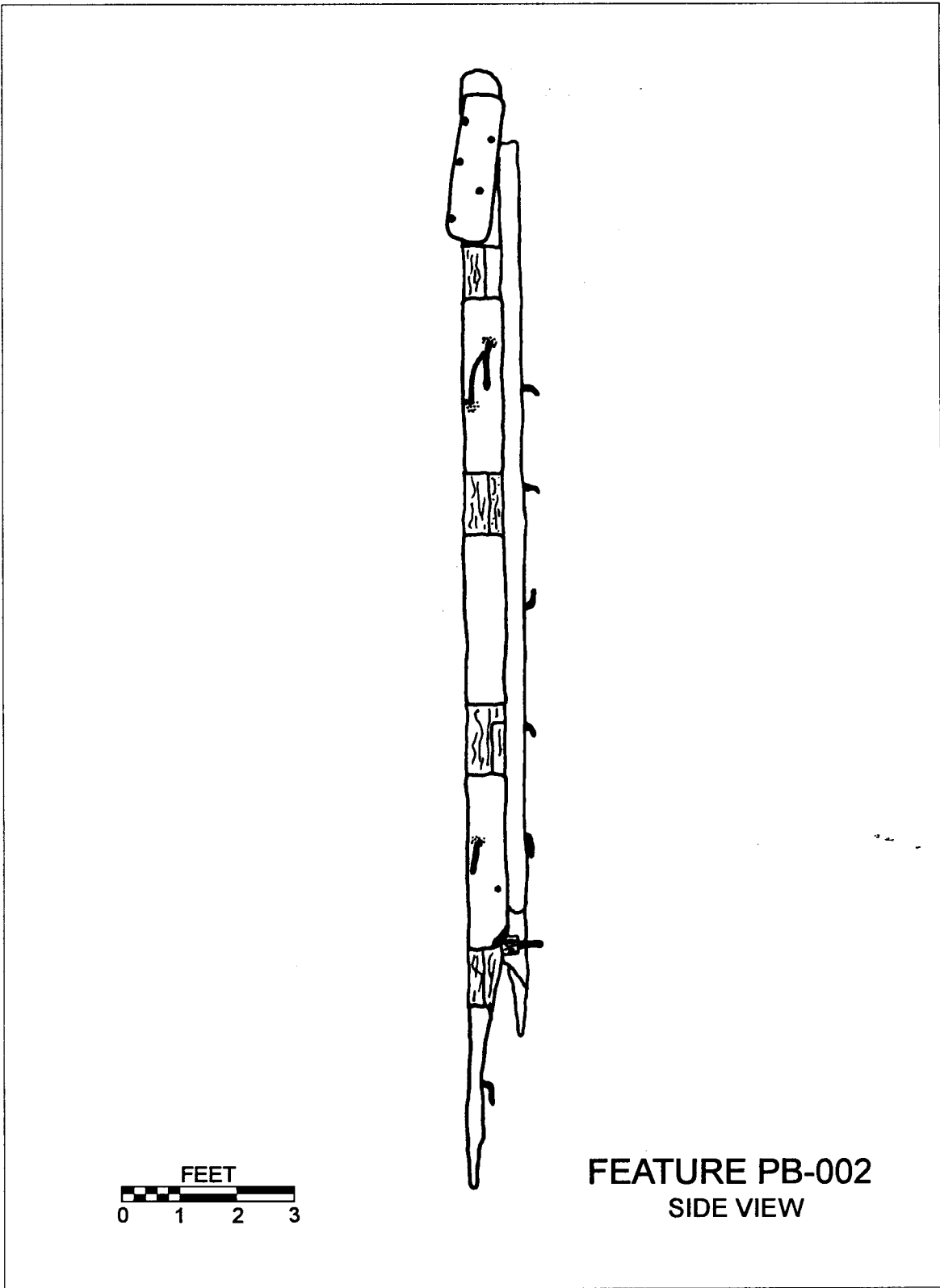


Figure 23



FEATURE PB-002
SIDE VIEW

Figure 24

additional 1/2-inch diameter drifts in its west face.

Attributes of this feature suggest an identification as a deck clamp or shelf. The mortises, spaced on 4-foot centers, would have received the deck beam ends. Deck beam spacing corresponded to frame spacing, so that the end of each deck beam rested against a frame.¹² Generally, a vessel framed on 2-foot centers would have a deck beam for every other frame, with deck beam spacing not exceeding 5 feet.¹³ The trapezoidal piece was a reinforcing chock, butted between the clamp and the deck beam.

There are several problems with this interpretation, however, and several questions to be answered before it can be wholly accepted. First, the mortises extend only about half the width of the bottom timber. Normally, the deck beam rests on the full width of the clamp, not just half. Second, a main-deck clamp would have been firmly fastened to the vessel's frames with large through-bolts driven from the outside and clinched.¹⁴ There is no evidence of any large fasteners or holes coming through the bottom timber transversely. Third, between the mortises, evidence of more reinforcing pieces like that found on the end of the feature would be expected. However, there are only two pairs of 1/2-inch fasteners, nothing like the five 1-inch drifts that fastened the first reinforcing piece to the bottom timber.

Finally, one of the most puzzling aspects of this feature is that at least two of the vertical 1 1/4-inch

fasteners joining the top timber to the bottom timber are driven through oak plugs. Only two could be examined, so it is possible that the remaining fasteners were also driven through plugs. Research into this practice has been inconclusive. It is not known if this represents an effort to strengthen the bonding of these two timbers, or if this is evidence of a repair meant to replace a corroded fastener or possibly to augment wood that had deteriorated around the fastener. This may represent a peculiar and undocumented practice of the Hall Brothers. Identification as a portion of a deck clamp or shelf should be viewed as tenuous, especially when considering association with *J. M. Colman*.

Features PB-011 and PB-014, constructed in the same manner, likely represent pieces of a wooden hatch coaming (Figures 25 and 26). The two features each have three layers of timbers, fastened together with 1/2-inch diameter, round iron fasteners. Originally, the structure was either U-shaped or, more likely, rectangular with rounded corners. PB-011 is sitting upright, with the three layers stacked, while PB-014 is laying face-down with the three layers side by side.

Feature PB-011's bottom timber is 6 1/2 inches thick, the middle timber is 5 inches thick, and the top timber is 7 inches thick, giving PB-011 a total height of 18 1/2 inches. Each of the timbers is 1 foot wide. Feature PB-011 is roughly L-shaped, with the longest side 11 feet long, and

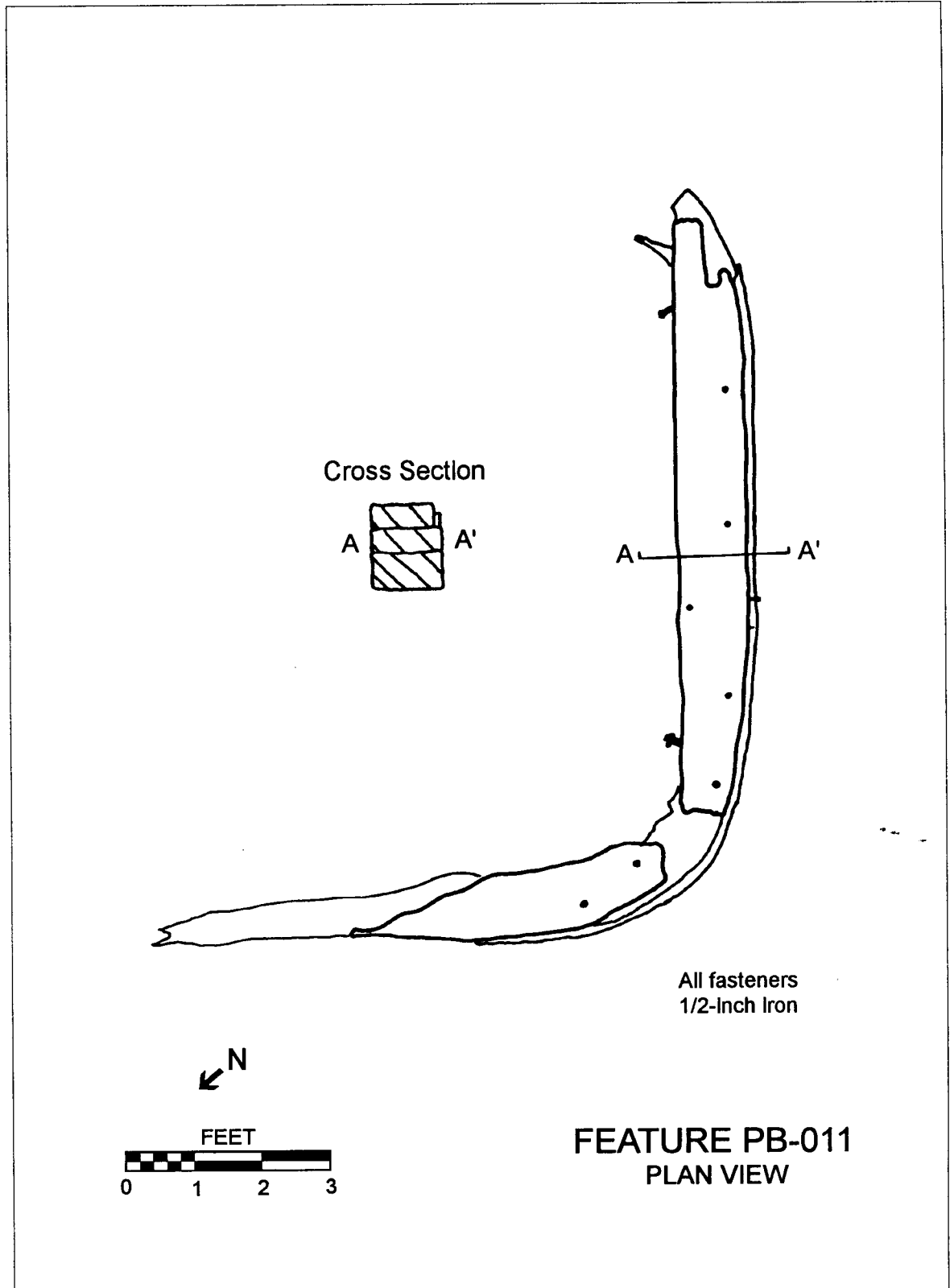


Figure 25

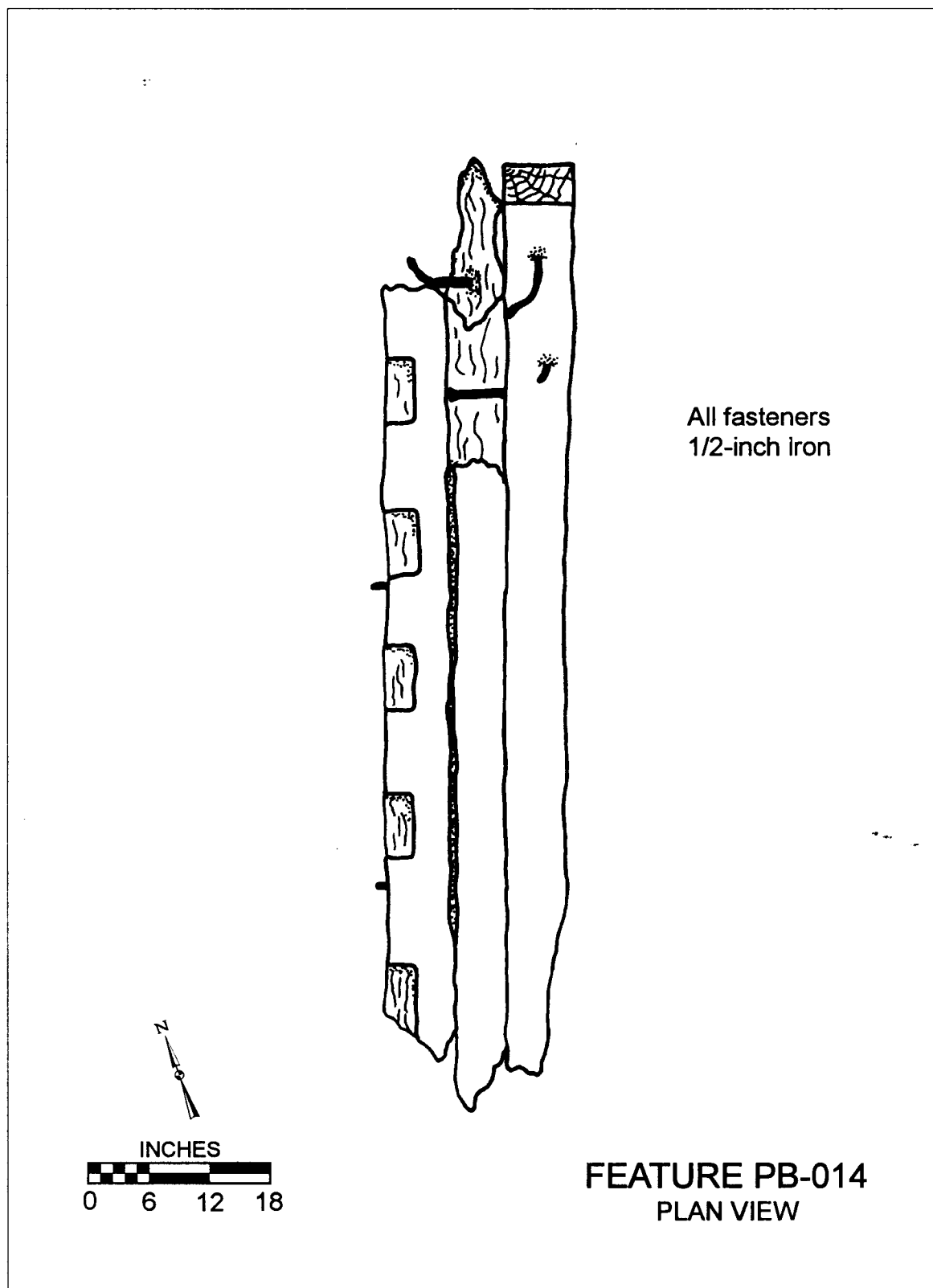


Figure 26

the shorter 8 feet long; both ends are broken. The end of the longer side exhibits the beginning of a curve before the fracture. Feature PB-014 shows the beginning of a curve on one end before it is broken off, as well. In the one intact curve on PB-011, the two timbers forming the bottom layer meet in the middle of the curve. The timbers of the two top layers, on the other hand, are joined in the curve by a chock. Feature PB-014 has shallow mortises along what would be the inside edge of the top timber, if it were standing upright. These mortises are 6 inches long, 3 inches wide, with a maximum depth of 1 1/2 inches. The shorter length of PB-011 exhibits identical mortises on its inside face, suggesting that PB-014 was originally connected to PB-011 opposite of the shorter length.

Each layer of wood on feature PB-011 is faced on the outside edge with thin, horizontal planks 1 1/4 inches thick. These are nailed to the main timbers with 1/4-inch round nails. Wood species analysis identified these planks as *Quercus virginiana* or live oak. The main timbers were, of course, Douglas fir. It could not be determined if PB-014 included similar planks because the face they would have been attached to was face-down. The plank nailed to the top layer of PB-011 is only 4 1/4 inches wide, so it extends only about half the thickness of that timber. This, in effect, leaves a 2 3/4-inch deep, 1 1/4-inch wide rabbet around the outside of the structure's top face.

Positive identification of these pieces is difficult, but evidence suggests they could be from a hatch coaming, or the coaming to a deck structure, of a large vessel. Both hatch and house coamings resembling this structure are depicted in W. H. Curtis *The Elements of Wood Ship Construction* (1919).¹⁵ There is both evidence to support this speculation, and problems with these possibilities, as well. In addition to the similarity to the structures depicted in Curtis, the mortises cut into the top, inside edge of PB-014 and the shorter length of PB-011 support the possibility of the structure being a hatch coaming. Hatch coamings contained a number of removable beams that criss-crossed the opening of the coaming. These beams, the transverse ones called strongbacks and the longitudinal ones called, simply, fore-and-aft beams, supported the hatch cover. These supports were necessary because the hatch cover had to support a great weight of deck cargo, particularly on lumber schooners where so much of the cargo was carried on deck. These beams were supported on their ends by mortises cut into the coaming. One problem with this identification is that the hatch coaming would be securely fastened to the hatch framing with closely spaced, large, iron through-bolts.¹⁶ PB-011 has only five 1/2-inch diameter vertical fasteners along its entire 11-foot length. It is possible, however, that either the lowest or the lower two layers were securely fastened to the hatch framing, and

then the top layer fastened to them, thereby hiding the large through-bolts.

There is also support for this structure being a deck-house coaming. These coamings contained a shallow rabbet around the outside top edge to receive the first plank of the house siding. The outside planking on PB-011 forms such a rabbet. This supposition also has a problem. If this was a deck-house coaming, then the top surface should have a series of mortises cut into it (not like the mortises cut into the inside edges) to receive the studs that supported the house walls. The top surface of PB-011 displays no such mortises.

If these structures represent a coaming from *J. M. Colman*, then it is probably not a house coaming. Unfortunately, non-structural elements such as these are not specified for by either *Comet's* contract or the *Rules for the Construction of Wooden Vessels*. If, however, we can use *C. A. Thayer*, a lumber schooner preserved at San Francisco National Maritime Historical Park, as a model, it can be seen that the deck houses would have been larger than the structure represented by PB-011 and PB-014. The after deck house of *C. A. Thayer* measures approximately 22 feet wide by 20 feet long, while the forward deck house measures about 16 feet wide by 35 feet long. Since *C. A. Thayer* is narrower than the 37-foot beam of *J. M. Colman*, it is likely that *J. M. Colman's* deck structures would have been slightly wider

than *C. A. Thayer's*.

The original dimensions of the structure represented by PB-011 and -014 was about 11 feet long by 8 feet wide. This is too small to be a deck house coaming or main hatch coaming, which measures about 21 feet by 12 feet on *C. A. Thayer*. Although the main-deck arrangement of *J. M. Colman* is not known, *C. A. Thayer* has an additional small cargo hatch forward of the main hatch, though aft of the forward deck-house, which measures about 12 feet wide by 9 feet long. Therefore, the most likely interpretation is that the structure represented by PB-011 and PB-014 is part of the forward hatch coaming from *J. M. Colman*.

As a whole, analysis of the remaining nine features remains inconclusive. The only certainty about these features is that they are too light to be structural members of *J. M. Colman*. If any of these remaining nine features are from *J. M. Colman*, then they are non-structural elements. All nine are Douglas fir, all exhibit characteristics possibly from a late-nineteenth-century, ocean-going vessel, and yet all nine could just as easily be from a pier, fence, or some other origin. The fact that all, undoubtedly, could have floated to their present location makes their association with a vessel wrecked on Point Bennett tenuous.

Features PB-003, 004, and 015 are all similar, plank-like features, though both the dimensions and fastener size

are too small for *J. M. Colman*. PB-003 is 11 feet 11 inches long, 11 3/4 inches wide, and 3 3/4 inches thick. Both ends have been broken off, so the original length is unknown. One end contains a 3/4-inch threaded nut and bolt, and two 1/2-inch square spikes. This is the only evidence of fasteners in the feature. PB-004 is 11 feet 9 inches long, 1 foot wide at its maximum width, and 1 1/2 inches thick. It contains eight 1/2-inch square, iron spikes and the empty hole of a ninth. These spikes are paired and spaced between 2 to 3 feet apart. Finally, PB-015 is 20 feet long, 11 inches wide, and 2 1/2 inches thick. It contains thirteen 1/2-inch square spikes, spaced an average of 18 inches apart and alternating from side-to-side on the plank.

At first glance, these features appear to represent either ceiling, outer hull, or deck planking from a vessel similar to *J. M. Colman*. Further analysis, however, eliminated all of these as possibilities. Again using *Comet's* contract as a guide, this conclusion is quite evident. The ceiling planking for *Comet* was 4 inches thick to the turn of the bilge, and from there to the deck clamp between 8 and 10 inches thick.¹⁷ The outer hull planking was approximately 4 inches thick, the main deck was made up of 4-inch by 4-inch planks, and the housetops were 3-inch by 3-inch planks.¹⁸ Widths were not specified for either the ceiling or hull planking. Although thicknesses of PB-003 and PB-015 are consistent with either ceiling or hull

planking, the most incontrovertible evidence against this identification are the fasteners specified for these elements in *Comet's* contract and construction rules. Ceiling planking was to be fastened with 7/8-inch iron fasteners driven from the outside of every frame. This means that the fasteners would be nearly 1 1/2 feet long and spaced just over 2 feet apart. The outer hull planking was fastened with composition spikes and 1 1/4-inch treenails on every frame. Frames were spaced on 29-inch centers, so there should be a sizable number of fasteners in every plank. Based on this analysis, PB-003, 004, and 015 are not ceiling, hull, or deck planking from *J. M. Colman*. It is therefore most likely that these features are either non-structural elements (possibly bulwark planking or house siding) from an ocean-going vessel; pieces from a much smaller vessel than *J. M. Colman*; or from something totally unrelated, like a mainland dock or fence, which would very likely be constructed of Douglas fir because of its availability.

The remaining features, PB-006, 007, 008, 009, 010, and 012 are impossible to identify, much less determine whether they came from *J. M. Colman*. All are Douglas fir and all contain some iron fasteners, but they are so badly deteriorated that identification is impossible. It should be reiterated, however, that none are structural elements, based on the timber size and the small size and relatively

few iron fasteners in each.

As mentioned earlier, a single, unidentified iron piece, feature PB-035, was recorded above the high-tide line at Northwest Cove (Figure 27). This feature is a 4 foot 8 inch long, 1 3/4-inch square iron bar, which ends in a 2-inch diameter, 10-inch long round portion. Connected to the bottom of the round end is a 1 foot 3 inch by 3 1/2-inch rectangular piece, so that the whole object forms a "T." This rectangular piece has four 1/2-inch square spikes through it. This object has not been identified.

All in all, the collection of wooden wreckage found above the high-tide line in Northwest Cove does not offer the same degree of confidence of association as the iron material in the intertidal zone. Of the fifteen wooden pieces, only one is definitely from a large, wooden vessel, with three others possibilities. The rest offer few diagnostic clues.

If these features came from *J. M. Colman*, however, the obvious question remains, where is the rest of the ship? With only one small structural member present, the majority of the hull is missing. It can only be assumed that the vessel broke up after its stranding through the high energy environment of Point Bennett or was scattered in salvage attempts. What is left offers only a glimpse of what may have been *J. M. Colman's* remains.

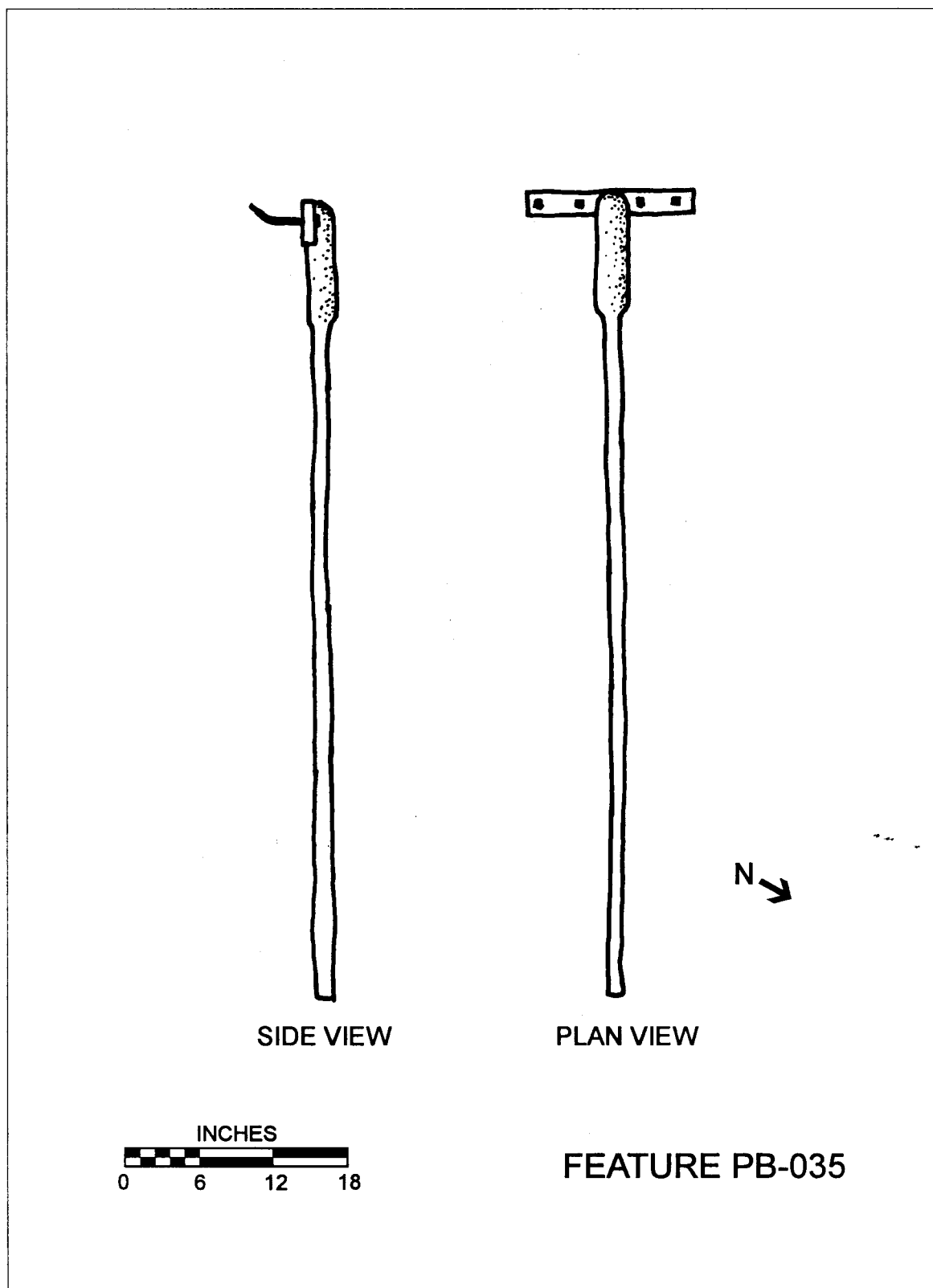


Figure 27

Cluster Point Site

Analysis of the Cluster Point Site (Figure 28) was conducted in the same manner as was the Northwest Cove Site. The twenty-two timbers are individually discussed on the basis of size, shape, and fasteners present, and speculation offered as to their nature and association with *Dora Bluhm*. Unlike the case at Northwest Cove, this process was expedited through scantling dimensions supplied in the surviving contract for *Dora Bluhm*.

Previous research by Channel Islands National Park archaeologist Don Morris identified several features of a wooden sailing vessel that no longer exist at the site. Two of these features may have been removed by the ocean, while the third was definitely removed by humans. While all three features were undoubtedly from a wooden sailing vessel of construction consistent with late-nineteenth-century practices, an association with *Dora Bluhm* remains inconclusive.

The first feature is an iron mast-band with an internal diameter of 21 1/2 inches. It is composed of two half-bands connected by a horizontal iron belt on each side, and possibly represents the half-bands that supported the futtock shrouds near the mast top, below the trestle tree. The size matches the mizzenmast diameter of *Dora Bluhm*, as stated in the original contract.¹⁹ Although this feature is probably from *Dora Bluhm*, there is a chance that it was

carried to Cluster Point attached to a mast from some other shipwreck. This item was located by Morris in March 1990 at a cattle rancher's line camp on the bluff above the beach, just south of Cluster Point. At that time it was being used as a fire ring, and it has since disappeared.

The second feature is an iron hawse pipe measuring 3 feet 5 inches in length, with an external diameter of 9 1/2 inches. It was located in the rocks to the south of Cluster Point and could not be relocated during the present study. According to the tables found in Desmond (1919), a vessel of 300 tons (*Dora Bluhm* registered 330 gross and 315 net tons) required a hawse pipe measuring 11 1/2 inches in diameter.²⁰ This hawse pipe appears to be more appropriate for a vessel of approximately 150 tons.²¹ This does not discount association with *Dora Bluhm*. It has already been demonstrated that dimensions were sometimes altered from published rules, as long as overall strength was not compromised. Unfortunately, there is no way to be certain whether this hawse pipe is from *Dora Bluhm* or not.

The third feature has been identified as the top of a rudder stock, which bears the yoke that attached it to a diamond-cut-screw steering gear.²² It consists of a worn wooden piece 12 inches in diameter clamped into an iron yoke, which is 10 inches wide. The iron yoke is composed of halves, connected by two iron fasteners on each side. Although there is no size comparison available on an element

like this, there are two pieces of evidence that support a *Dora Bluhm* association. First, the original contract for this schooner states that it was equipped with a diamond-cut-screw steering gear.²³ Second, although not sampled for species identification, field observations by Morris indicate that the wooden portion of the feature, the top of the rudder stock, was hardwood, possibly oak. *Dora Bluhm's* contract specifies that one of the few parts to be constructed of hardwood was the rudder post.²⁴ These two clues make this feature's association with *Dora Bluhm* likely. Unfortunately, this feature disappeared from the beach shortly after it was recorded in October 1988.

The remaining analysis focuses on features recorded during this study. All twenty-two timbers analyzed and sampled were found to be Douglas fir, so none could be discounted immediately, as with the Northwest Cove Site.²⁵ One timber, however, feature CP-009 (Figure 29), has a wooden component identified as a member of the Fabaceae family, probably ironwood.²⁶ This is not a wood usually used in ship construction. The ironwood pieces are two narrow planks 3 feet 2 inches long, 3 1/2 inches wide, and 3 1/2 inches thick, which are fastened to either side of a large, extremely deteriorated Douglas fir timber measuring 14 feet 8 inches by 17 inches by 16 inches. As the timber lies in the sand, the ironwood planks are fastened along the bottom edge, on the western end. Each piece is fastened by

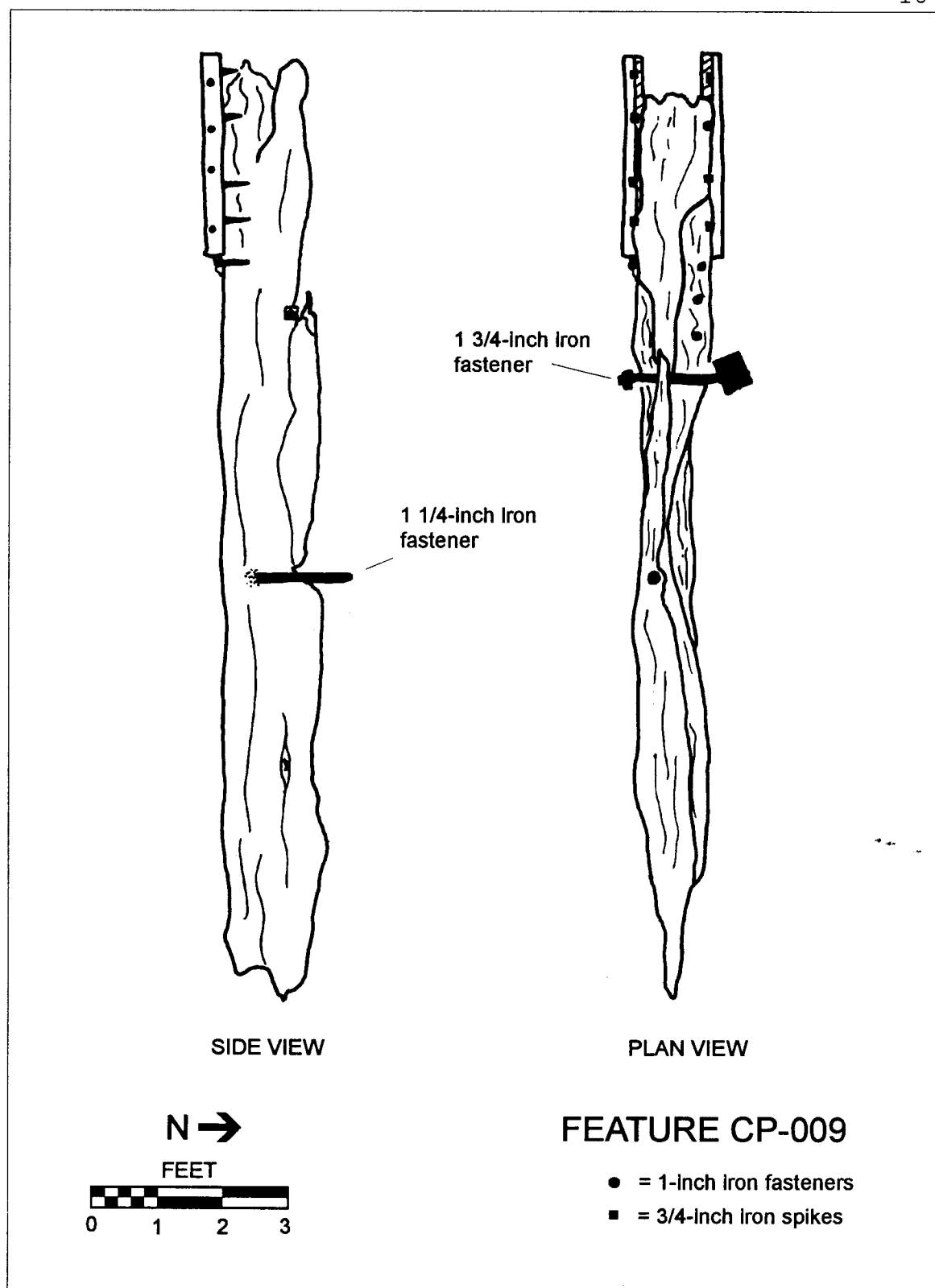


Figure 29

four horizontal spikes, driven from the outside face and four vertical spikes, driven from the bottom. Each iron spike is countersunk into the ironwood, and plugged with an ironwood plug. The main Douglas fir timber contains four vertical 1-inch diameter drift pins, which are grouped near the ironwood planks; one 7/8-inch square spike; one 1 1/4-inch diameter vertical drift pin; and one horizontal 1 3/4-inch diameter bolt, with a 1 3/4-inch square nut on one end, and a 6-inch square spacer on the other. It is not known what the latter fastener was for, but it is not consistent with common late-nineteenth-century ship construction. This, coupled with the relative few number of fasteners in a timber of this size, and the unusual ironwood pieces, make this feature's association with *Dora Bluhm* unlikely.

Another feature which is probably not associated with a vessel of any kind is CP-021. This is an extremely large timber, 16 feet 9 inches long and about 1 foot wide, though rounded in cross-section. In its entire length it only has four 1-inch diameter drifts and three 1/2-inch spikes. Because of its size, shape, and the small number of fasteners in it, feature CP-021 is probably not related to *Dora Bluhm*.

On the basis of timber size, and the number and size of fasteners, nine of the remaining twenty timbers studied are possibly structural members of a late-nineteenth-century sailing vessel, while the other eleven are not structural in

nature.

Of nine structural elements, features CP-001, 010, and 012 are all similar Douglas fir timbers with large, iron fasteners. The first (CP-001), heavily abraded and worn, is 14 feet 10 inches long, with maximum dimensions of about 15 inches by 13 inches (Figures 30 and 31). Both ends of the timber are broken; original length is indeterminate. There are ten vertical, iron drift pins along its length, and the empty hole of an eleventh. Six drift pins are 1 1/4 inches in diameter (though slightly expanded by corrosion), four measure 1 inch in diameter, and the empty hole is 1 1/8 inch in diameter. These fasteners are grouped roughly in pairs (including the empty hole): the paired pins are approximately 1 foot apart, and the pairs are about 2 feet apart. One pair has an additional 1-inch diameter drift between them. These vertical fasteners are broken close to the timber on both sides. In addition to the vertical fasteners, there are several transverse drift pins and spikes. These include four 1/2-inch square spikes and two 3/4-inch diameter drift pins with 2-inch diameter (possible) clinch rings on one end. The two drifts are paired and 9 inches apart. The drifts protrude from the timber 7 inches on the ends with the clinch rings. There is no other evidence of fasteners on the timber's side faces.

Feature CP-010 is 14 feet 9 inches long (broken at both ends), and has maximum dimensions of 15 inches by 11 inches,

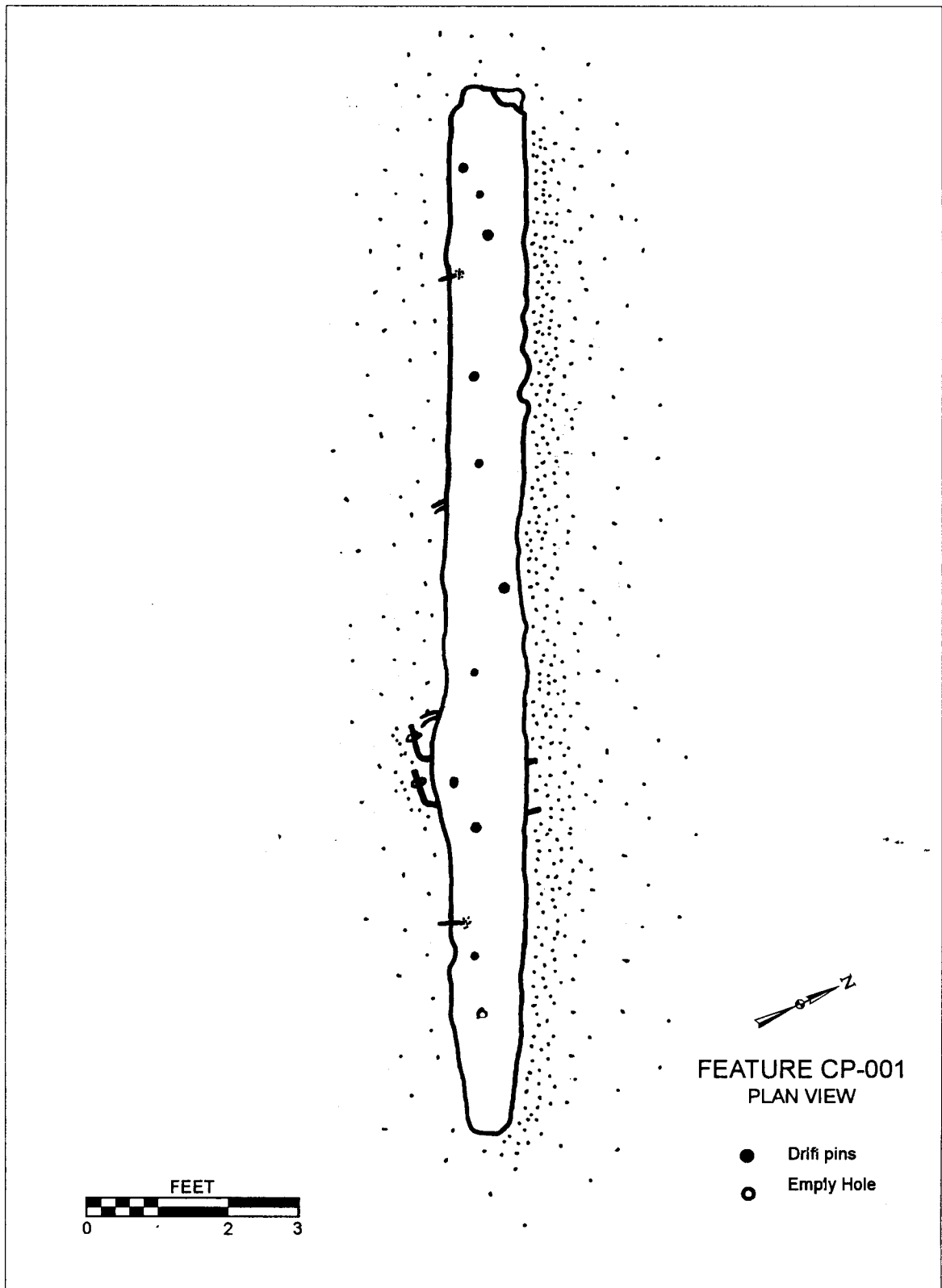


Figure 30

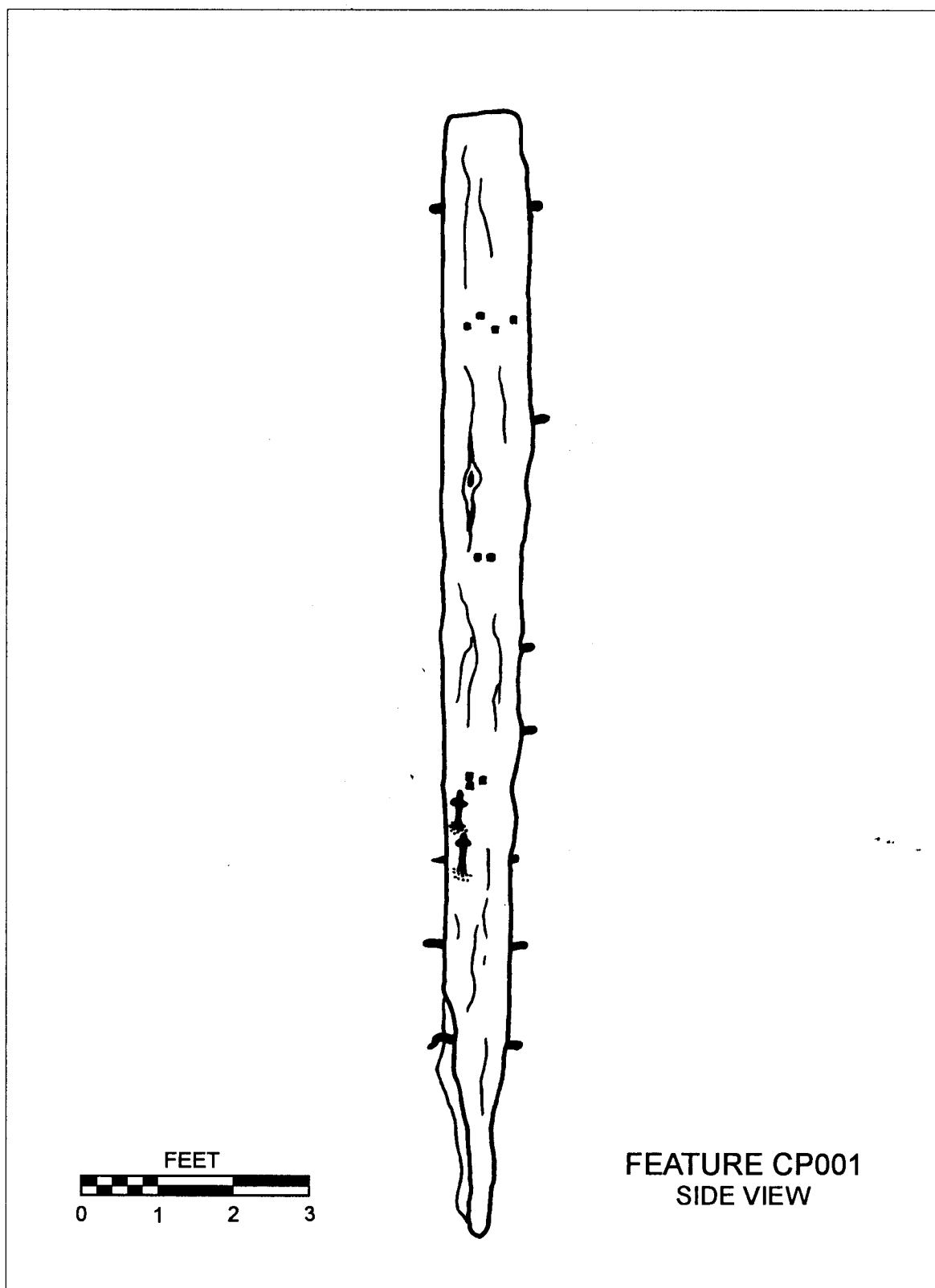


Figure 31

though somewhat deteriorated (Figure 32). It contains ten vertical iron drift pins along its length, and holes for two more. These fasteners (and holes) include seven 1 1/4-inch diameter pins, four 1-inch diameter pins, and a single 3/4-inch diameter pin. The piece also includes transverse fasteners: a pair of 1 1/4-inch diameter drift pins; a pair of 3/4-inch diameter drifts; a single 5/8-inch diameter drift; another, single 3/4-inch diameter drift; and a pair of 5/8-inch diameter drifts. There is no discernible pattern to fastener spacing.

Feature CP-012 is a similar timber, measuring 14 feet 3 inches in length (broken at both ends), with maximum dimensions of 14 inches by 13 inches, again with some deterioration (Figure 33). The most conspicuous features of this piece, besides the fasteners, are two large holes penetrating all the way through the timber, apparently caused by some kind of differential deterioration. There are no large fasteners in or around these holes, so it is unknown if the deterioration was centered around iron drift pins, as seen in feature PB-001. Like the two previous features, CP-012 has several vertical, as well as transverse, iron fasteners. The vertical fasteners include five 1 1/4-inch diameter drift pins, three 3/4-inch diameter drifts, and a single 7/8-inch diameter bolt with a 1-inch square nut on the end. The transverse fasteners consist of two 5/8-inch diameter round drifts, two 1 1/4-inch diameter

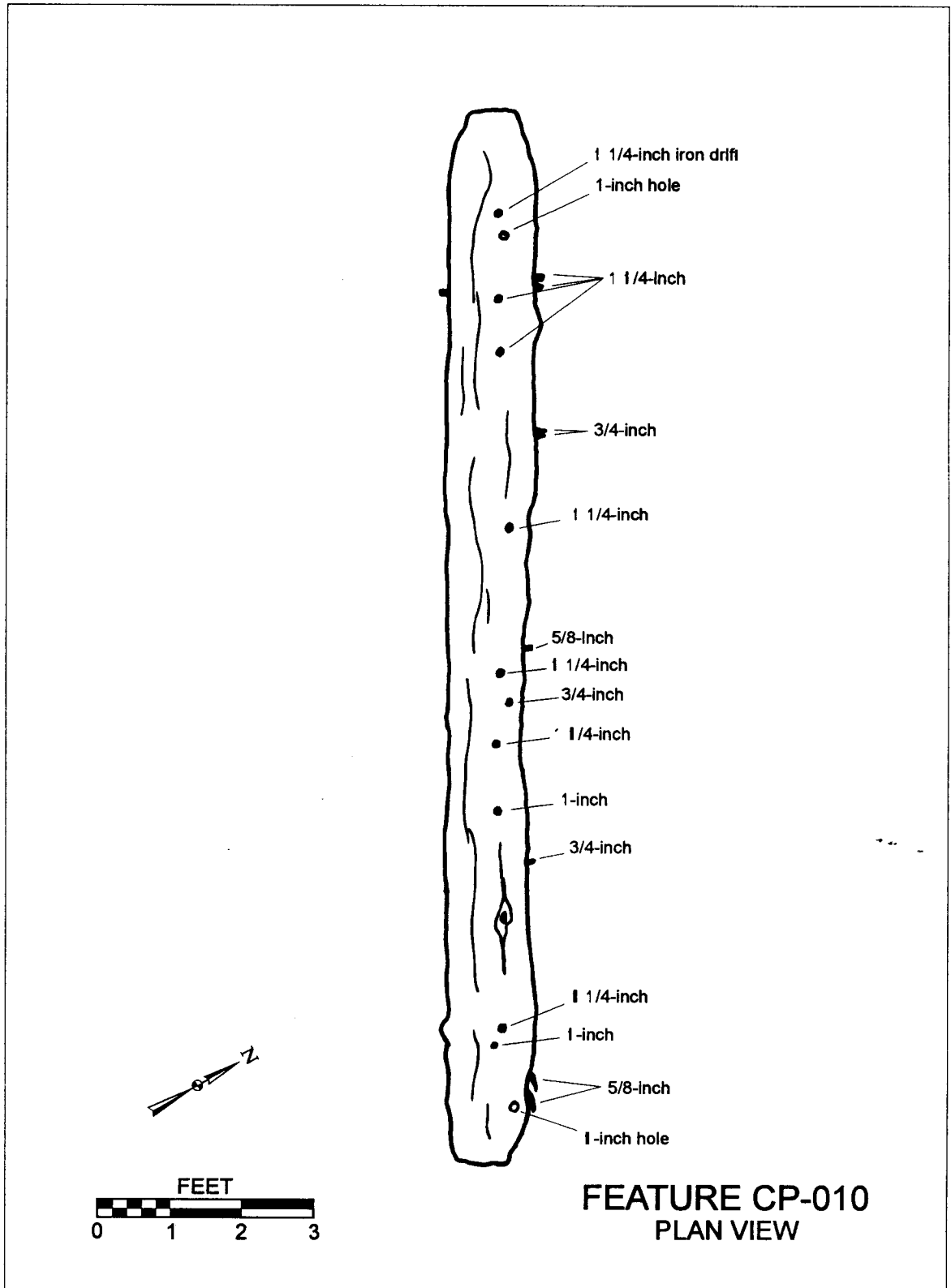


Figure 32

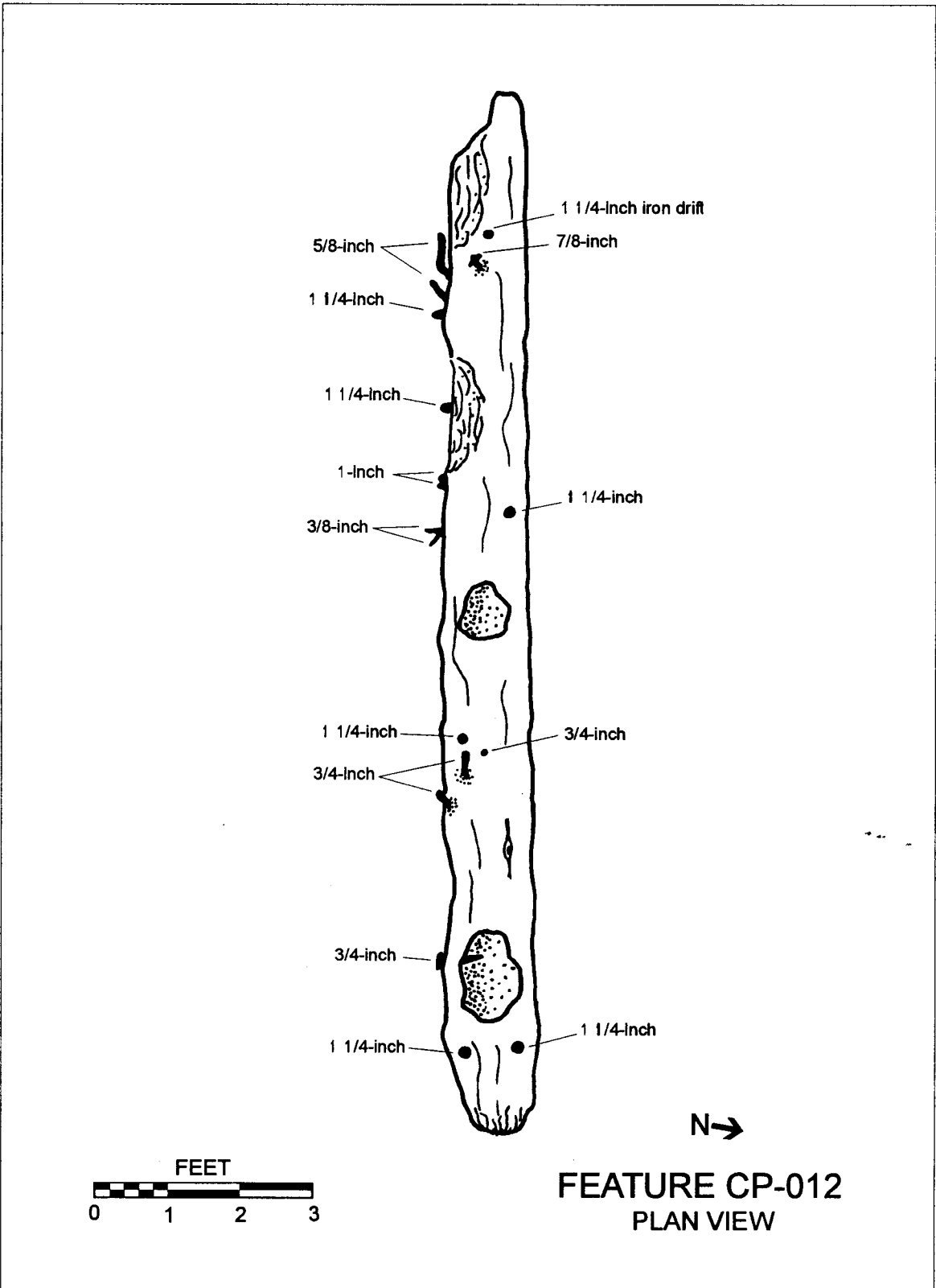


Figure 33

drifts, two 1-inch diameter drifts, two 3/8-inch diameter round spikes, and a single 3/4-inch diameter round drift.

The size, shape, and fasteners of these three features indicate these timbers are structural members from a large, wooden vessel. The configuration of each makes it probable they represent elements of a vessel's centerline structure. Like PB-001, lack of a longitudinal rabbet and presence of transverse fasteners precludes these pieces from being a vessel's keel, but rather indicate they are portions of either the main, sister, assistant, or rider keelsons.

The original contract for *Dora Bluhm* provides a basis for the interpretation of these timbers. The contract specifies the main keelson was to be sided 16 inches and moulded 16 inches, while the sister keelson was to be sided 12 inches and moulded 18 inches.²⁷ If features CP-001, CP-010, and CP-012 are keelson elements, then, based on sided and moulded dimensions, CP-010 could be either part of the main or sister keelson, while CP-001 and -012 could only be part of the main keelson (taking into account some deterioration). Assistant and rider keelsons are not mentioned in the contract.

In addition to specifying timber dimensions, the contract required the keelson to be fastened with 1 1/8-inch iron fasteners. In all likelihood, all of the 1 1/4-inch measurements for the fasteners in CP-001, 010, and 012 are greater than the original measurement because of expansion

caused by iron deterioration. This observation is supported by the single 1 1/8-inch diameter hole found on CP-001, which is assumed to be unaltered. Therefore, it is likely that the 1 1/4-inch diameter fasteners recorded on all three timbers were originally 1 1/8-inch iron fasteners. This does not, however, account for the additional smaller fasteners found in these three timbers. It is conceivable that smaller iron was used in the transverse fasteners to edge-bolt the main and sister keelsons together. There is no mention in the contract of smaller iron in the vertical through-fasteners that fastened the keelson through the floor into the keel, or the sister keelson into the floor or futtock. These smaller fasteners remain unexplained. It is, nonetheless, probable that features CP-001, 010, and 012 represent portions of the keelson structure of *Dora Bluhm*.

Two features that may represent small portions of structural members are features CP-008 and CP-023 (Figure 34). Both features are 3 feet long and nearly square in cross-section. Feature CP-008 is 3 1/2 inches wide and 3 1/4 inches thick; all its faces are extremely worn. It contains two round spikes 2 feet 2 1/2 inches apart. One is 3/4 inch in diameter and the other is 7/8 inch in diameter, though both are exfoliating badly. Feature CP-023 is slightly over 4 inches wide and 3 7/8 inches thick; all its faces are also very worn. It contains three iron spikes, all 1/2 inch in diameter. The first and second spikes are

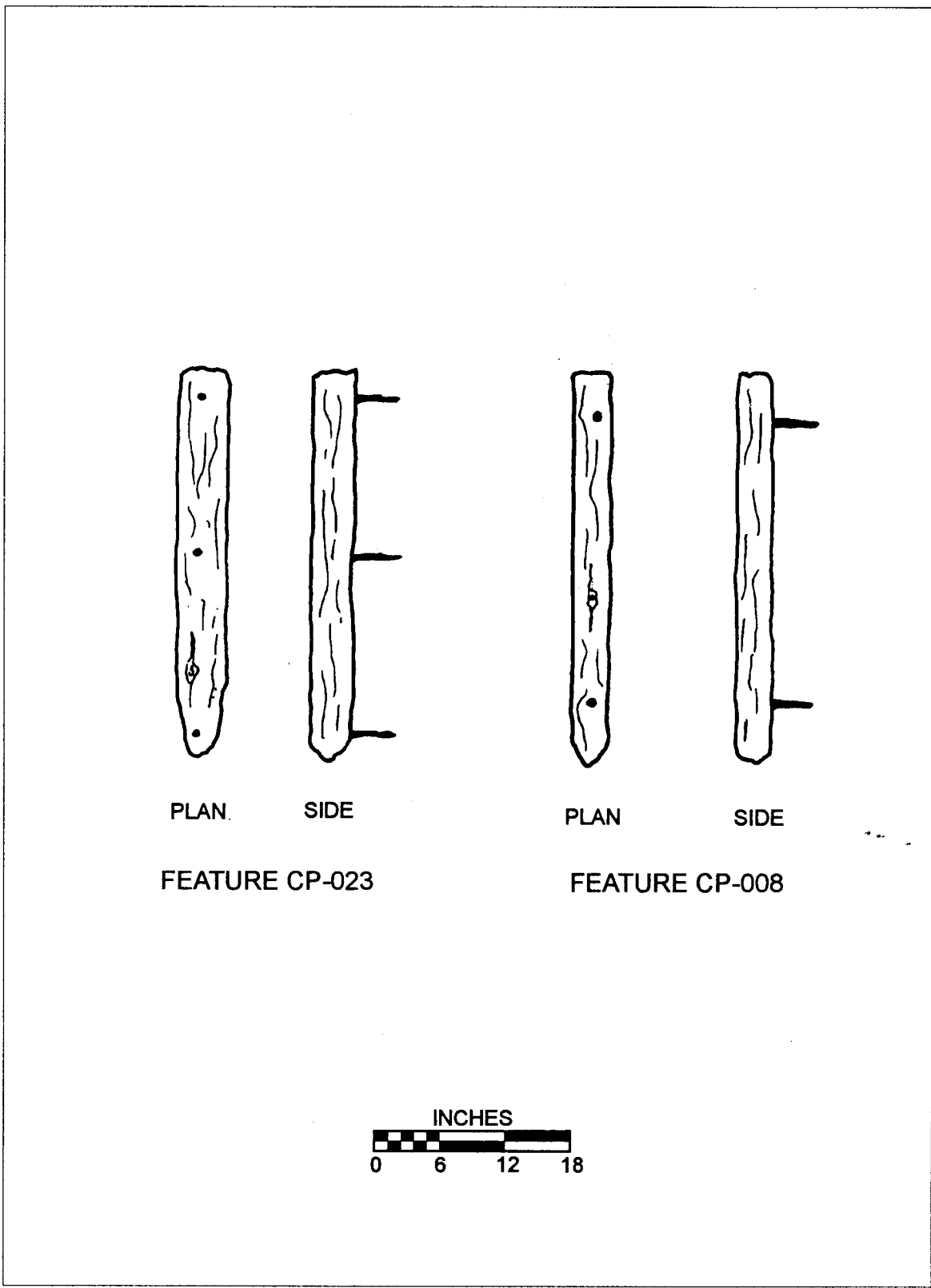


Figure 34

spaced 1 foot 2 inches apart, while the second and third are 1 foot 5 inches apart.

Dora Bluhm's contract calls for 4-inch by 4-inch main-deck planking.²⁸ With deterioration taken into account, either feature could be fragments of main-deck planking. Fastener spacing cannot be used as an indicator for identification of these features, because it is possible that spikes were fastened into carlins or lodging knees, and not only into deck beams. The fasteners may have been countersunk and plugged, which is typical practice for main-deck planks; the plugs have since disappeared and the face deteriorated enough to hide traces of countersinking. It is probable that features CP-008 and CP-023 represent portions of the main-deck planking of *Dora Bluhm*.

Feature CP-017 is also a structural member from a large, wooden sailing vessel (Figure 35). The extremely deteriorated wood fragment is 3 feet 4 inches long, 7 inches wide and 10 inches thick. It contains, however, five 1 1/2-inch diameter iron drift pins (the longest 3 feet long), and a 2-inch diameter iron eye-bolt with a 6 1/2-inch outside diameter ring attached. The eye-bolt and ring represents a tie-down point, which could have been placed in many locations on the vessel. The five fasteners' original measurements were considerably smaller, accounting for iron corrosion expansion. The largest fasteners required in *Dora Bluhm* contract were 1 1/8-inch drifts for the keel, keelson,

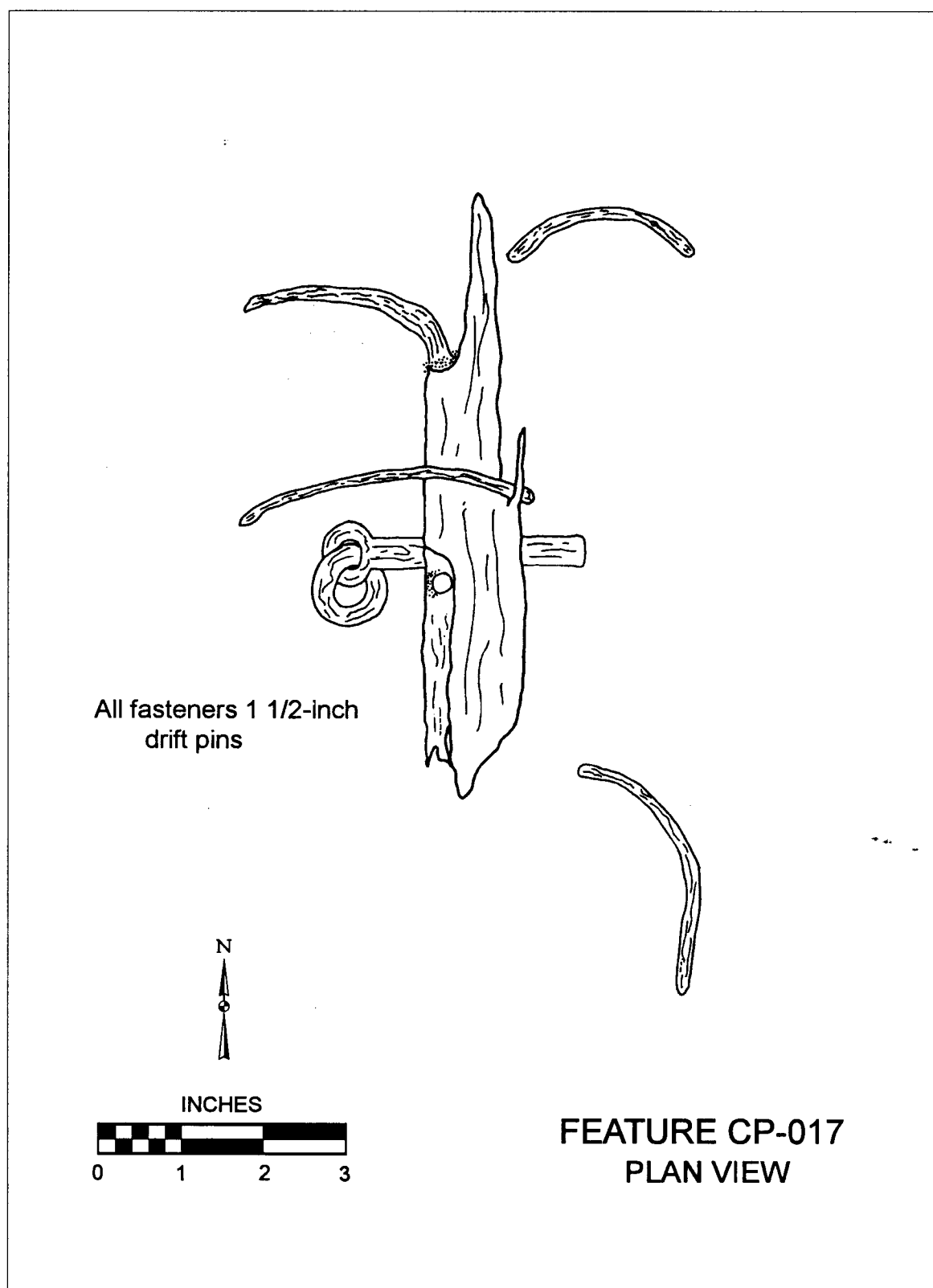


Figure 35

stem, and stern post. CP-017 likely represents a small portion of any of these components.

The next feature probably a structural member of *Dora Bluhm* is CP-022 (Figure 36). This feature is composed of two timbers, each with an original width of 12 inches and surviving lengths of 12 feet 10 inches. The timbers are edge-bolted together with four 1 1/4-inch diameter drift bolts. The four fasteners originally edge-bolted at least two more timbers to the two surviving pieces, one on each side. The timbers have a present thickness of 5 inches, but the undersides are extremely deteriorated, so they were originally thicker. The fasteners are slightly expanded, so they were probably originally 1 or 1 1/8 inch in diameter.

At first glance, it appears this piece may be a portion of ceiling or outer-hull planking, both of which were often edge-bolted.²⁹ But this feature does not have evidence of fasteners coming through the face, while both ceiling and outer hull planking would have numerous large fasteners attaching them to every frame. Another possibility, since *Dora Bluhm* was built with a centerboard, is that feature CP-022 is a fragment of the centercase. The vessel's contract specifies the centercase was to be constructed of 8-inch thick timber and fastened with 1-inch iron.³⁰ With the severe deterioration on the underside of this feature, these timbers may have originally been 8 inches thick. The fasteners also may have originally been 1 inch in diameter.

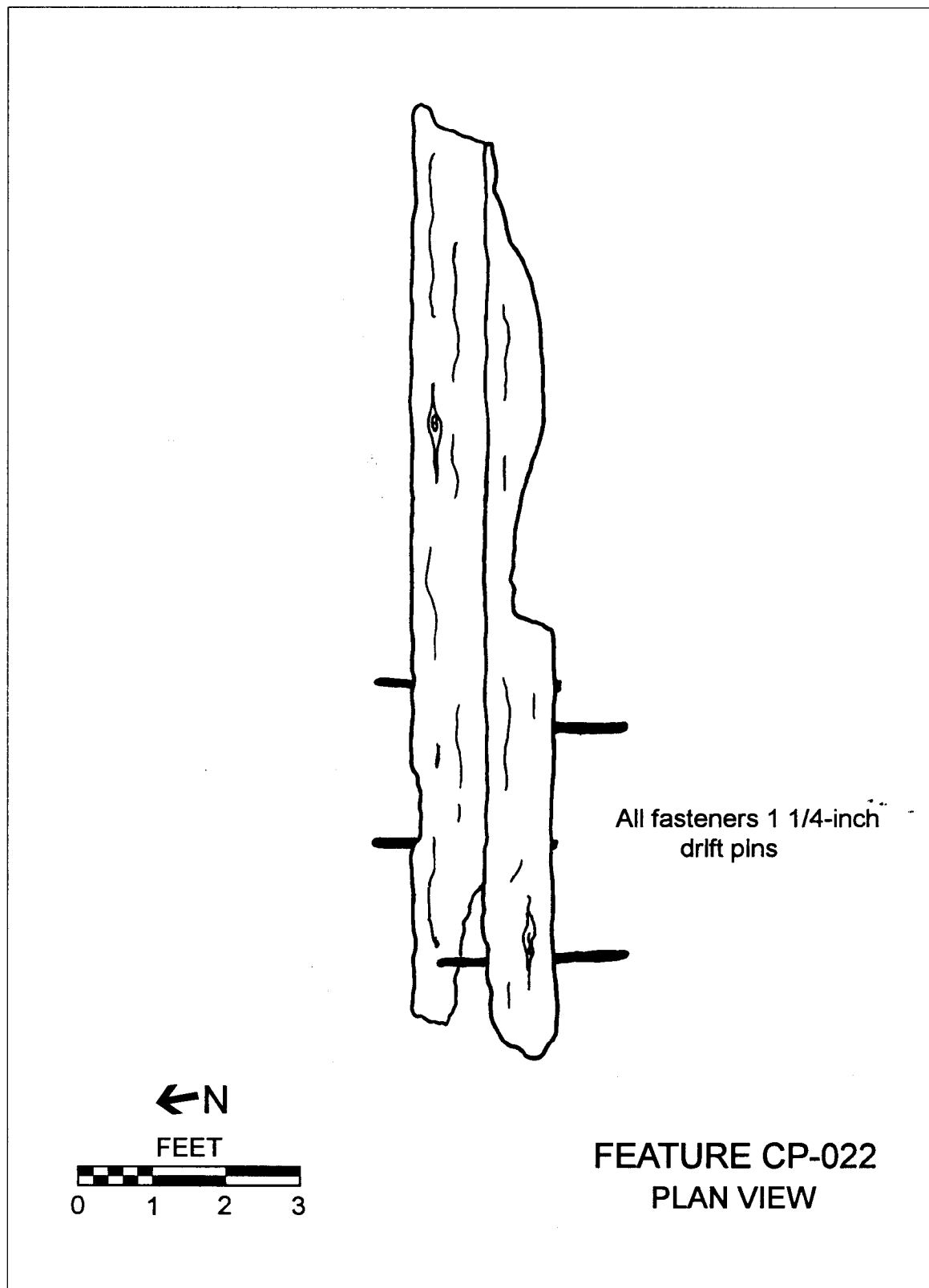


Figure 36

Furthermore, the centercase would have been entirely edge-fastened, which CP-022 clearly displays.³¹ This feature can be distinguished from the centerboard itself, which would have been more heavily fastened. Therefore, feature CP-022 is most likely a portion of the centercase, or centerboard trunk, of *Dora Bluhm*.

Feature CP-019 is an oddly shaped piece that exhibits characteristics that are clearly from a large, wooden vessel (Figure 37). The feature itself is sizable and contains forty-seven iron fasteners, all of which are 3/4-inch diameter round drifts. The piece is composed of two components: a large, lower timber with three mortises along one edge, and a top portion made up of three different sections. These segments include a long piece joined to a fragment by a triangular chock. These three sections are fastened to the lower timber by thirty-three fasteners. The bottom part of the feature is 9 feet long, 18 inches wide, and 12 inches thick. The top timbers are 10 1/2 inches wide and 3 inches thick. Like most of the other features, both ends are broken, so original length and configuration are unknown.

Dora Bluhm's contract does not go into sufficient detail to identify this feature based on the size of fasteners alone. This is clearly a unique piece, however, and could not have been incorporated into very many areas on a sailing vessel. In addition, its size and number of

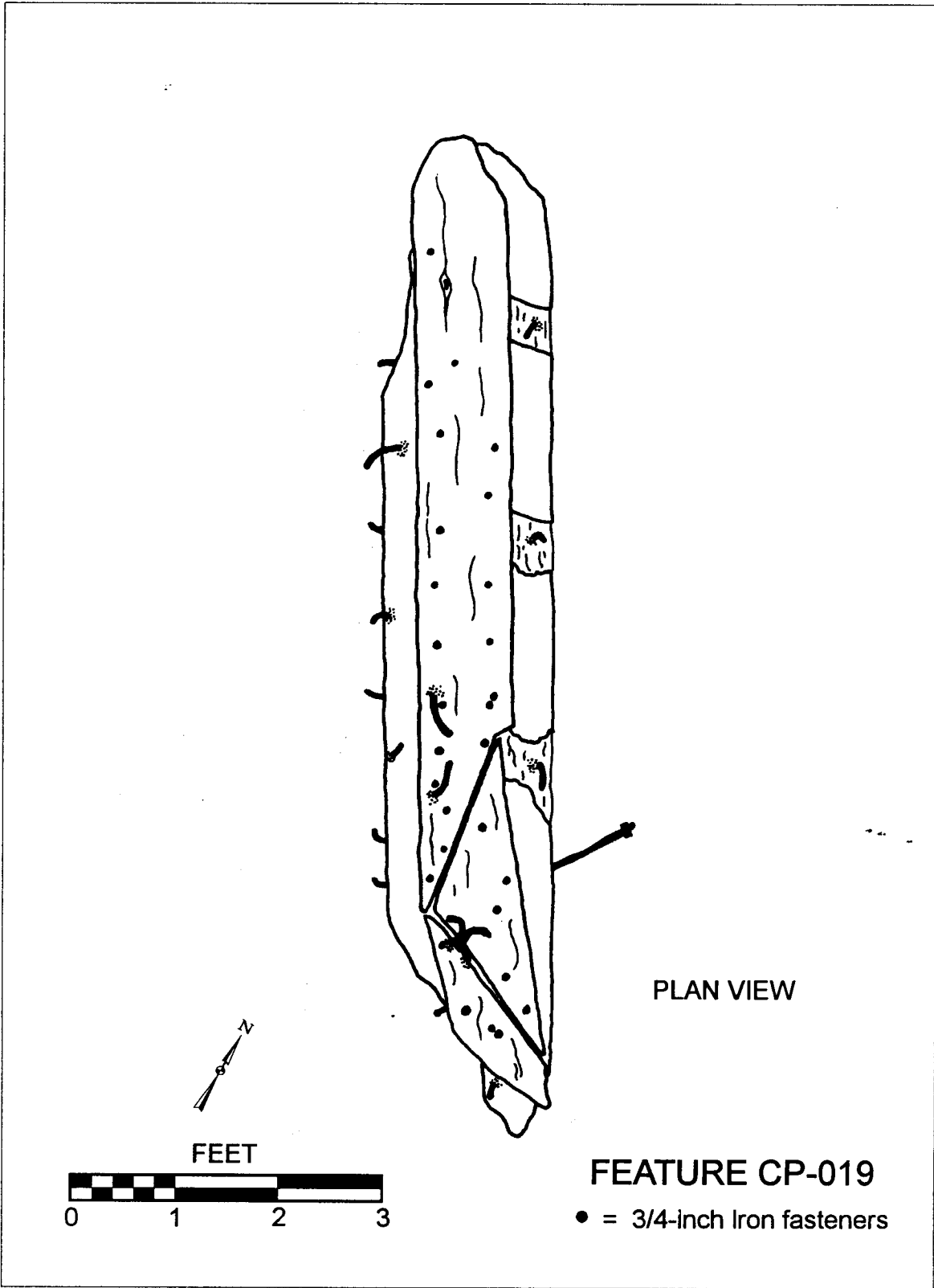


Figure 37

fasteners denote a major structural function. The mortises suggest beams were fitted into the side of the timber, making that piece a deck shelf. Obviously the mortises are too small to have received main-deck beams. In addition, if this piece is a main-deck shelf, then it would have been fastened to the frames using much larger fasteners than the 3/4-inch diameter fasteners present. The chock and the angle of the smaller fragment indicate this piece was at one time part of a curved portion of a vessel.

These attributes suggest this piece is part of the deck clamp or shelf and planksheer for the poop deck of a large, wooden vessel. In the stern, surrounding the poop deck, is an area known as the solid work. In the forward part of the poop, just aft the break of the poop, frames are carried all the way up to the poop deck. This configuration ends further aft, however, and instead, the upper ends of the stern frames end at the knuckle line. Above these frame ends is the solid work, which consists of thick horizontal beams carried around the stern of the vessel. The outer strakes are fastened directly to the solid work, as there are no frames in this area. This accounts for the smaller fasteners used on the outside edge of feature CP-019. The beam ends for the poop deck would have been laid into the mortises on the inside edge of CP-019, and the plank sheer, or cover board, would have laid over the beam ends. This piece likely represents a portion of the vessel's port side,

because of the curve exhibited by the end of CP-019. Because these pieces are not discussed in *Dora Bluhm's* contract, it is impossible to verify this interpretation using scantling or fastener sizes.

The last structural member discussed is feature CP-020 (Figure 38). It is a relatively flat piece, with a uniform thickness of 8 1/2 inches. The main timber is 7 feet 3 inches long (though broken at the ends) and 1 foot 9 inches wide, while a smaller 4-foot by 1-foot 4-inch fragment is fastened to it at an angle. The feature contains nineteen 3/8-inch square spikes and seventeen 7/8-inch diameter drifts. Timber and fastener configuration suggest this piece represents a portion of the "rim" of a large, wooden vessel, while the smaller fragment attached to it is a component known as the anchor stock.³² The rim circled the stern of the vessel and formed the knuckle line, or main-deck line. The rim was generally composed of three sections, joined by two chocks called anchor stocks. The upper ends of the stern frames ended at the bottom of the rim, and the solid work was directly above it. It was a major stern structural element.

As mentioned above, the eleven remaining features recorded are not structural members from *Dora Bluhm*. The timber size coupled with number and size of fasteners makes association unlikely. It is possible, however, that they are non-structural fragments from a vessel of the size and

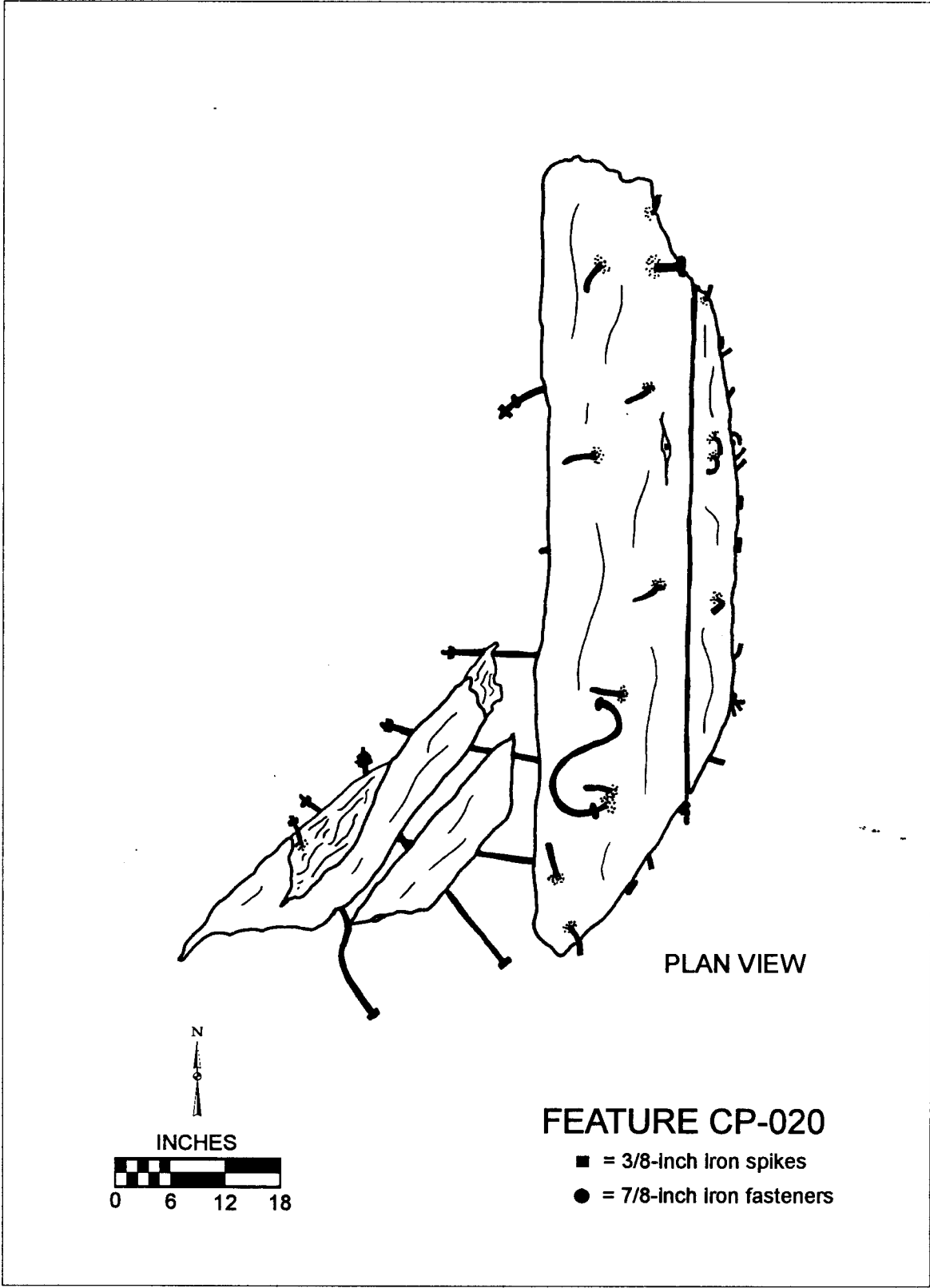


Figure 38

age of *Dora Bluhm*.

The final items at the Cluster Point Site discussed are fifteen loose fasteners. No fastener was directly associated with any timber, so little can be speculated about them. Their sizes, however, suggest association with a large, wooden vessel of *Dora Bluhm's* size. The size of each of these fasteners is found in Table 1.

All in all, as with the Northwest Cove Site, the Cluster Point Site contains several timbers that are likely associated with the Hall-built schooner. Even so, however, the majority of this vessel is not found on the shore at Cluster Point. The historic account of the wreck event discussed in Chapter V implies *Dora Bluhm* ran aground, was quickly battered to pieces, and sank. With no shallow intertidal zone offshore Cluster Point, this is likely. More likely, perhaps, is that the vessel was broken up and scattered, with only these few timbers remaining.

Comet Site

Very little of *Comet* was observed during this project. The 1984 photographs and the terrestrial magnetometer survey conducted during this study suggest, however, that the remains may well be extensive. This magnetic survey, which covered a forty-meter by twenty-meter area around the exposed anchor, showed a very active magnetic zone (Figure 39). The region just east of the anchor is relatively

FASTENER	DIAMETER (INCHES)	LENGTH (INCHES)
F-01	3/4	5
F-02	-	8
F-03	1	23
F-04	1 1/2	25
F-05	1 1/2	21
F-06	1 1/4	21
F-07	1 1/2	24
F-08	1 1/2	25
F-09	1 1/2	22
F-10	1 1/2	24
F-11	1 1/2	23
F-12	1	17
F-13	1	12
F-14	1	11 1/2
F-15	1 1/8	6

Table 1

quiet. The anchor itself shows up as a very large anomaly, greater than two thousand gammas. Adjacent to it to the north is another smaller, distinct anomaly of several hundred gammas. The area to the northwest shows a series of large anomalies that extend throughout the rest of the survey area. Although it is impossible now to determine exactly what caused the anomalies, the contour map represents a highly concentrated area of magnetic intensity in the vicinity of visible shipwreck remains attributable to *Comet*. Although exposing this area is the only way to confirm association, the magnetometer survey indicates that extensive buried structure remains.

Unfortunately, these remains were not accessible during this study, however, the most prominent site feature, the anchor, was totally exposed and recorded (Figures 40 and 41). Examination of the anchor reveals probable association with *Comet*.

The anchor on the *Comet* Site is iron, with a collapsible iron stock. The anchor is fitted with a ring, but no cable is present. The overall length is 7 feet 11 inches; stock length is 7 feet 9 1/2 inches. Anchor arms are 3 feet long, with 5 feet 6 inches between palm tips. The palms measure 1 foot 3 3/4 inches wide by 1 foot 6 inches long, and 1 1/4 inches thick.

Contemporary late-nineteenth-century and early-twentieth-century vessels were required to carry a variety

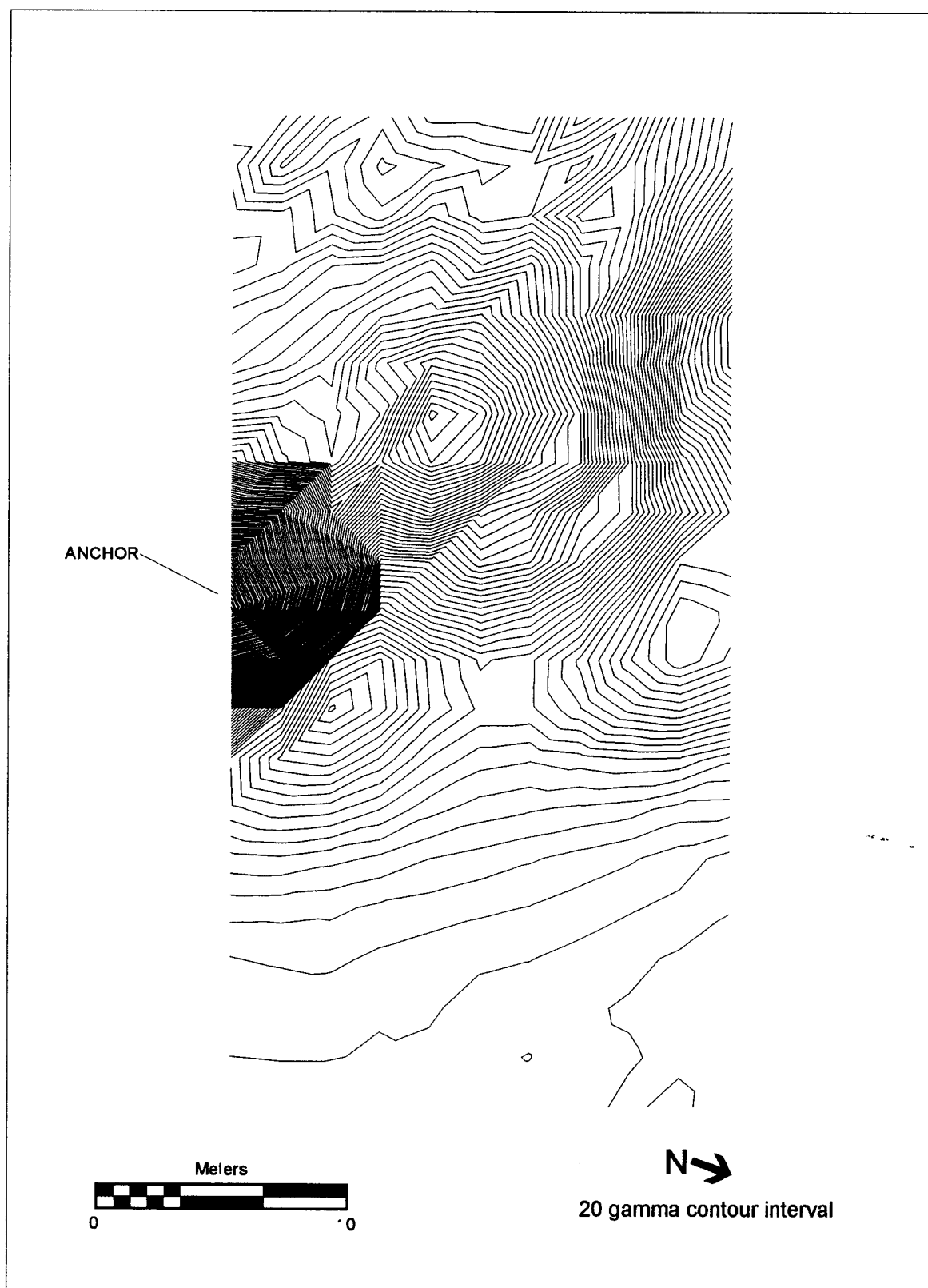


Figure 39. Comet site magnetometer data

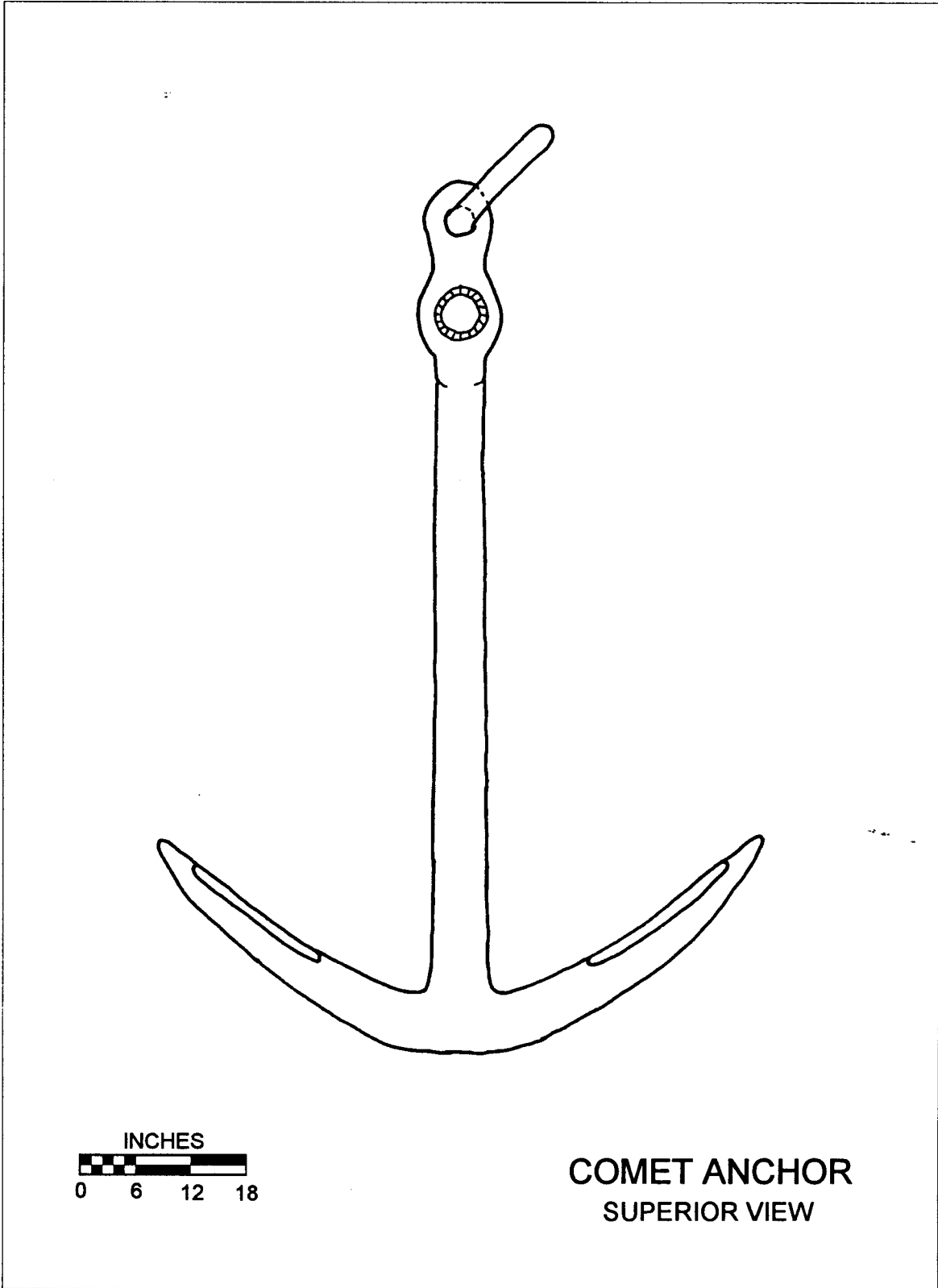


Figure 40

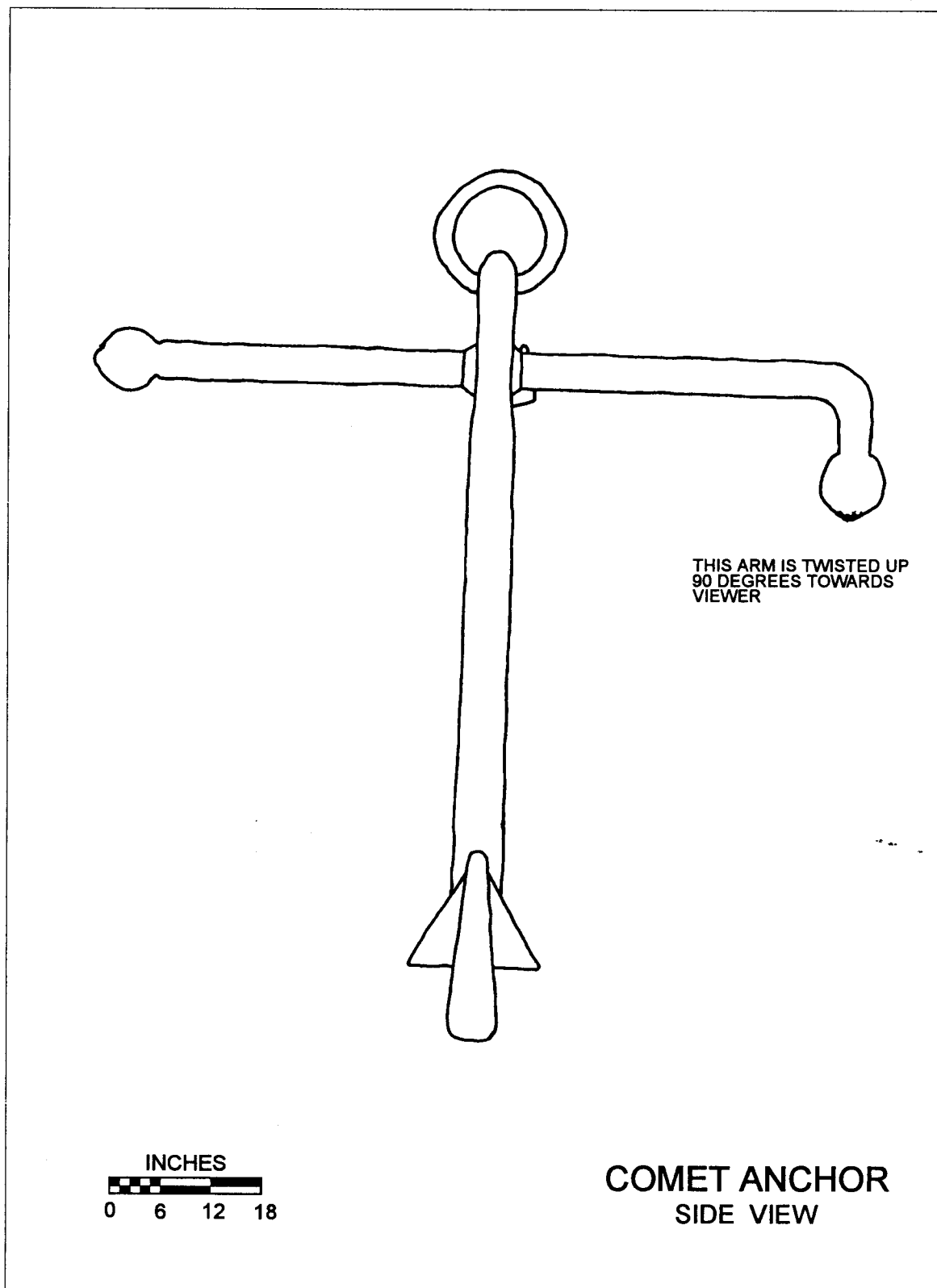


Figure 41

of anchors. Classification societies required most ocean-going vessels at this time to carry at least three, and usually four, anchors, including two bowers, a stream, and a kedge.³³ The bower anchors were the largest and most important anchors on board a vessel. They were "lowered from the bow, hence their name . . ." and were kept rigged and ready for deployment at all times.³⁴ The stream and kedge anchors were smaller (stream about one-third the weight of the bower, and the kedge about one-half the weight of the stream) and often kept broken-down and stored until needed. They were used for such things as moving the vessel around (kedging), temporary anchoring, and used as a stern anchor to keep the vessel from swinging around in a tide.³⁵

The rules of classification stipulated the size (weight) that each type of anchor should be based on a vessel's registered tonnage.³⁶ It is informative to determine an anchor's weight. The *Cyclopaedia of Useful Arts* (1854) provides a formula for estimating anchor weight (in hundredweights (cwt) = 110 pounds): $CWT = \text{Overall length}^3 \times .0114$.³⁷ Using this formula, *Comet's* anchor weighs approximately 5.6 cwt or 616 pounds. A table of minimum weights of anchors for sailing vessels found in Desmond (1919) states a vessel of 400 tons (*Comet* registered 429 gross and 368 net tons) was required to carry two 1850-pound bower anchors, a 600-pound stream anchor, and a 300-pound kedge anchor. The anchor found on the *Comet* Site most

likely represents its stream anchor. Lack of rigging and cable attached to the anchor gives support to the identification of a stream anchor, in that, although the stock was not collapsed, it was probably not rigged for deployment. Consequently, the anchor arrived at its location in *Comet's* hull, whose presence is indicated by the 1984 photographs and magnetometer data.

Comet's original contract states the vessel was to be equipped with one 1800-pound anchor, one 1550-pound anchor, and one 400-pound kedge. No mention is made of a stream anchor. It is probable, however, that the vessel changed or replaced anchors during its twenty-four-year career.

If this anchor represents *Comet's* stream anchor, then a number of points are raised. Murphy (1993) states that, because vessels carried at least four anchors, "multiple anchors are expected on wreck sites."³⁸ In addition, "if a ship were in distress, the bower and other anchors might be deployed and perhaps lost; smaller anchors would, consequently, be more likely to be found near the structure of a shipwreck."³⁹

In *Comet's* case, however, bower anchors were probably not deployed. After the schooner struck Wilson Rock, it was intentionally grounded in Simonton Cove. Therefore, unless the anchors were deployed when the vessel initially struck, it is not likely the bower anchors were dropped to keep the schooner from going ashore on San Miguel Island.

Furthermore, *Comet's* wreck report notes that the only action taken to avoid casualty was that the vessel "lowered the sails to ease the strain."⁴⁰ No mention was made of anchors being deployed. The most likely scenario, therefore, is that *Comet's* bowers and kedge anchors were removed during the extensive salvage of the vessel in the months following the wreck event.

This discussion raises several questions about this anchor. If the other anchors were salvaged from the wreck, why was this one left behind? Possibly it was below decks and not accessible to the salvagers. But, if that was the case, why was the stock not collapsed? It would be expected that if stored below decks, the anchor's collapsible stock would be broken down. Perhaps this anchor was deployed to hold the hull on shore. There is no doubt that this site warrants more detailed attention. Unfortunately, the only practical way to do this is to wait until the weather exposes the site naturally.

Natural Site Formation Processes

An important aspect of this study was to determine the natural site formation processes at work on these sites. Like any other archaeological site, wreck scatters at Northwest Cove and Cluster Point are subject to predictable natural processes. An understanding of these mechanisms is important for site interpretation. In the case of the

Northwest Cove and Cluster Point Sites, the collection of material studied could only have arrived by one of two ways: the objects either floated there or they were deposited by a wrecked vessel. There is no other alternative.

There is no doubt as to how the collection of iron material came to be in Northwest Cove. These elements are clearly shipboard objects associated with ground tackle and bow machinery, and it is physically impossible to have floated to this location unless attached to a whole bow structure. Because bow and stern sections are the weakest portions of a wooden vessel, it is doubtful a bow section would detach and stay together and float to another location. The most reasonable conclusion is that the iron material represents a primary deposit from a wrecked or stranded vessel.

To test whether the wooden material at each site could have floated to its present location, an analysis of the mass of the keelson fragment (PB-001) at the Northwest Cove Site (which is the largest timber containing the most iron fasteners) versus the mass of its iron fasteners was conducted. Using table found in Desmond,⁴¹ it was determined that the Douglas fir timber weighs approximately 2200 pounds and has a specific gravity of 0.56, while the iron fasteners altogether weigh about 170 pounds. This means that this timber was positively buoyant, and would float if not waterlogged. Consequently, it is remotely

possible that any of the wooden elements recorded at these two sites could have been transported from anywhere along the California coast by wind and current. For the identified structural elements recorded at these sites, this possibility is extremely unlikely, given the historical associations, and the fact that the timbers and fasteners have been consistent with the *Rules for the Construction of Wooden Vessels* for a vessel of *J. M. Colman's* tonnage and the contract specifications for *Dora Bluhm*.

This study has shown that even widely scattered beach shipwreck sites can be systematically and productively interpreted, although such remains have been dismissed by many in past work. Although the Northwest Cove and Cluster Point Sites contained a relatively small amount of vessel-related material, it could be determined for each element whether it was a structural hull member or not, and, after comparing to original construction contracts and the *Rules for the Construction of Wooden Vessels*, whether association with *J. M. Colman* and *Dora Bluhm* was likely. Examining site formation processes demonstrated that the iron material at the Northwest Cove Site was probably associated with *J. M. Colman*, but was inconclusive in determining association for all wooden material at each site. Although frequently discounted in the past, systematic investigation of isolated shipwreck elements using multiple data sets, historical references, insurance requirements, and natural processes

can produce useful and important archaeological information. In addition, monitoring the sites over time will increase our knowledge of beach shipwreck dynamics as features shift position and additional material is uncovered, and continue to augment what is known of these three vessels and the Hall Brothers Shipyard practices.

NOTES

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³*Santa Barbara Morning Press*, 3 November 1906, cited in Don Morris, *Shipwrecks and Mishaps at Channel Islands National Park* (Unpublished Manuscript, 1990), np.

⁴Charles Desmond, *Wooden Shipbuilding* (New York: Rudder Publishing Co., 1919; reprint, New York: Vestal Press, 1984), 157,166 (page references are to reprint edition).

⁵Thomas R. Cox, *Mills and Markets: A History of the Pacific Coast Lumber Industry to 1900* (Seattle: University of Washington Press, 1974; , 231.

⁶Rene de Kerchove *International Maritime Dictionary* (New York: Van Nostrand Reinhold Company, 1961), 614.

⁷Kathryn Puseman, *Identification of Wood Samples from Channel Islands National Park, California, and from Dry Tortugas National Park and Biscayne National Park, Florida* (Denver, Colorado: unpublished manuscript, 1994), 6-7.

⁸Contract number 49, Schooner Comet, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

⁹*Record of American and Foreign Shipping* (New York: American Shipmaster's Association, 1879), 50.

¹⁰Desmond, *Wooden Shipbuilding*, 24.

¹¹Casper Thomas Hopkins. *Shipbuilding on the Pacific Coast* (No. 2) (San Francisco, CA: Board of Marine Underwriters, California Printing House, 1874.), 9-10.

¹²Desmond, *Wooden Shipbuilding*, 105.

¹³*Record of American and Foreign Shipping*, 23.

¹⁴Desmond, *Wooden Shipbuilding*, 104.

¹⁵W.H. Curtis, *The Elements of Wood Ship Construction* (London: Hill Publishing Co., 1919), 131, 152, 199, 201.

¹⁶Ibid., 133.

¹⁷Contract number 49, Schooner Comet.

¹⁸Ibid.

¹⁹Contract no. 40, Schooner *Dora Bluhm*, on file at the J. Porter Shaw Library, San Francisco Maritime National Historical Park.

²⁰Desmond, *Wooden Shipbuilding*, 157.

²¹Ibid.

²²Don Morris, pers. comm., 1993.

²³Contract no. 40, Schooner *Dora Bluhm*.

²⁴Ibid.

²⁵Puseman, *Identification of Wood Samples*, 6-7.

²⁶Ibid.

²⁷Contract number 40, Schooner *Dora Bluhm*.

²⁸Ibid.

²⁹Charles Desmond, *Wooden Shipbuilding*, 57-59.

³⁰Contract number 40, Schooner *Dora Bluhm*.

³¹Henry N. Barkhausen, *Focusing on the Centerboard* (Manitowoc, MI: Manitowoc Maritime Museum, 1990), 11-12.

³²Curtis, *Elements of Wood Ship Construction*, 66.

³³Desmond, *Wooden Shipbuilding*, 156.

³⁴H. Paasch, *Illustrated Marine Encyclopedia* (London: Model and Allied Publications, 1890, reprint Watford, England: Argus Books, Ltd., 1977), 150.

³⁵Ibid., 151.

³⁶Ibid.

³⁷*Cyclopaedia of Useful Arts*, 1854 Anchors. Typescript on file at San Francisco Maritime National Historical Park, San Francisco. Cited in Murphy, *Dry Tortugas National Park Submerged Cultural Resources Assessment*, 288.

³⁸Larry Murphy, ed., *Dry Tortugas National Park Submerged Cultural Resources Assessment* (Santa Fe, NM: Submerged Cultural Resources Unit, Southwest Region, National Park Service, 1993), 288.

³⁹*Ibid.*

⁴⁰Wreck Report #221, *Schooner Comet*, 11 September 1911, Record Group 26, National Archives, Washington D.C.

⁴¹Desmond, *Wooden Shipbuilding*, 18, 213.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

The investigation of the possible wreck sites of *J. M. Colman*, *Dora Bluhm*, and *Comet* in Channel Islands National Park has demonstrated the feasibility and value of studying scattered, beach shipwreck sites. Beached shipwreck material can offer valuable evidence concerning coastal geomorphology and site formation processes relevant to archaeological investigations. In addition, the scattered remains can be used to verify the historical record through analysis of scantling dimensions, wood type, and fastener types and patterns. This information in turn clarifies the larger historical picture concerning life in the nineteenth century by verifying trade patterns, ship use, technological change, and construction techniques.

The initial probe of the *Comet* Site has revealed the high probability that there are extensive remains under the sands of Simonton Cove. This important potential resource can add valuable data to our knowledge of Pacific coast lumber schooners. The study of the scant remains at the Northwest Cove and Cluster Point Sites has demonstrated what can be learned from scattered, beach shipwreck remains. Although conclusions about feature associations with the Hall-built schooners must ultimately remain inconclusive,

the evidence collected has shown the likelihood that several of these features are from *J. M. Colman* and *Dora Bluhm*. This is especially true of the iron material in Northwest Cove's intertidal zone. The steam donkey-engine boiler, hawse pipes, crosshead mechanism from a pump-brake windlass, and scattered windlass or donkey engine parts, because they are unduplicated, associated, and are of comparable size, are likely from a single wrecked vessel. In addition, the fact that there are only two hawse pipes, and only one of each other iron object, is significant. This lack of repetition within the collection of iron material strongly indicates a single source. This collection is consistent with elements of ground tackle and machinery expected aboard a late-nineteenth-century Pacific coast lumber schooner. Because *J. M. Colman* is historically documented to have wrecked in this location makes the circumstantial evidence for this artifact collection's association with that vessel very strong.

Although the same degree of certainty cannot be assigned to the remaining features, this project has shown that rigorous, systematic testing and examination of even widely scattered, disarticulated timbers and objects can produce viable interpretations. By comparing scantling sizes and fastener size and number to original construction contracts and published classification rules, it is possible to distinguish between structural and non-structural

members, and offer timber identification. In this way it has been demonstrated that features PB-001, 002, 011, and 014; and CP-001, 008, 010, 012, 017, 019, 020, 022, and 023 are most likely structural members from a wooden, ocean-going vessel with construction consistent with late-nineteenth-century practices. This makes association with *J. M. Colman* and *Dora Bluhm* a high probability. Once association is established, the disarticulated elements can be examined for undocumented construction details, such as variation from standard practice or repairs.

One of the important outcomes of this project was that the information gathered can be applied to the study of natural site formation processes and the dynamics of scattered, beach wreck remains. Probably the most compelling observation of the Northwest Cove and Cluster Point Sites is that the majority of the vessel timbers are not present. The obvious question is, what became of them? The answer to this question would be valuable to the study of how wooden shipwrecks break up and are distributed. Unfortunately, this question is not easily answered because there are many possibilities, and few controls or comparisons at this early stage beached shipwreck research.

In the case of *J. M. Colman* in Northwest Cove, the most likely scenario is that the grounded vessel was simply battered to pieces by the sea where it went ashore. This possibility is reinforced by the iron material in the

intertidal zone. None of these items floated to their present location, and wave action could not have brought them there, so they must have been deposited by a vessel which broke up in the vicinity. The remains of the hull were probably either washed ashore or floated out to sea as they broke up. Once out to sea, they may have been carried away by the variety of currents active in the area, or they may have sunk not far from where the vessel was originally stranded. In addition, the elements that washed ashore may have been removed one by one through storm action and high seas over the decades, and either floated away or sunk nearby. Another, less likely, possibility is that undocumented salvage activities took place, and that wood from the hull was carried away for sale on the mainland or incorporated into island construction projects. Whatever the process of *J. M. Colman's* break up, it must have been nearly complete by the time *Comet* wrecked in 1911. As discussed in Chapter V, the historical photos taken in Northwest Cove shortly after *Comet* grounded in Simonton Cove do not show any recognizable wreckage, so it is assumed none was visible.

Unlike the Northwest Cove Site, the Cluster Point Site offers no undeniable evidence that a vessel wrecked nearby. Everything recorded at the site could have floated to its present location. If it is assumed that the features examined at the site are from *Dora Bluhm*, then there are

several possibilities as to how they got there, and where the rest of the vessel is. If the vessel went ashore and was quickly broken up, as was reported in the historical accounts of the wreck, then the hull remains probably either washed ashore or floated out to sea. Like those at Northwest Cove, they might have either been carried away entirely or sunk offshore in the vicinity. Therefore, there exists the possibility that extensive remains exist offshore from Cluster Point. This possibility is much stronger at Cluster Point than at Northwest Cove because there is no shallow, intertidal zone at Cluster Point; the shoreline drops off to deep water quickly.

Another possible scenario is that the vessel grounded on Bee Rock, just offshore from Cluster Point, and quickly broke up and sank before reaching the island shore. If this is the case, the features recorded on the beach may represent elements dislodged from further remains offshore. In either one of these cases, if *Dora Bluhm* wrecked near Cluster Point, then at least the vessel machinery should be in the area. Unfortunately, it is most likely that, even if the schooner sank nearly intact, it has since been broken up and the remains have been widely distributed.

Even if no further remains of these vessels are located, the features recorded can tell us about the dynamics of isolated remains and scattered, beach shipwreck elements. Periodic monitoring of the recorded material

could demonstrate how these sites are affected by the forces of nature.

Recommendations for Future Research

Ideally, the conclusion of this project should be the first phase of a multi-phase study. Several recommendations of further research are offered regarding the wreck scatters in Northwest Cove and at Cluster Point and the *Comet* Site in Simonton Cove, so that the greatest amount of information possible can be gathered from these sites.

The first recommendation is that permanent, numbered tags be attached to all the material recorded during this project. Although temporary plastic tags were used during recording, these are not suitable as permanent markers. The tags should be made of a sturdy material with the feature number etched onto the surface. It would also be useful to include the name and phone number of Channel Islands National Park, and encourage the public to report any tagged material. A similar program was started in North Carolina to monitor scattered shipwreck remains on Cape Hatteras, and has proven successful.¹

The tagged features from the Northwest Cove Site and the Cluster Point Site should be monitored on a regular basis. Using the site maps generated during this project and the feature tags, these sites could be monitored annually to note additional wreck material, and

disappearance or movement of recorded features. This would be a significant addition to the gradually expanding body of knowledge on the natural site formation processes at work on scattered, beached shipwreck sites, which can lead to reliable predictability of the data potential of beached remains.

At the same time that permanent tags are affixed to the site features, timbers at the Northwest Cove and Cluster Point Sites possibly representing structural members should be recorded in more detail. In particular, they should be documented from all sides, which means rolling each one over to expose its underside. This might lead to revised identifications of the timbers and additional construction details. This was not done during this project because I believe that it is important to exhaust all possible avenues of information before disturbing a site. It would have been unacceptable to move the timbers, possibly damaging them, before a complete evaluation of the exposed surfaces was made. Now that this evaluation has been made with inconclusive results, additional information might be gained by recording the hidden surfaces of the timbers. The features that should receive this attention include PB-001, 002, 011, 014, and CP-001, 010, 012, 019, 020, and 022.

It is recommended that a systematic, electronically positioned marine magnetometer survey be conducted in the waters surrounding Point Bennett, Cluster Point, and

Simonton Cove to investigate the possibility of additional hull remains offshore. This is important to determine if the remains recorded during this project are part of a larger body of associated wreckage.

It is recommended that a comprehensive terrestrial magnetometer and metal detector survey be conducted in the intertidal zone of Northwest Cove, Point Bennett, San Miguel Island. Because of the thick layer of sea grass that covers everything in the intertidal zone, a visual survey of the area is difficult and unreliable.

The most important recommendation for future research concerns the *Comet* Site. As soon as environmental conditions allow, the hull remains of *Comet* should be recorded in detail. This wreckage potentially represents the most extensive material from a Hall-built lumber schooner extant. It is important as an archaeological resource and as a significant part of Pacific coast maritime heritage. Unfortunately, there is no way to determine when this site will be exposed to allow documentation. The last exposure was after severe winter storms in 1984; the next could be in a year or in another decade. The most that can be done for the present is to regularly check the site, especially after severe storms, to see if conditions have changed, and to be ready to deploy a documentation team at the first sign of favorable circumstances.

A final recommendation, which does not involve future

research on the sites, is that interpretive materials be developed to give the general public an indication of the importance of these sites in the context of the coastal lumber trade, particularly the Hall Brothers Shipyard's role in that trade. Some possibilities for this interpretive effort are a brochure outlining the lumber trade, the Hall Brothers Shipyard, the three schooners, and the sites; or an interpretive sign at each location on the islands discussing each site. This is an important step toward informing the public of the importance of these shipwrecks as both archaeological and historical sites.

The documentation of the *Comet* Site and the possible *J. M. Colman* and *Dora Bluhm* sites has been an important step in expanding our body of knowledge of a significant part of Pacific coast maritime history. The archaeological record of Hall-built schooners is extremely sparse. There are only two other known wreck sites of Hall Brothers' vessels. The first, the schooner *Reporter*, is located within the boundaries of Golden Gate National Recreation Area, buried under the sands of Ocean Beach, San Francisco. This three-masted schooner was constructed by the Hall Brothers in 1876 and wrecked on Ocean Beach in 1902. A few scattered remnants were examined adjacent to the medium-clipper *King Philip*, which was exposed on Ocean Beach during the mid 1980s.² In addition, a terrestrial magnetometer conducted on the beach in 1987 revealed a large anomaly in the area

where *Reporter* remains are believed to lie.³ With the possible exception of *Comet*, the *Reporter* site represents the most extensive remains of a Hall-built schooner located.

The other possible Hall Brothers' vessel remains were recorded by the North Carolina Underwater Archaeology Unit, just north of Cape Hatteras National Seashore on the beach at Nag's Head, North Carolina.⁴ A section of vessel's side, constructed of Douglas fir and exhibiting construction consistent with late-nineteenth-century practice, was documented in 1979. Historical research revealed that, because of the Pacific coast building material, the remains were most likely those of the four-masted, Hall-built schooner *Bainbridge*, constructed in 1900 and lost in 1929.⁵ Unfortunately, this section of the wreck was removed from the beach and destroyed by the property owner shortly after it was recorded. No further remnants of *Bainbridge* have been observed.

The paucity of vessels constructed by the Hall Brothers in the archaeological record makes the documentation of the three sites at Channel Islands particularly important. Of equal importance, however, is the use of this project as a methodological case study for interpreting isolated features and scattered shipwreck structure. The process of systematically studying and analyzing each element to determine its possible association and identification is the key to understanding scattered, beach shipwreck sites.

The importance of the Pacific coast lumber trade and the principal vessel involved in that trade, the Pacific coast lumber schooner, has been clearly demonstrated. The lumber trade's role in the economic development of California and other regions offers ample testimony to its significance. The importance of the Northwest Cove, Cluster Point, and Comet Sites goes beyond their association with that trade however. These sites represent non-renewable archaeological resources that offer insights into natural site formation processes, isolated element dynamics, and details of late-nineteenth-century construction practices available nowhere else. It is therefore clear that these sites deserve our attention, both to study and to preserve them. This thesis has been the first step in achieving both goals.

NOTES

¹Leslie S. Bright, "Beached Shipwreck Dynamics," paper read at Society for Historical Archaeology Conference, Kansas City, Missouri, 1993.

²James P. Delgado, "Skeleton in the Sand: Documentation of the Environmentally Exposed 1856 Ship *King Philip*, San Francisco," in *Proceedings of the Sixteenth Conference on Underwater Archaeology*, ed. Paul Forsythe Johnston (Society for Historical Archaeology Special Publication Series No. 4, 1985), 30-36.

³Robert L. Gearhart II, *Cultural Resources Magnetometer Survey and Testing Great Highway/Ocean Beach Seawall Project, San Francisco, California* (Austin, Texas: Espey, Huston & Associates, 1988).

⁴Richard W. Lawrence, pers. comm., 1993.

⁵Ibid.

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APPENDIX A

ENROLLMENT AND REGISTRATION DATA:
SCHOONER DORA BLUHM

Registry: 157091

Built: Port Blakely, Washington, 1883

Shipbuilder: Hall Brothers Shipyard

Ownership: 1) Certificate of Registry (no. 33)
William G. Bluhm (1/4), William H. Smith (1/8), Albert Rowe (1/8), Thomas Wallace (1/16), M.M. Buckmann (1/16), Mary A. Redfield (1/16), William I McAllep (1/16), **Winslow G. Hall** (1/16) of San Francisco; Mary Bagley (1/16) of Vallejo; and W.M. Huntoon(?) (1/8) of Eureka.
30 April 1883 - 29 May 1883
William G. Bluhm, Master
First Registration
Port Townsend, Washington

2) Certificate of Enrollment (no. 333)
William G. Bluhm (3/16), Alexander Nicholson (1/16), others same.
29 May 1883 - 15 Sept 1883
William G. Bluhm, Master
Change of owners in part and change of home port
Port of San Francisco

3) Certificate of Registry (no. 15)
Owners same
15 Sept 1883 - 12 June 1884
William G. Bluhm, Master
Change of trade
Port Townsend

4) Certificate of Enrollment (no. 358)
Owners same
12 June 1883 - 11 June 1886
William G. Bluhm, Master
Change of home port and change of papers
Port of San Francisco

- 5) Certificate of Registry (no. 48)
Owners same
11 June 1886 - 26 August 1886
William G. Bluhm, Master
Change of trade
Port Townsend
- 6) Certificate of Enrollment (no. 28)
Owners same
26 August 1886 - 14 Jan 1887
William G. Bluhm, Master
Change of home port
Port of San Francisco
- 7) Certificate of Registry (no. 52)
Owners same
14 Jan 1887 - 23 March 1887
William G. Bluhm, Master
Change of papers
Port of San Francisco
- 8) Certificate of Enrollment (no. 154)
William G. Bluhm (1/16), Henry Moore
(1/8), others same.
23 March 1887 - 5 Jan 1888
Henry Moore, Master
Change of owners in part and change of
papers
Port of San Francisco
- 9) Certificate of Registry (no. 42)
Owners same
5 Jan 1888 - 12 March 1888
Henry Moore, Master
Change of papers
Port of San Francisco
- 10) Certificate of Enrollment (no. 204)
Owners same
12 March 1888 - 5 Jan 1889
Henry Moore, Master
Change of papers
Port of San Francisco
- 11) Certificate of Registry (no. 78)
Owners same
5 Jan 1889 - 10 Aug 1889
Henry Moore, Master
Change of papers
Port of San Francisco

- 12) Certificate of Enrollment (no. 19)
Owners same
10 Aug 1889 - 7 Nov 1889
Henry Moore, Master
Change of papers
Port of San Francisco
- 13) Certificate of Registry (no. 49)
Owners same
7 Nov 1889 - 28 July 1890
Henry Moore, Master
Change of trade
Port Townsend
- 14) Certificate of Enrollment (no. 16)
Thomas Wallace (1/8), Buckmann dropped,
others same.
28 July 1890 - 6 Oct 1890
Henry Moore, Master
Change of owners in part
Port of San Francisco
- 15) Certificate of Enrollment (no. 62)
Frank E. Rensch (1/8), Moore dropped,
others same.
6 Oct 1890 - 23 Dec 1890
Frank E. Rensch, Master
Change of owners in part
Port of San Francisco
- 16) Certificate of Registry (no. 41)
Owners same
23 Dec 1890 - 13 Mar 1891
Frank E. Rensch, Master
Change of papers
Port of San Francisco
- 17) Certificate of Enrollment (no. 145)
Roger Walton (1/8), Rensch dropped,
others same.
13 Mar 1891 - 25 Jan 1892
Roger Walton, Master
Change of owners in part and change of
papers
Port of San Francisco
- 18) Certificate of Registry (no. 60)
Thomas Wallace (1/16), Lewis P. Hearvey
(1/16), Winslow Hall (1/32), Henry
Hall (1/32), others same.
25 Jan 1892 - 22 Aug 1892

- Roger Walton, Master
Change of owners in part and change of
papers
Port of San Francisco
- 19) Certificate of Enrollment (no. 35)
Owners same
22 Aug 1892 - 9 Sept 1892
Roger Walton, Master
Change of papers
Port of San Francisco
- 20) Certificate of Registry (no. 15)
Owners same
9 Sept 1892 - 2 Aug 1894
Roger Walton, Master
Change of trade
Port Townsend
- 21) Certificate of Enrollment (no. 22)
Jacob B. Levinson (5/8) and Sun
Insurance Co. (1/8) of San
Francisco; Edward Lycan (1/8) of
Vineland; William Huntoon(?) (1/8)
of Eureka
2 Aug 1894 - 5 Feb 1895
Jacob B. Levinson, Master (at time of
enrollment)
Peter Rice, Master, 18 Oct 1894 (at Eur)
Change of owners and change of home port
Port of San Francisco
- 22) Certificate of Registry (no. 65)
J.H. Bruce (1/16) of San Francisco;
A.A. Smith (1/16); C.L. Clough
(1/32); A. Dodd (1/8); J.K.C.
Hobbs(?) (1/32); F.W.G. Moebus
(1/16) of Alameda; Joseph Knowland
(1/8) of Alameda; **H.D. Bendixsen**
(1/4) of Eureka; P. Rice (1/8) of
Eureka; O.B. Hinsdale (1/16) of
Gardiner, OR; and William F. Jewett
(1/16) of Gardiner, OR.
5 Feb 1895 - 2 July 1895
Peter Rice, Master
Change of owners
Port of San Francisco
- 23) Certificate of Enrollment (no. 1)
Owners same
2 July 1895 - 22 Aug 1896

- Peter Rice, Master (at time of enrollment)
O.C. Larsen, Master, 15 Oct 1895 (atSF)
Change of papers
Port of San Francisco
- 24) Certificate of Enrollment (no. 34)
Joseph Knowland (1/4), Rice dropped, others same.
22 Aug 1896 - 24 Nov 1896
O.C. Larsen, Master
Change of owners in part
Port of San Francisco
- 25) Certificate of Registry (no. 31)
Owners same
24 Nov 1896 - 8 March 1897
O.C. Larsen, Master
Change of trade
Port Townsend
- 26) Certificate of Enrollment (no. 167)
Joseph Knowland (3/16), O. Christian Larsen (1/16) of Oakland, others same.
8 March 1897 - 16 March 1898
O.C. Larsen, Master
Change of owners in part and change of home port
Port of San Francisco
- 27) Certificate of Enrollment (no. 203)
E.C. Olsen (1/16), Larsen dropped, others same.
16 March 1898 - 19 April 1899
E.C. Olsen, Master
Change of owners in part
Port of San Francisco
- 28) Certificate of Enrollment (no. 244)
N.F.D. Jorgensen (1/16), Olsen dropped, others same.
19 April 1899 - 29 Dec 1899
N.F.D. Jorgensen, Master (at time of enrollment)
Haldor Smith, Master, 12 June 1899 (SP)
Change of owners in part
Port of San Francisco
- 29) Certificate of Registry (no. 50)
Haldor Smith (1/16), Jorgensen dropped,

- others same.
 29 Dec 1899 - 19 July 1900
 Haldor Smith, Master
 Change of owners in part and change of
 papers
 Port of San Francisco
- 30) Certificate of Enrollment (no. 25)
 Owners same
 19 July 1900 - 28 Oct 1901
 Haldor Smith, Master
 Change of papers
 Port of San Francisco
- 31) Certificate of Enrollment (no. 112)
 Joseph Knowland (19/32), C.F. Klitgaard
 (1/16), dropped Bendixsen, Bruce,
 A.A. Smith, Clough, and Haldor
 Smith, others same.
 28 Oct 1901 - 10 Aug 1904
 C. Madison, Master (at time of
 enrollment)
 C.O. Lundbery, Master, 17 Oct 1902 -SP
 Henry Nelson, Master, 14 May 1903 -SP
 Change of owners in part
 Port of San Francisco
- 32) Certificate of Enrollment (no. 24)
 Joseph Knowland (3/8), J.R. Knowland
 (1/16), N.J. Cornwall (1/16) of
 Berkeley, John Hamilton (1/32) of
 Eureka, R.L. Cuzner (1/16) of Los
 Angeles, James Cuzner (1/16) of Los
 Angeles, and J.W. Elliot (1/32) of
 Los Angeles, drop Klitgaard, others
 same.
 10 Aug 1904 - 11 Nov 1905
 Henry Nelson, Master (at time of
 enrollment)
 E. Kallowburg(?), Master, 24 July 1905SP
 Change of owners in part
 Port of San Francisco
- 33) Certificate of Enrollment (no. 88)
 Pacific States Trading Co., of
 San Francisco, George E. Bennet,
 Sec.(7/8); (Joseph?) Knowland
 (1/8).
 11 Nov 1905 - 31 May 1909
 C. Anderson, Master (at time of
 enrollment)

M.G. Kelton, Master, 12 April 1907-SF
 Change of owners
 Port of San Francisco

34) Certificate of Enrollment (no. 249)
 Pacific States Trading Co., Alexander
 Woodside, President
 31 May 1909 - 5 Jan 1910
 H.H. Hansen, Master
 Change of owners
 Port of San Francisco

35) Certificate of Registry (no. 26)
 Pacific States Trading Co., Alexander
 Woodside, President
 5 Jan 1910 - 27 April 1910
 Oscar Johnson, Master
 Change of trade
 Port of San Francisco

36) Certificate of Enrollment (no. 233)
 Pacific States Trading Co., Alexander
 Woodside, President
 27 April 1910 - 25 May 1910
 Oscar Johnson, Master
 Change of trade
 Port of San Francisco

Documents Surrendered: Los Angeles, CA, 31 May 1910

Cause of Surrender: Vessel Lost - Total Wreck, 25
 May 1910, Santa Rosa Island.