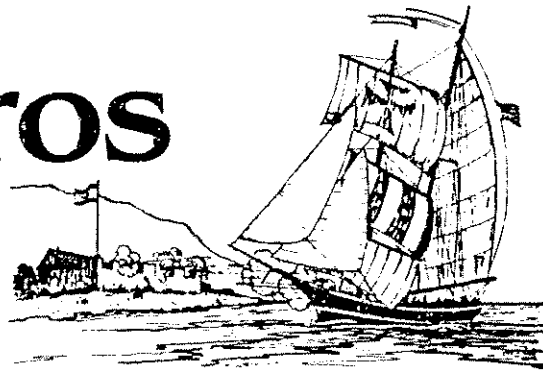
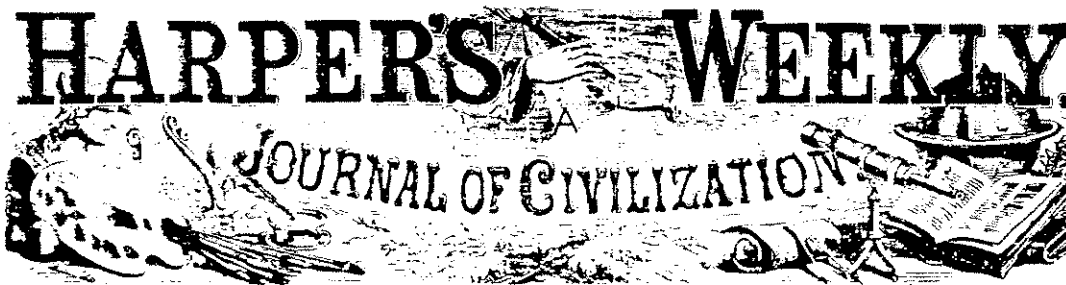


Fort Guijarros Quarterly



FALL 1988

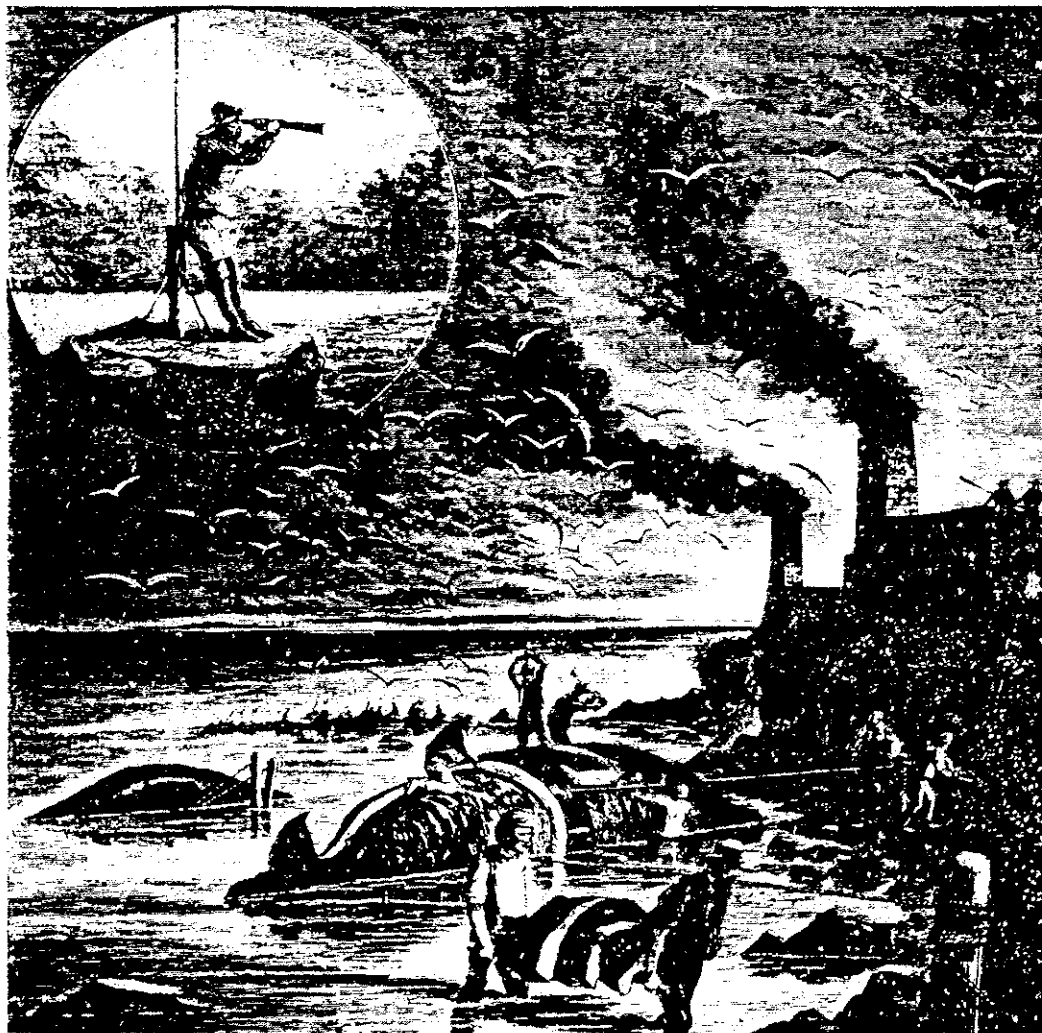
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A non-profit organization incorporated in 1981 to research and promote the heritage of San Diego's old Spanish fort and the subsequent history of Ballast Point in San Diego Bay.

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Historical Background of the Ballast Point Whaling Station

Ronald V. May
Director of Archaeology
Fort Guijarros Museum Foundation

Within the context of a world whale fishery that began in the 16th century and continues today on a limited scale, the twenty-eight year industry on Ballast Point in San Diego, California is significant as a good example of the continuity of pre-mechanized maritime traditions that lasted for four centuries. Ballast Point is more significant in that it is the only known surviving site of a well-documented shore whaling station in the United States.

The social history of the families and their community in mid 19th century California can be used as a model of similar industries known as early as the 17th century in New England and as late as the early 20th century at Monterey, California. The unique aspect of Ballast Point lies in the survival of architectural features and archaeological deposits that have either been destroyed in other maritime sites or not yet discovered archaeologically or reported in the published record.

Ballast Point has survived the ravages of modern construction only because of the unique history of the Military Reservation in the Pueblo Lands of the City of San Diego. Ballast Point had been the site of an 18th century Spanish fort that gained a reputation of fortitude in the 19th century after two ship-to-shore naval encounters. Following the closure of the fort in 1835, its ruins were continuously used by visiting maritimers following the Mexican War of 1846. The United States Army also used the presence of the fort on Ballast Point in a famous land case in 1870 to justify a Military Reservation on Point Loma.

Civilian claimants who believed they owned rights to rent Ballast Point to whalers were significant as early as the 1850s in the legal fight over Point Loma. Eviction of the

whalers and their families to develop United States Army and United States Light House facilities in the 1870s was doomed² by an act of Congress in 1874 and other whalers returned to occupy Ballast Point from 1883 to 1886.

When the United States Light House Service acquired the tip of Ballast Point in 1890, the shore whaling camp was covered with sand and left alone. A few buildings and parking areas constructed by the United States Coast Guard during World War II actually preserved the features below.

The Fort Guijarros Museum Foundation's review of the known archival records confirms that the Ballast Point Whaling Station community was spread all along Ballast Point. In 1930, Winifred Davidson reported a recollection from Mrs. Alonzo E. Horton:

I have always thought a wonderful story could be made of it. . . . The whalers were 1st New Bedford men and came from West Tisbury, Cape Cod. There were two companies. Two brothers Packard and two others named Johnson, on Ballast Point. The Packards had a little shack about the middle of Ballast Point and lived in it; but the Johnsons had a much larger establishment, a big building on the shore near Fort Rosecrans. That was used as dormitories for the whalers.(3)

Davidson also noted "the remains of two old tryout foundations that still stand, the blacked, greasy-saturated soil" was still present on the beach.

The written record has been tracked back to 1857 when the

brothers Prince William and Alpheus Packard arrived in San Diego.⁴ Born in Massachusetts in 1815 to a Portuguese father and English mother,⁵ no record is known of the brother's 42 years prior to their arrival in San Diego. The 1860 Census of Industry recorded their having \$3000 worth of equipment and a crew of ten men. Alpheus and his Indian wife Magdalena lived on Ballast Point until she died in the 1860s. Alpheus then dropped out of the records in 1878. The brothers appear to have lived initially at La Playa, then Ballast Point, where several small operators joined forces between October and May during the whale runs.

The Johnson family operated whaling stations at Cape Colonet and San Martin Island in Baja California.⁶ They also added \$3000 worth of materials and five employees. Henry James Johnson lived on Ballast Point with Saturinia Carravaya and their children John, Sara, and Filbury. Captain Miles A. Johnson was a former sea captain and appears to have been the leader of his family. Henry James and cousin James Johnson were all cousins of Miles.

Research into tax and voter records reveals about thirty men who could have lived and worked on Ballast Point for the Johnsons and Packards. Significant for their own attempts to form companies were Daniel Flanders, John Jenkins, Thomas Lambert, William C. Price, Levi Tilton, and Enos A. Wall. With the exception of Price, who was born in Ireland, all the others came from New England. Lambert and the Packards are known to have been of Portuguese extractions.

The beach operations and layout remain a mystery. An article in the Journal of San Diego History drew analogies from New Zealand and Australia. Other known stations include elaborate communities in Red Bay, Newfoundland in the 16th century, the North Atlantic in the 17th century, and the Northwest Coast

in the early 20th century.

The overall pattern is a complicated network of outpost stations strategically located on points of land where whale herds swam close to shore. From the base station, schooners and smaller vessels shuttled supplies, men, and oil. Ballast Point was the base for outposts in Punta Banda, Puerto Santo Tomas, Cape Colonet, and San Martin Island, Baja California.

When the United States Army evicted the whalers in 1873, Ballast Point remained vacant until 1883. A caretaker also remained in the absence of the military and called the sheriff when necessary to drive off squatters. For some unknown reason, whaling was allowed to resume in 1883 when Captain Enos A. Wall and a man named Plummer built a barracks on North Island and renovated the Ballast Point tryworks. Upon Wall's death in 1884, the company of Higgins & Son continued until 1886.

Since the United States Light House Service assumed ownership of the tip of Ballast Point in 1890, the mysteries that lay below the sands have been protected. Only the occasional water pipe or electrical line have disturbed the remains.

End Notes

1. Neal Harlow, Maps of the Pueblo Lands of San Diego. Los Angeles: Dawson's Book Shop. 1987.
2. Ronald V. May, "Dog Holes, Bomb-Lances, and Devil-Fish: Boom Times for the San Diego Whaling Industry," Journal of San Diego History 32 (Spring 1986):73-91.
3. Winifred Davidson, "Loma Lore," San Diego Scrapbook, Oversize Book #0667, page 10. Research Archives, San Diego Historical Society.
4. May, Dog-holes, 75.
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A Preliminary Report on the Summer-Fall 1988 Archaeological Field Season
at Ballast Point, San Diego, California

Ronald V. May
Director of Archaeology
Fort Guijarros Museum Foundation

INTRODUCTION

The Fort Guijarros Museum Foundation invested 370 person days between June and December, 1988 into an archaeological investigation of a whaling station industrial area on Ballast Point on the U.S. Coast Guard Station in San Diego, California. The Foundation seeks to collect information that can be compared with archaeological recoveries of 19th century whaling data from the ruins of Fort Guijarros, an 18th-century Spanish military fort twelve hundred meters to the west of the excavation site.

Since 1981, the Foundation has excavated in eight areas on the U.S. Naval Submarine Base. All equipment and supplies have been provided by the Foundation. The U.S. Navy has assigned storage space for the equipment and artifact collections. These artifacts are protected in a security cage located in Building 140 of the Submarine Base Headquarters. The Foundation also stores tools and excavation materials in Battery Tunnel, Emplacement Number 2, Battery Wilkeson. This location is a 1898 U.S. Army Coast Artillery structure that has been obsolete since 1942 and which is now on loan to the Mare Island Construction Unit. Graduate students at San Diego State University have undertaken the collections analysis. These graduate students are associates of the Foundation and professionals working in California.

In 1988, the Fort Guijarros Museum Foundation used the research design approved by the U.S. Navy under an Archaeological Resource Protections Act (ARPA) permit to orient the 1988 archaeological

recoveries towards the resolution of history and anthropology problems. The complete implementation of that design must await the analysis of the recoveries.

The Foundation's field strategy was to overlay two areas surrounding the north and west sides of U.S. Coast Guard SAR building with a grid. Brian Smith, a consultant hired by the Navy in 1987, had previously determined through a random test unit excavation methodology that this area might yield promising data. Following Smith's excavation and through assistance from the Navy, the asphalt was removed from a parking lot area that measured 147 square meters. A soil resistivity experiment conducted by Fort Guijarros Museum Foundation crew members narrowed the scope of the lawn area to the west to eighty square meters.

The Fort Guijarros Museum Foundation commenced field work on June 4, 1988. Between June and November, 1988, Fort Guijarros Museum Foundation volunteers excavated a ninety (90) square meter area to sterile soil. Of the 147 possible square meters in the parking lot, forty-eight (48) were excavated. Of the eighty (80) square meters in the lawn, forty-two (42) were dug and the excavation continues to this date.

PROBLEM ORIENTATION OF SHORE
WHALING STATION

The Fall 1987 issue of the Fort Guijarros Quarterly featured an article entitled "The Maritime Tradition of Shore Whaling: Research Implications From Ballast Point in San Diego Bay," by Ronald V. May.

That twelve page article reviewed the history of shore whaling over a period of 150 years in the Pacific Ocean. In this article, May proposed that the whalers' strategy for establishing outpost shore stations linked along remote coastal shorelines originated in Australia and New Zealand and was carried on to Mexico and California in the early 1850s. The economy and adaptive lifestyle of those men and their families who occupied the stations remains largely undefined in either the historical or archaeological record.

The discovery in 1982 of a whaler's midden on top of the ruins of Fort Guijarros was a major find. It provided the first opportunity to examine the remains of a nineteenth century maritime community uniquely adapted to isolated coastal ecozones. The dietary patterns of the mariners, selections in consumer goods from major ports, and interactions with local communities can be examined from analyses of items recovered in the midden.

An example of such information was provided by Paul E. Langenwalter and Daniel A. Guthrie in, "Avian Remains From The Field III Excavations at San Joaquin De La Punta De Los Guijarros" in the Fall 1987 issue of the Fort Guijarros Quarterly. Langenwalter and Guthrie revealed that twenty-seven species of birds were represented in the whaler's midden at this site and that "these specimens provide a unique example of bird use" in a maritime site (Idem. 1987:24). The marine shell and fish bone are still undergoing analysis. The domesticated animal bone has been analyzed and will be published in a future issue of the Fort Guijarros Quarterly.

The ceramics recovered in the 1981 excavation were of particular interest. All were English earthenware and many were transfer prints. This analysis is under re-examination and will be published

at a future date. Several hypotheses have been advanced, one being that the whalers brought their families who decorated their tables with traditional Victorian ceramics familiar to their native homes back in New England. Another was that the 1840 trend in the age of the ceramics indicated an inability of the whalers to purchase contemporary ceramics in the 1860-1870 era during which they occupied Ballast Point. Both hypotheses require further examination of documentary and archaeological materials.

TESTABLE MODELS

Figures 2 and 3 in the Fall 1987 Fort Guijarros Quarterly illustrated models for "the economic network" and "the whaling station system" (May 1987:8,9). Based upon information provided in Michael Pearson's "Shore Based Whaling at Twofold Bay, 100 Years of Enterprise," (Manuscript in the National Parks and Wildlife Service, New South Wales, Australia) and Peter J.F. Coutts' "An Archaeological Perspective of a Whaling Station on Taieri Island, New Zealand" (Paper delivered to the Society for Historical Archaeology/Council on Underwater Archaeology Annual Meeting, Sacramento, California, January 9, 1986) in comparison with Charles M. Scammon's 1875 publication of The Marine Mammals of the Northwestern Coast of North America (New York: Dover Publications, Inc. 1986), these models provide an excellent basis for archaeological testing of maritime adaptation to shore environments on the California frontier.

The Economic Network Model

Shore stations were outposts established on remote coastlines where whales passed close to shore. Financial backers outfitted \$3,000 worth of equipment and supplies to sustain ten or twelve men for eight months between October and May on the

California coast. These backers would appoint an agent at a major maritime port who would receive oil from the base station and send back funds and supplies. A "captain" or other agent kept the books at the base station. These men met and sent out chartered or owned transport vessels among the major port, base station, and outpost stations. Small boats such as sloops ferried oil, men, and supplies between the base station and the outposts.

The source for the financial backing of the various station systems remains a mystery. A chain of circumstantial evidence was suggested in an article in the Fall 1987 issue of the Fort Guisjarros Quarterly (pages 9,10). This suggestion led to the hypothesis that Captain John Pope Davenport developed California shore whaling from bay whaling experience in the South Pacific. His intricate investments in \$500 to \$1000 bonds and licenses for schooners involved in Mexican and Californian whaling was cited as a pattern of behavior that could well have included co-investing in the Ballast Point whaling station. The evidence includes a note in Package 61 of the U.S. Custom House records from Monterey (Bancroft Library) that indicated Master Eliju Avery of the schooner Sovereign sailed for Mexico via San Diego in 1857 to engage in foreign trade in Mexico. That same year, brothers Alpheus and Prince William Packard arrived in San Diego to set up the first whaling station. It is possible that Davenport financed the operation and arranged with his co-partner Avery to drop the Packards and their outfit off in San Diego.

Interest in who these whalers were in those early years has led to the discovery that most of the men registered to vote in San Diego with the notation that they were born in New England. Most of the men were 30 to 45 years of age and listed their occupations as mariners. At least three of the main companies that

shared Ballast Point settled for the season with their wives and children. One of those men married an Indian woman from Santo Tomas, Baja California, Mexico. Newspaper accounts also revealed that replacements generally came from San Francisco, as did regular supplies on the Pacific Mail Steamship Lines.

The success of the stations is difficult to measure. In 1865, a court seizure of property at Ballast Point hauled in 200 barrels of oil to pay off an outstanding debt. Because of the effect of the American Civil War, oil sold in Boston at that time at \$1.65 a gallon, or about \$512 a barrel. The confiscation represented only a small part of that year's oil recovery from the entire season. On the surface, this would suggest an incredible amount of money in the whaling business. The value of oil in California, however, would have been considerably less than in Boston. Moreover, the various companies that owned shares in the co-mingled assets all shipped their oil on the same company transports. Still, the agents and the backers probably recovered a great deal for their investments. After the Civil War the price of oil depressed as the economy base shifted from cattle to real estate and general commerce. While the Packard and Johnson Companies expanded their operations with investment capital, lobbyists urged the development of New Town, the coming of the railroad, and major seacoast military defense.

In 1873, the U.S. Army evicted all the whalers from Ballast Point to construct a fifteen-gun artillery fortification. Even after Congress cut the project's funding, a civilian caretaker remained on Ballast Point until 1883 to drive off sailors and fisherfolk. In that year, veteran Packard Company whaler Enos Wall arrived in his schooner Sierra and announced plans to resume whaling at Ballast Point under the company of Wall and Plummer. Ballast Point was a popular spot to visit with touring

yachts, and Higgins and Company swiftly replaced Wall and Plummer when Enos passed away in 1885. But the heyday had by then passed and in 1886 the last whaler departed Ballast Point, never to return.

Archaeological research at this outpost community on Ballast Point affords an almost unique opportunity to study the processes of adaptation by Victorian New Englanders to isolated environments. The shipping networks and flow of goods from the major ports across the nation, and perhaps across the seas, can be compared to other frontier situations where Victorian Americans adapted to desert and mountain environments. The evidence of diversification of species of edible birds reported by Langenwalter and Guthrie should be examined in the studies of fish, mammal, and other food materials. It would be ideal, as well, to compare these data with food practices of Victorian Americans in other coastal communities such as fishing and lumber sites to test the relative distinction of the behavior pattern.

Whaling Station System Model

The brief review of the economics of the greater network from Mexico to California reveals that the whaling stations were very complicated operations that involved a series of stations along a coastline over many miles. Ballast Point usually had two separate companies side by side. The Packard Company consisted of at least one married family and about ten men. The Johnson Company, which operated on Ballast Point in the 1870s, consisted of one married family, two Johnson cousins, and a crew of seven to ten men. Over the years, other companies joined or left the two primary companies. In 1873, all the companies were evicted by the U.S. Army. In 1883, an old Packard employee, Enos Wall, returned to San Diego to operate the Wall and Plummer Co. He was replaced by Higgins and Son in 1885. All operations ceased

in 1886. It is likely that only one agent managed the transshipping of oil, men, and supplies between San Francisco and Ballast Point at any season. The casks of oil were marked by company and individuals' shares.

The base station was usually a large residential community, which in the case of the New Zealand stations consisted of local Maori villagers. At Ballast Point, it seems to have been mainly New Englanders and a few Chinese fishermen. The community would have consisted of a warehouse, cooper and blacksmith shops, small boatyard, several barracks, several homes for the married families, an office and a store, gardens and livestock areas. A separate oil-rendering tryworks oven would have served each company. The residents would have hauled water to Ballast Point from a spring located across the bay on North Island. When whaling companies resumed operation in 1883, the whalers lived on North Island.

The primary activity area for each company was the "tryworks" where the whalers boiled the blubber into oil. The process involved killing with exploding harpoon lances, pulling the whales around to calm waters, and then hooking the bodies up to a capstan secured on the beach. The crews then hauled the animals to shallow water. A team with long knives would cut the blubber into chunks, haul it to a work area to be minced into thin slices, and then feed it into huge iron cauldrons that were usually set in large masonry ovens heated by burned whale skin and fried out blubber. The oil was then skimmed in ladles and poured into oak casks of a variety of sizes and capacities. Coopers constructed and sealed the casks after it cooled in small tubs. Other men would roll the barrels to the warehouse area to be marked and accounted by the station agent or captain.

Foundation research has demonstrated that at least two outpost stations were regularly

maintained in the whaling station system linked to Ballast Point. About 100 miles south was a point of land called Punta Banda and fifty miles more distant was Santo Tomas. Newspaper accounts from the period repeatedly mentioned each location. In 1872, the Johnson Company operated at Punta Banda and the Packard brothers split between Ballast Point and Santo Tomas. That year more oil than ever before had been recorded in shipments to San Francisco. Unfortunately, the U.S. Army evicted the whalers in 1873 to construct an artillery fortress on Ballast Point.

HYPOTHESES

markets, but rather subsisted on preserved foods. While this would not prove the source as San Francisco, it would suggest lesser interaction with local markets. Conversely, low frequencies of commercial containers and high frequencies of domesticated meats, wild game, and marine foods might suggest greater dependence upon the local markets for food sources. This latter inference would also indicate some affluence among the whalers.

1. The economic network model provides a framework within which artifactual collections of supply containers, metal hardware, and personal goods can be analyzed to study the quality of life experienced by the inhabitants of remote base and outpost stations. This level of information is not available in the documentary record.

3. The whaling station system model provides a framework to test the functional organization of the use of Ballast Point by the whalers. Excavation in various points should reveal if the community was as complicated as portrayed earlier in this research design or more localized and less of a residential community than in New Zealand.

2. The economic network model provides an explanatory method to discriminate supplies from the major supply center in San Francisco from the local supplies obtained in Old Town San Diego. The quantity of outside goods purchased and used by the whalers should hint at the level of dependence upon the agents in San Francisco. For example, the documentary record has not revealed if the whalers received payment incrementally over the season or at the end. The key would be to distinguish container goods that were exclusively supplied from sources in San Francisco. High frequencies of tinned and glass food containers and low frequencies of domesticated meats would suggest that the whalers did not purchase perishable food from the local

4. The whaling station model provides an opportunity to examine an isolated community of New England maritime families in the early frontier period of California. Their selection of personal items, decorations, and food consumption varieties should reveal Victorian values transported from distant homes. Evidence for a unique behavior pattern was revealed in the ceramics which proved in the 1983 excavation and publication in the Summer 1987 issue of the Fort Guijarros Quarterly to be primarily English earthenwares.

5. The whaling station model provides a unique opportunity to examine the adaptive dietary patterns of mariners in the 19th century. Since most whaling operations were ocean-going, the residue from their meals was pitched overboard and lost. However, the men who lived in the

barracks and in the private residences at Ballast Point dumped their refuse out entrances and on the beach around their homes and work areas. The greasy gray sand exposed in the 1982 excavation contained bird and fish bone, marine shell, and saw-cut animal bones from the meals of the whalers. Statistical counts of these specimen collections can provide direct evidence that can not be found in the documentary record. The report by Langenwalter and Guthrie in the Fall 1987 issue of the Quarterly has revealed an astounding variety of shore and pelagic species of birds that were clearly consumed.

SAMPLING PROCEDURE

Brian Smith's 1987 work revealed that the entire test area had been covered by a thin to thick layer of yellow marine sand once excavated from Point Loma and poured around the SAR building to bring a lawn and parking lot to a level elevation. Directly under the yellow sand was a soil and cobble deposit containing diagnostic artifacts of a pre-1900 maritime tradition. White clay pipe fragments and hand-wrought bronze nails link the deposit to the midden on top of the ruins of Fort Guijarros. Smith had interpreted a black-stained soil layer as "whale oil." He used four test pits excavated by his team to predict the size of the deposit and suggested that it be "salvaged" prior to disturbance.

The sample size, however, was too small to accurately predict the deposit size or complexity of features within the area. After the asphalt had been removed, potentially rich areas up to six meters north of the SAR building became evident. This was considerably larger than the tests had supported. The Fort Guijarros Museum Foundation used a strategy of gridding out the entire

parking lot and lawn areas in two meter squares with one meter balks in between (Figure 1). The two meter squares were then targeted for excavation. The balks were left in place for vertical control. All of the elevations were shot-in by a trained surveyor from a datum established in 1962. The datum was located at the old U.S. Lighthouse Service flagpole located on Ballast Point (V784).

For practical purposes, the parking lot was excavated first and the lawn area second. The parking lot area was measured into four quadrants and teams of four people were assigned to each. The four teams received a color code for their notebooks and correspondingly colored mapping flags for their quadrants.

The teams assigned to the east half of the parking lot area had to remove from 0 to 20 centimeters of yellow marine sand (Locus 1) before encountering the culture-bearing strata (below) (Locus 2). In the west half of the parking lot, Locus 1 ranged from 40 to 90 centimeters in depth, as the land sloped west to the water line. Because of the unstable condition of Locus 1, all of the soil in the west half was removed, except along the wheel barrow route. Ultimately, the crew removed approximately fifty (50) cubic meters from Locus 1 in the parking lot area.

Prior to the subsurface excavation of Locus 2, each team micro-mapped the relative location of every artifact, fragment of shell, and animal bone in evidence in their units. This was accomplished by poking a color-coded flag into the soil adjacent to each find. They then used measurements from the grid lines to plot and record each artifact into their field notebooks on scaled graph paper. Each plot was recorded in a list by the same sequential number as placed on a plot map. The depth of each artifact and level was measured from sub-datum points in the west half where Locus 2 dropped toward the waterline of San

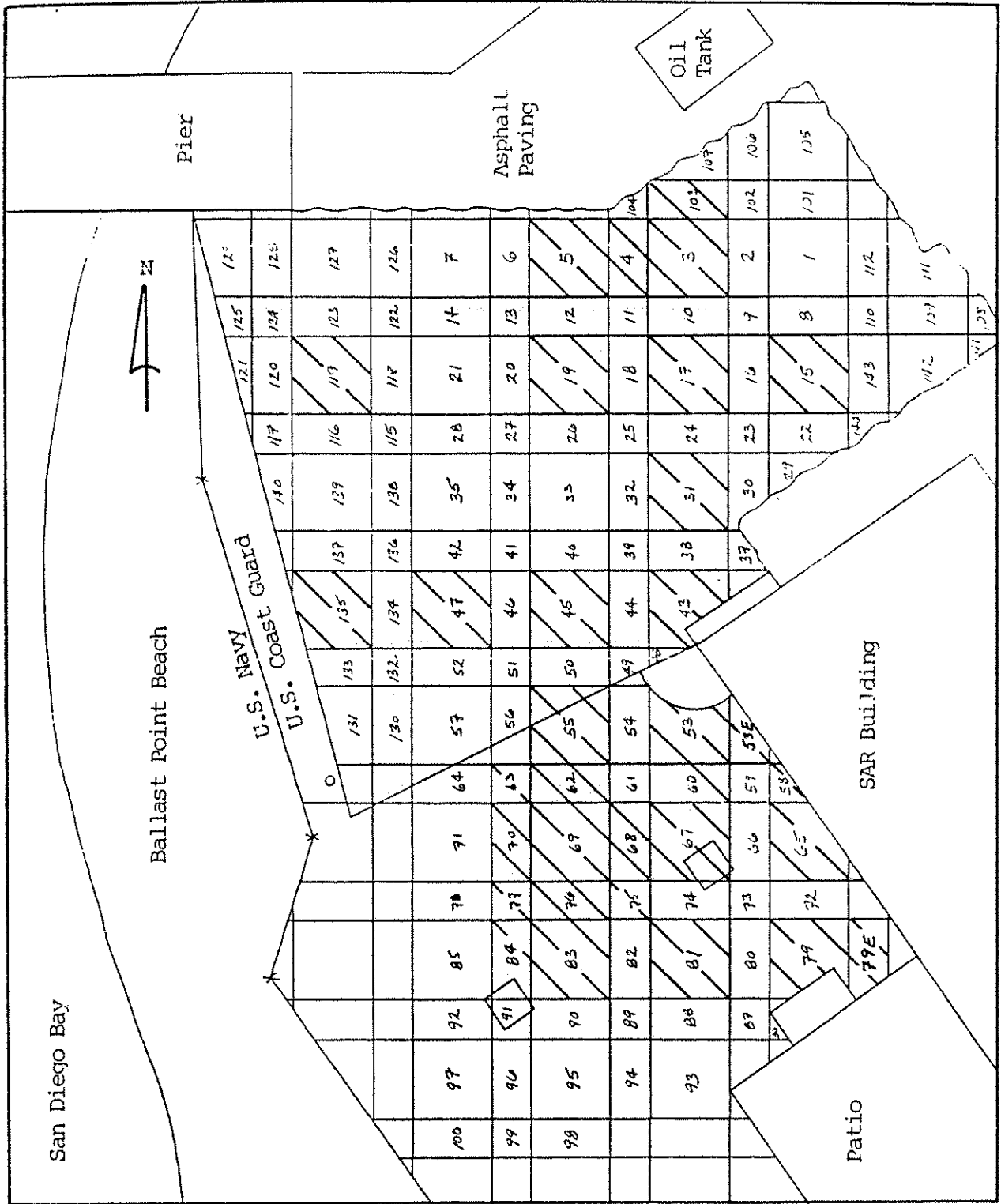


Figure 1. 1988 Ballast Point Excavation Grid Layout.

Diego Bay. The teams marked each of these provenience numbers with indelible ink onto zip-locked plastic bags and then placed the items inside, one bag for each plot. The southwest quarter was also recorded and contour-mapped by the Red Team to document a section of the old ground form that had existed prior to leveling with Locus 1.

The surface of Locus 2 in the parking lot sloped downhill to the south and west and uphill toward the lawn area. The excavations in the lawn area revealed a relatively uniform Locus 1 that ranged from fifteen (15) to twenty (20) centimeters thick. The lawn provided stable support for Locus 1 in the balks. Therefore, the lawn area initial strategy called for a continuation of the excavation of the two by two meter units, but leaving the one meter wide balks to provide vertical control for profiling.

A revision of this strategy became necessary when excavation exposed two architectural features in the lawn area that extended under the balks. After exposing a tile platform in Units 53 and 65 it was necessary for the crew to remove Locus 1 of balk units 58, 59, 60, and 66. The discovery of foundations and fire holes of a tryworks oven two meters west of this feature caused the removal of Locus 1 of balk units 62, 63, 68, 70, 75, 76, 77, and half of 74, around the larger units 69 and 83.

It is interesting to note that the 1987 test units entirely missed both features, while the Fort Guijarros Museum Foundation's soil resistivity meter tests detected densities in roughly the same areas as the feature locations. These results demonstrate the ineffectiveness and high probability of missing significant resources by the small test area excavation procedure.

STRATIGRAPHIC SOIL TRANSFORMATION PROCESSES

Archaeological investigation revealed that nineteenth-century people artificially elevated the landform at the tip of Ballast Point. Locus 2 in the east half of the parking lot area and throughout the lawn area ranged from forty (40) centimeters to ninety (90) centimeters thick. It was composed of 85% to 100% cobbles with some artifacts and charcoal filtered in the spaces. The sterile layer below was distinguished by white beach sand among beach cobbles and no cultural material.

Parking Lot Area

Locus 2 characteristically comprised two layers that varied in thickness across the east half of the parking lot. When present, Layer 1 was a medium gray consolidated sand flecked with bits of charcoal and tiny fragments of marine shell. Most of the artifacts and bone in Locus 2 was found in Layer 1. Layer 1 ranged from five (5) to twenty (20) centimeters thick. About 85% of Layer 2 was comprised of fist-sized cobbles. The spaces in between the cobbles were often vacant, but some gray soil and increased quantities of charcoal filtered down from Layer 1.

Blue Team exposed a burned platform feature in Units 3, 4, and 5 (Figure 2) that provided strong evidence that Locus 2 had been deliberately laid down in one episode. Under the feature, Locus 2/Layer 2 was devoid of soil, charcoal, or artifacts. The elevation of Locus 2/Layer 2 was relatively the same as Locus 2/Layer 2 in surrounding units that contained gray soil, charcoal, and artifacts. This observation suggests that Layer 2 was deposited in one episode and Layer 1 represents the primary surface of cultural activity. Those voids among the cobbles in Layer 2 that were not sealed by features were

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gradually filled by debris from Layer 1 that filtered down during activities following the initial deposition.

Lawn Area

Locus 2 in the lawn area was different from Locus 2 in the parking lot area. Smith noted this difference in 1987 and described the locus as a dark brown "oil-stained" sand. Further excavation in 1988 revealed the dark layers to have been deposition of various waste by-products from the tryworks oven feature. In fact, charred material from the tryworks oven stained the sand in Locus 2/Layer 1 throughout the lawn and parking lot areas. The differences characterized proximity to the tryworks oven.

Uniformly throughout most of the lawn area, Locus 2/Layer 2 lacked cultural materials. Occasional artifacts had filtered down in Locus 2, but they were unusual.

The exception to the usual pattern of Locus 2/Layer 2 was found in Unit 53 at the north end of the west face of the SAR building and Unit 43 outside the planter at the west corner of the north face of the building. The excavation crews found the largest number of "personal" artifacts throughout the test area from this five-meter wide area. These artifacts were scattered among a great deal of charcoal fragments and were loosely consolidated among the cobbles.

As in the parking lot area, Layer 1 of Locus 2 appear to have been the working surface or an area of heavy foot traffic following deposition of Layer 2. This is confirmed by the location of the base of the tryworks oven foundation, the top of a concrete-filled post hole in Unit 83, and the level of the tile platform feature adjacent and under the west wall of the SAR building. The discovery of several cobbles attached to oyster shell in Unit 67 suggested



Figure 2. Excavators cut through the Burned Tile Feature in Unit 5 to expose a cross-section in the east unit wall. Below lay a twenty centimeter thick layer of cobbles devoid of artifacts in the air spaces. The char-black fired clayey mud was ten centimeters thick and impressed with Spanish tile shapes. Tile fragments littered the surface.

further evidence of the man-made episode for Layer 1. Oyster are a shallow water bivalve that did not naturally occur on the surface of Ballast Point. No water-wear was evident, as would be found on wave deposited marine shell.

Between the time of activities associated with the features in Layer 1 of Locus 2 and the deposition of the marine soil of Locus 1, activities associated with the U.S. Lighthouse Service after 1890 impacted the surface and penetrated Layer 1 of Locus 2. This is less evident in the lawn than in the parking lot.

The west half of the parking lot area dropped fifty (50) centimeters in a span of six meters. The contour map that will be produced in the southwest quadrant from data recovered by Red Team will demonstrate this slope toward the waterline of San Diego Bay. At high tide the distance is only four meters from the crest of the drop. Excavation crews found high concentrations of red-lead marine paint, water-worn and fire-melted glass from the early 20th century, fire-affected lens of rusted wire nails, and brass screen in this area. The Yellow Team recovered even higher quantities of similar glass in the northwest quadrant.

Locus 2 in the west half of the parking lot area measured about twenty (20) centimeters deep. The mix of 19th century hand-wrought ship nails among early 20th century burned and water-worn artifacts indicates that this area was scoured by incoming tides, occasional rough weather and boat maintenance activities.

LOCUS 2 FEATURES

The archaeological field crews exposed four features in Locus 2. These features were all in Layer 1 and soil below Layer 2 was devoid of cultural material. A fifth "feature" is actually a cluster of higher

density artifacts over a five meter area at the northwest corner of the SAR building.

PARKING LOT AREA

BURNED TILE FEATURE

A "burned tile feature" in Units 3, 4, and 5 (Figure 2) in the northeast quadrant measured roughly two (2) meters across and ranged from ten (10) to twenty (20) centimeters thick. (See Sketch 1). The original construction involved a layer of wet clayey mud that formed a foundation for a mosaic of broken Spanish tiles impressed into the surface. These sandy, low-fired clay tiles are identical to rubble exposed in the ruins of the 18th century Spanish "Fort Guijarros" located 1200 feet west on Ballast Point. A large caliber rim-fire rifle shell was found in close association to Layers 1 and 2 and the feature. A horseshoe, a china button, and several brass pins were also discovered adjacent to the west side of the feature. All had been subjected to intense heat and most of the tiles were shattered and scattered around the original impressions that had been fired hard by the heat. The clayey mud exhibited uniform charcoal-black throughout, clear evidence of oxygen contact at the time of the firing. A cast iron drain pipe disrupted the east half of the feature and may have been installed at a later time, as it was mostly above the feature.

The burned tile feature probably functioned as a heat-reflection structure to an outdoor fire. The feature was crudely made and slapped together with tiles salvaged from the Spanish fort. The bullet shell suggests an 1860 to 1880 time frame. Several hypotheses can be advanced from this evidence. The feature pre-dates the 1890 U.S. Lighthouse Service and probably is contemporary with a similar tile platform in Locus 2 of the lawn area. It probably

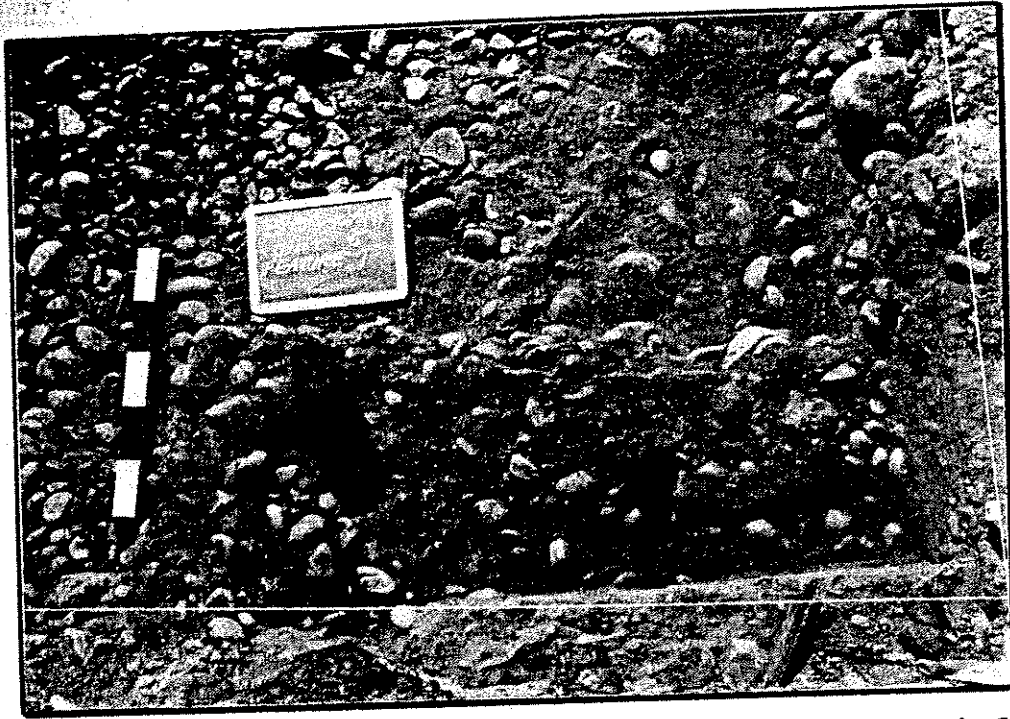


Figure 3. This overhead picture illustrates the "Orange Sand Structure." Below the chalkboard is the square redwood post. The dark area to the right is the redwood sleeper.



Figure 4. The tile platform extends under the west wall of the SAR building. The irregular shapes of Spanish tiles fitted in a mosaic reveal the reuse of tiles salvaged from Fort Guijarros about 1200 feet west.

served as a hearth for people working on boats near the water. It could also have been the location of a "fat-lean pot where sailors not working for the companies would have rendered oil from whale meat and other scraps abandoned by the whalers. Just such an operation at Ballast Point was described by Judge Benjamin Hayes in the 1860s.

ORANGE SAND STRUCTURE

A corner of an unknown structure was exposed in the northwest corner of Unit 5 (Figure 3). A square redwood post that measured ten (10) centimeters on a side was sunk into an orange sand trench fill. The trench was laminated with the orange sand and a light brown sand (Sketch 3). Redwood sleepers crossed the top of the south trench fill and parallel twenty (20) centimeters north and inside the structure. This strange appearing structural remains was very close to two tall structures that flanked the entry of a wooden pier or wharf seen in a 1910 photograph from the San Diego Historical Society collections. The wharf seems to have been the same one in the 1890 photograph. The orange sand structure was probably a corner of one of the 1910 structures. A trash pit cut through Locus 1 at a sixty degree (60) angle into the trench. It was filled with splintered lumber and grey gravel.

LAWN AREA

TILE PLATFORM

A platform of crudely placed broken Spanish tiles and flagstone slabs was exposed in Units 58, 59, 60, 65, and 66 in the lawn area (Figure 4). It measures two meters wide and disintegrated into a ragged edge one and a half meters west of the west wall of the SAR building. It is about ten (10) centimeters under the bottom of the foundation of the SAR building. Earth separated

the tiles and there was no evidence of burning. A test trench dug through the platform revealed Locus 2/Layer 2 to be devoid of artifacts below the tiles.

The tile platform was crudely constructed by laying a mosaic of broken tiles, flagstone, and a few cobbles to form a rectangular and relatively level surface. No artifacts could be found associated with the original surface, although an iron rod intruded through the tiles, uplifting one piece slightly. The rod appeared to have been added long after use of the platform.

Unit 67 and one of the 1987 test units missed this feature. Other than scattered tiles, the char-black layers of burned organic material, and a depression in the west half of Unit 67, no evidence of the feature was found to the west. Nothing was found to the south. Unit 53 yielded high quantities of artifacts just north of this platform. The tryworks oven feature is three meters to the west and at the same level.

The tile platform appears to have been laid down in a regular dimension. This suggests deliberate architecture, although the selection of tile fragments and flagstone indicate a temporary nature. One interpretation proposes that the surface maintained adequate support and traction to haul heavy objects over an otherwise slushy surface. Another is that the surface was a floor under a ramada. The high density of personal items in Unit 53 north and just off the platform could have been swept off the surface or have been a rest area outside the front of the ramada.

TRYWORKS OVEN FOUNDATION

A large tryworks oven foundation was uncovered in the center of the lawn area (Figures 5 and 6). The foundations had been laid with large irregular consolidated sandstone blocks. Shaped in a slightly oval outline, the dual oven entrances were

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Figure 5. This overhead picture (looking northwest) illustrates the tryworks oven foundation in the lawn area. The parking lot excavation area is north of the oven, and the shore of San Diego Bay can be seen in the distance.

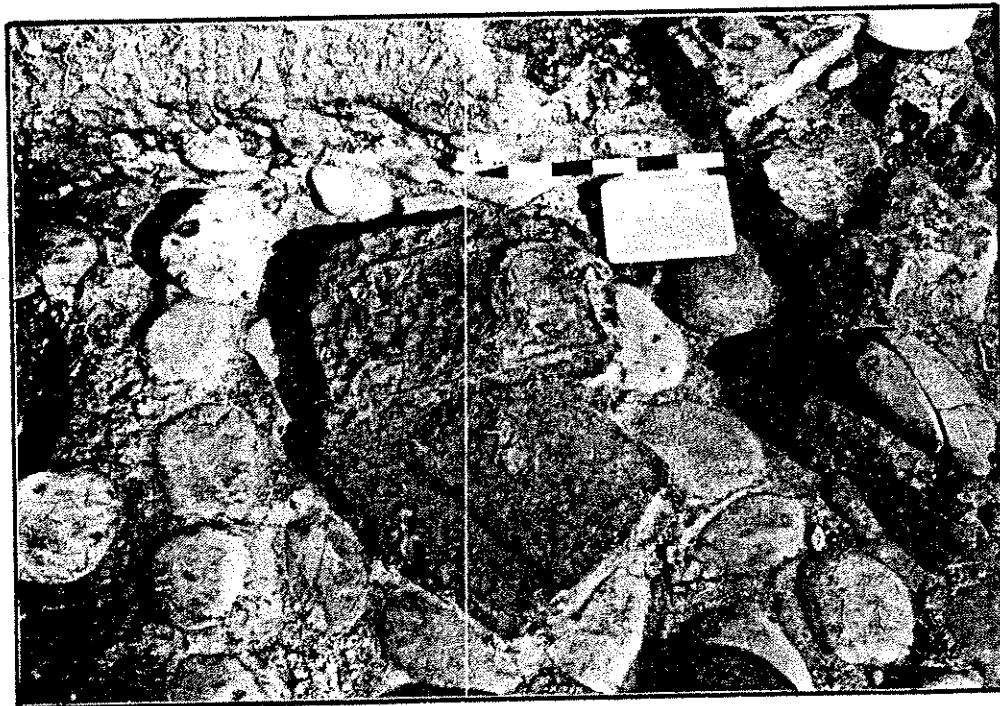


Figure 6. With north to the left, this picture correlates to the "Metal Box Feature." The lower "box," "tray," or "door" lay directly on top of the flat cobbles and the one above was partly on white beach sand. White beach sand covered these stones up to the foundations.

in a flat wall on the north. The foundation measured four (4) meters deep from that front to a convex back wall exterior. The slightly convex sides measured roughly four (4) meters wide.

The tryworks oven was designed for two tear-drop shaped fire holes, located side by side and separated by a wall of smaller sandstone blocks than were used for the exterior foundation. The openings were at the narrower ends of the fire holes. Flat sandstone cobbles, slightly tilted toward the fireholes, gated these openings (Figure 8). A charred and vitrified black substance stained these cobbles. Outside the entrance, vitrified sand and charred organic material measuring two (2) to five (5) centimeters thick flowed out in an alluvial fan over a bed of white sand.

The exterior ground outside the entrances to the fireholes formed a man-made "porch" that had been constructed on top of the artificially laid cobbles. As in the other features, the Locus 2 cobbles were found to be devoid of cultural material below the feature. The porch was created from a mosaic-pavement of large flat sandstone cobbles that had been set side by side in a rectangle which extended the two (2) meter length of the front of the tryworks oven. This "porch" measured one and a half (1.5) meters out the front of the oven entrances. The layer of white beach sand covered the cobbles. Black organic stains penetrated half way to the cobbles where the sand contacted the oven entrances.

Two "metal boxes," or "trays," or "doors" were discovered forty (40) centimeters north of the entrance of the east firehole (Figure 9). One lay directly on top of the cobbles beneath the sand. The other lay partly across the southeast corner of the lower box and was otherwise separated from the cobbles by sand. The boxes measured twenty-eight (28) centimeters long by twenty (20)

centimeters wide. They were so badly rusted that the metal crumbled when the dig team attempted to remove them.

The interior bottom of the fireholes consisted of a very dense vitrified sand that exhibited a blue-black sheen when freshly broken. This bottom sloped slightly downward toward the back. When the excavation crews cleared away the rubble, the east firehole was then measured to be twenty (20) to twenty-five (25) centimeters below the top of the foundation.

At this writing, only the east half of the tryworks oven foundation has been exposed. From the entrance of the east firehole, the exterior foundation measured seventy (70) centimeters wide. At the rear side of the exterior where the wall curves to the back it measured ninety (90) centimeters wide. The installation of a modern sprinkler pipe has disrupted the back foundation wall, which appears to have once been roughly seventy (70) centimeters thick.

The rubble fill in the east firehole provided evidence that the upper structure had been constructed of English-style common bricks. About twenty (25) fragments were jumbled among fieldstone, sandstone, flagstone, and cobbles. One brick remained laid between the foundation stones in a black burned soil mortar. The vast majority of the upper structure appears to have long since been scavenged. Heavily patinated amber bottle fragments scattered about the top of the rubble are significant to dating the tryworks oven foundation. An amber glass bottle neck with a hand-applied lip was found just outside the east foundation wall. This bottle post-dated the termination of the feature.

A redwood post (3"x3") set in concrete was discovered adjacent about ten (10) centimeters south of the exterior of the back foundation. The top of the concrete was found to

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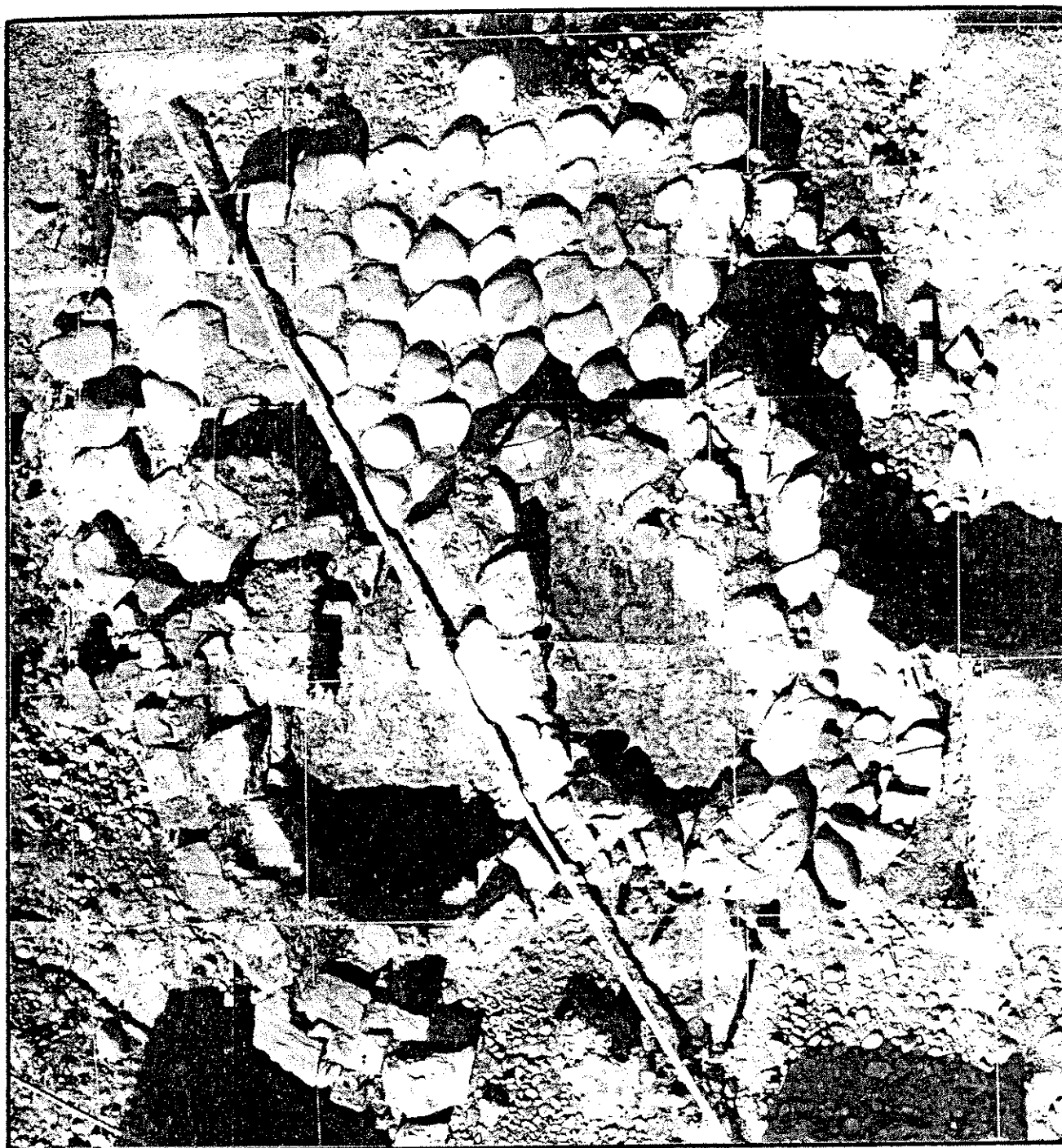


Figure 7. Overhead photo mosaic of the tryworks oven foundation showing the two fire holes and the flat cobble "porch" to the north. A white plastic sprinkler pipe cuts through the feature.

be level with the foundation stones.

A rusted, flat metal object on top of a length of wood was found just off about fifteen centimeters to the northeast of the corner of the tryworks oven foundation. This area has yet to be exposed by the excavation crews.

An outer wall of over-lapped rectangular Spanish tiles was discovered around the western exterior of the tryworks oven. This outer wall lends an arc-like appearance to the exterior shape. This element of the tryworks oven did not extend to the back wall.

The rubble fill in the west firehole has not yet been completely recorded or removed. There appear to have been an even mix of fragmented Spanish tiles, English-style common bricks, rocks, and some cobbles in the rubble. A few large chunks of iron also lay on top.

THE ARTIFACT CLUSTER

Two units excavated through Locus 2 around the northwest corner of the SAR building and immediately north of the tile platform contained substantially higher quantities of personal artifacts than were found elsewhere on the entire site. These personal artifacts included bone and white porcelain buttons, white clay smoking pipe fragments, purple glass medicine bottle sherds, and munition casings.

Although no artifacts were found on top of the adjacent tile platform, the unusually high frequency of items found north of the platform and one (1) to three (3) meters east of the front of the tryworks oven entrances suggests that the whaling work crews may have rested in this area. Their foot traffic may have caused the debris to filter among the cobbles.

The white clay pipe styles represented in this area generally date in the 1850 to 1880 era. The .45-.70 munition casing and a Colt ball cartridge date in the late 1870s to 1880s. The purple glass medicine

bottle fragments with the hand-applied lips date in the 1885 to 1915 period. Taken together, this feature probably dates in the 1880s.

THE ARTIFACTS AND OTHER SAMPLES

Given the overall short time frame in which the excavation crews were allowed to conduct the field investigations before the planned construction was scheduled to begin, all labor was by necessity assigned to excavate and conduct data recordation. Upon completion of the field work, crew members will clean, catalog, sort, analyze, and prepare the bagged collection of artifacts for statistical manipulation to address the research-designed questions and hypotheses.

THE RESULTS

The 1988 archaeological field season at Ballast Point recovered a substantially large sample of information from the parking lot and lawn areas. Roughly thirty percent (30%) of the parking lot area was sampled and fifty-five to sixty percent (55-60%) of the deposit in the lawn area was recovered. Only the lawn area yielded truly significant archaeological features.

The results of the excavations reveal that the northwest corner of Ballast Point was the site of one of the few confirmed shore-whaling stations in California. Synthesis of the data from this excavation will better explain the physical layout of a tryworks industrial area that was never documented in the written record. The measurements, description, and photographs of the tryworks oven will provide a unique record to be used by historians and archaeologists in the years to come.

Both the photographic record of the 1890s and the archaeological excavation will help interpret the overall layout of this shore whaling station. Photograph #10869 in the Photographic Archives of the San

Diego Historical Society recorded the conditions of Ballast Point from an offshore boat prior to the construction of the U.S. Lighthouse Service facilities in 1890. The U.S. Army Corps of Engineers had not been on the U.S. Military Reservation since 1874 and never built facilities on the tip of the point. Yet the photograph clearly depicts two large white-washed barn or warehouse structures. A small wharf extended out into San Diego Bay in much the same location as the current pier, adjacent to the northwest corner of the archaeological investigation. A low mound or bush formed a dark shadow next to a small square building in vicinity of the parking lot. The shore whaling companies that used Ballast Point from 1883 to 1886 probably built these features.

The evidence suggests that either the Plummer & Wall Company (1883-1885) or Higgins & Company (1885-1886) constructed or re-used a large, elevated cobble pad that extended about twenty-five (25) meters across the top of Ballast Point. It supported an industrial work area to render whale oil. The historical record indicates that the large tryworks oven might pre-date Enos Wall to the days of the Packard and Johnson companies. The companies of the 1880s erected barracks near freshwater springs on North Island and sailed over to work on Ballast Point.

The portion of the whaling industry uncovered thus far on Ballast Point suggests that between 1857 and 1886 various companies operated at locations along Ballast Point. Similar artifacts to those in the artifact clusters at the northwest corner of the SAR building were found in 1981 among whale bones in a shell midden on top of the ruins of Fort Guijarros. Ceramics and glass date that deposit to the 1860s. The tryworks oven could have been reused by several of those companies over the decades of the late 19th century.

The oven would have been a two (2) cauldron structure set in brick and fieldstone masonry. Each cauldron probably had a capacity for 150 gallons. Common both on ships and shore, the cauldrons had flattened sides to fit snug together and share the benefit of the heat from the fire holes below. Men with long-handled skimmers would have removed "whale-fritters" from the oil and either pitched them in the waste piles to the sides and rear or into the fire holes below. Other men with long-handled scoops would have ladelled out the oil into cooling pots. Then coopers would pour the oil into wooden casks which they would then seal and mark with codes for ownership. The casks would then be hauled off to warehouses to await later transport to the San Francisco market.

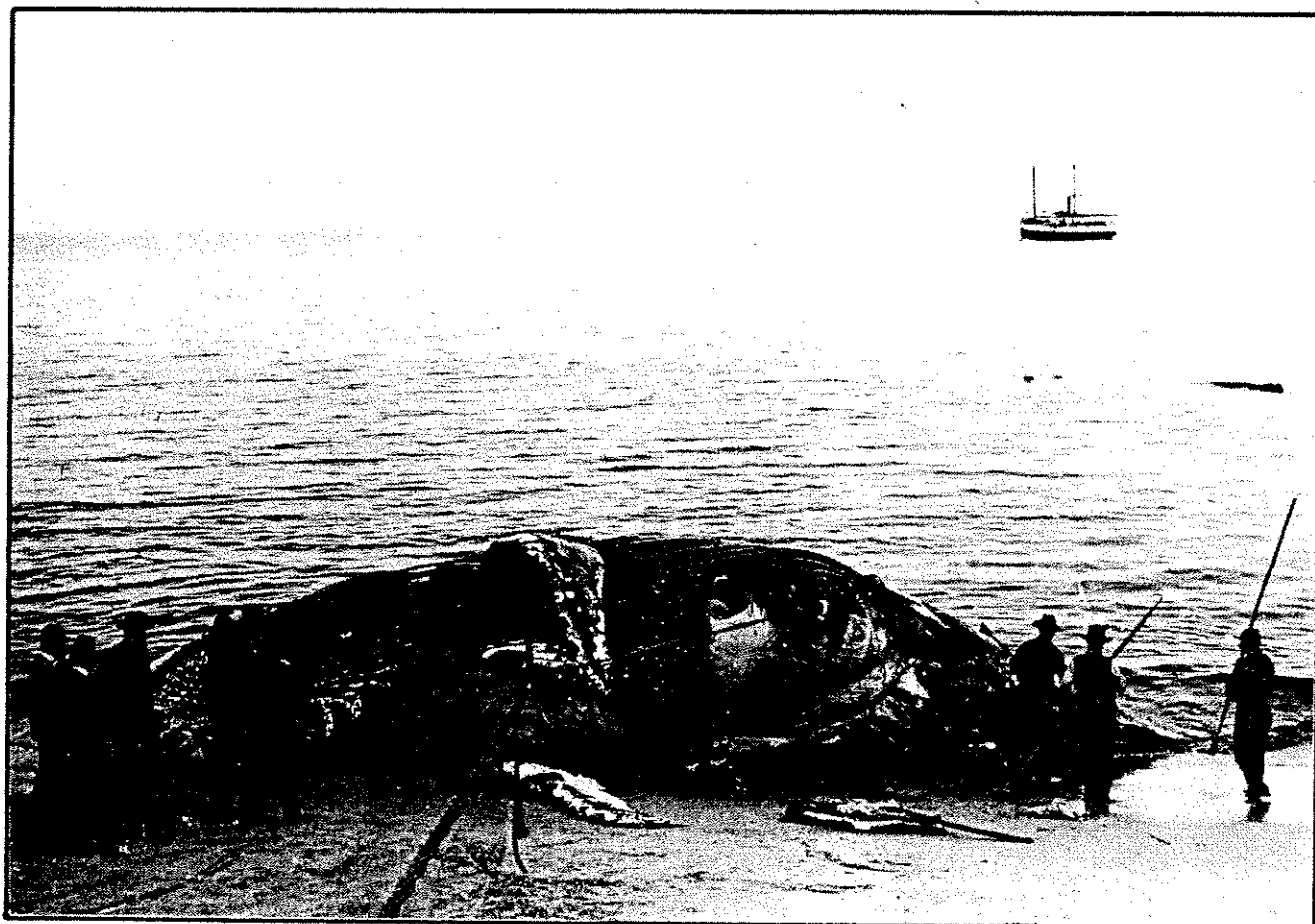
The thick organic layers in various places in the lawn area were undoubtedly waste by-products from either the fire holes or whale-fritters skimmed from the cauldrons. The tile platform east of the tryworks oven may have been a work area for coopers or perhaps a storage area. Weary workers discarded medicine containers, spent munition casings, broken clay pipes, and cast-off clothing items in the area north of the tile platform. A sleeping area or kitchen may have been nearby. Smaller quantities of pipes, buttons, and other items were scattered over twelve meters to the north of the tile platform out to the burned tile feature.

Few items from the 1880s were found in the portion of the site where the landform sloped toward the water line. In that area, however, crews found higher frequencies of hand-wrought bronze nails, most often used in ship and boat repair before 1890. The balance of the shore whaling station lies under the SAR building to the east of the excavation area. This is evident where the tile platform extends under the west wall foundation.

By the time the archaeological excavations close down, the lawn and parking lot areas will have been adequately sampled to address the questions in the research design. The only significant feature that will remain is the foundation of the tryworks oven in the middle of the lawn area.

Two concluding recommendations are offered for future consideration. First, if at all possible the tryworks oven ought to be preserved under the asphalt and leveling fill of the future parking lot of the new

SAR and club facility. It is the only known trywork oven on the Pacific Coast. Second, upon demolition of the current SAR building and its floor, a crew of archaeologists ought to swiftly excavate to the tiled floor level to trace out that feature and any others associated with it. Another test pit ought to be excavated inside the northwest corner of the SAR building to obtain a larger sample of the artifacts recovered in that area north of the tiled floor.



Hathaway photograph of Monterey whaling station in 1890.

The Tryworks Oven at Ballast Point

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Director of Archaeology
Fort Guijarros Museum Foundation

Archaeological exposure of the foundation of the Ballast Point tryworks oven in the fall of 1988 should rank as one of the most important archaeological discoveries in Pacific Coast maritime history. International interest in the find stimulated excitement at the Society for Historical Archaeology Annual Conference in Baltimore, Maryland in January of 1989. Future articles are planned to compare the dimensions and functional elements with similar ovens found in 16th century sites at Red Bay, Newfoundland.

Lacking the upper structure of the oven, the common brick and metal artifact rubble recovered atop the foundation and in the firepit suggest the structure to have been similar to tryworks ovens illustrated on the June 13, 1877 cover of Harper's Weekly Journal of Civilization (see cover). Similarities can also be drawn from tryworks ovens that operated on the decks of whaling ships.

Three examples of tryworks ovens and attendant equipment will be examined to interpret the Ballast Point feature. The 1877 Harper's

Weekly Journal of Civilization (here to fore Harper's Weekly) illustration provides a clear illustration of the relationship between the cutting-in of the whales and the ovens. Sketches in Joseph Phelan's The Whale Hunters in Pictures¹ synthesized all that is known of a typical oil boiling operation on the deck of a 19th century whaling ship. Phelan's artwork appears to have been based in part upon charcoal sketches rendered by Clifford W. Ashley² on a whaling voyage of the Sunbeam in the 1920s.

Attendant to all of these illustrations are the tools and equipment unique to the whale oil tryworks operation. Three rare glass plates of a Monterey Whaling Station cutting-in operation in 1890 will be analyzed to interpret the process of obtaining the whale blubber for transport to the tryworks area. The original plates have been restored by Pat Hathaway of New Monterey, California.³ (See photograph on Page 21.) The tools held by the men at Monterey and surrounding the tryworks illustrations were illustrated and described in detail by Charles M. Scammon in 1874 (Figure 1).

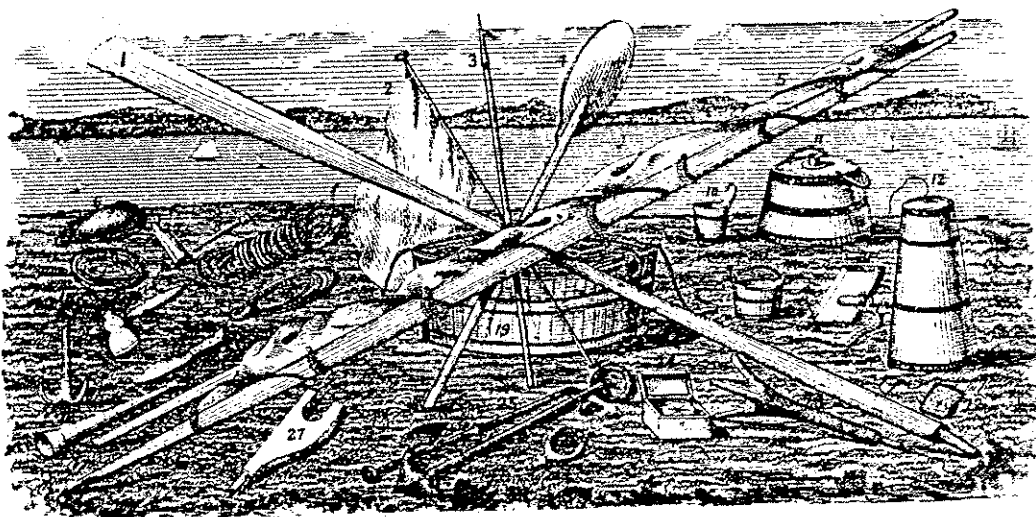


Figure 1. Tools illustrated by Charles W. Scammon in 1874.

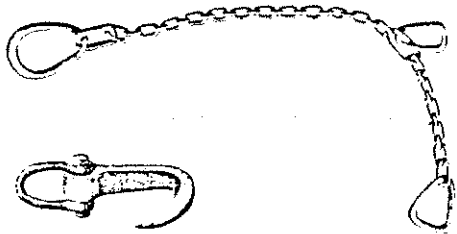


Figure 2. Blubber-hook and Fin-chain.

The dead whales were towed ashore at high tide and secured with chains and ropes with blubber-hooks and fin-chains (see Figure 2). On shore, a ship's capstan or windlass was secured among the rocks and men pushed poles to wind in the whales to shallow water. The Harper's Weekly illustration reveals two capstans for one whale. The Hathaway photos show both one and two capstans. Two or three men cut through the blubber with boarding knives and a variety of spades.

The Hathaway photos reveal the spades to have had long wooden handles. The edges were sharpened with portable files dashed to the belts of the cutting men. A hook was used to maneuver large vertical blubber strips during the cutting

procedure. The third Hathaway photo depicts a man in knee deep water pulling a hook that probably secured a chunk of blubber. The Harper's Weekly illustration shows two men hauling "horse blankets" or large strips of blubber on a stretcher toward the beach.

The tryworks operation comprised more than the oven. Separate work areas were organized to cut the horse blankets into sections. The blubber was then cut into thin slices of blubber attached by skin with double handled mincing knives. The resulting "Bible leaves" were caught in a tub. Clifford Ashley illustrated two men mincing Bible leaves atop a board over a wooden tub. A quicker method was to place the sections of the horse blankets in a "mincing machine" that automatically chopped the Bible leaves in one action. Two such machines were owned by the Packard brothers at Ballast Point in 1869.⁵

Small tubs of Bible leaves were then stacked on a staging area or porch in front of the tryworks ovens. Men would use long-handled hooks to deposit the blubber into the oven.

Clifford Ashley's charcoal sketch of the "Sunbeam's Try-works" and

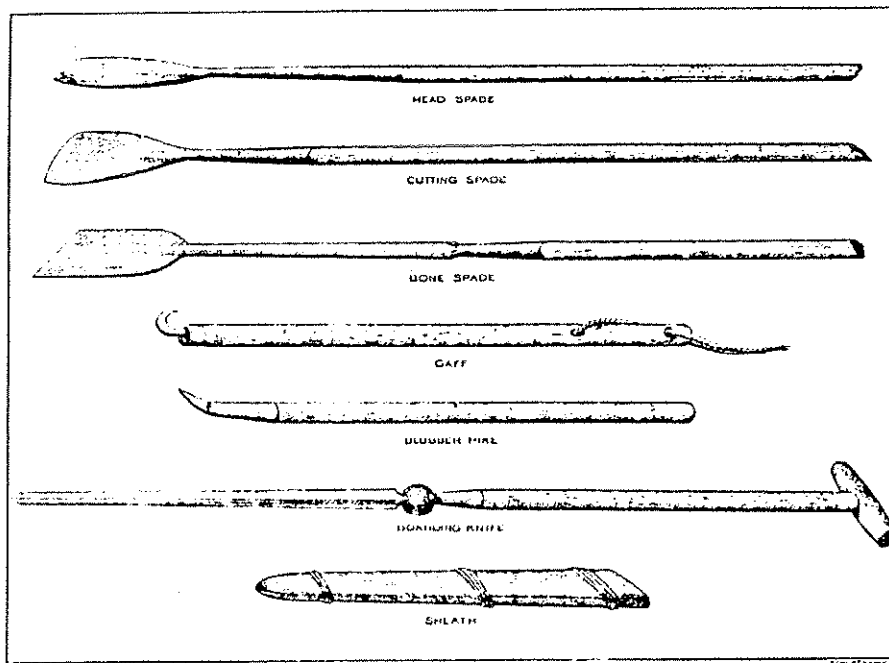


Figure 3. Implements used in cutting a whale.

Phelan's ship deck picture reveal the oven to have been a brick oven set around two large iron cauldrons. Rectangular metal doors hung over entrances to the furnaces or fire holes below the cauldrons. Ashley depicted the men standing on a wooden platform with the top of the oven at waist elevation. Iron bands bonded the top of the oven masonry together. Although unclear in the Harper's Weekly picture, two men appear working at waist level atop the uphill side of a very large tryworks oven that appears six or seven feet high on the downhill side.

Behind the men, opposite the furnace entrance is a masonry chimney that seems to measure another six feet above the top of the oven. The ship deck chimneys in Ashley's sketch seem to be about four or five feet high and made of riveted metal. Phelan's picture has similar chimneys that appear six to eight feet above the oven and protrude through a wooden roof ramada above the oven.

The roof would have protected the boiling oil and furnaces from rain and the seas.

Phelan's picture also depicts a man pouring a long handled ladle of hot liquid oil into a shallow metal trough or tray slightly back from the oven. At the Society for Historic Archaeology Annual Conference in Baltimore, Maryland, Lester Ross reported that 16th century Basque whalers ladled hot oil into similar trays to cool the oil so that it could later be poured into oak casks without fear of leakage. Another man in Phelan's picture is holding a long handled skimmer or sieve-like scoop full of fried out blubber or whale fritters. Edward Berwick (6) described an instance where the Monterey whalers in 1900 used whale fritters as an economical fuel for the tryworks furnaces.

The implications to be drawn from this analysis of the works of Ashley, Berwick, Phelan, Scammon, the Hathaway photos, and the Harper's

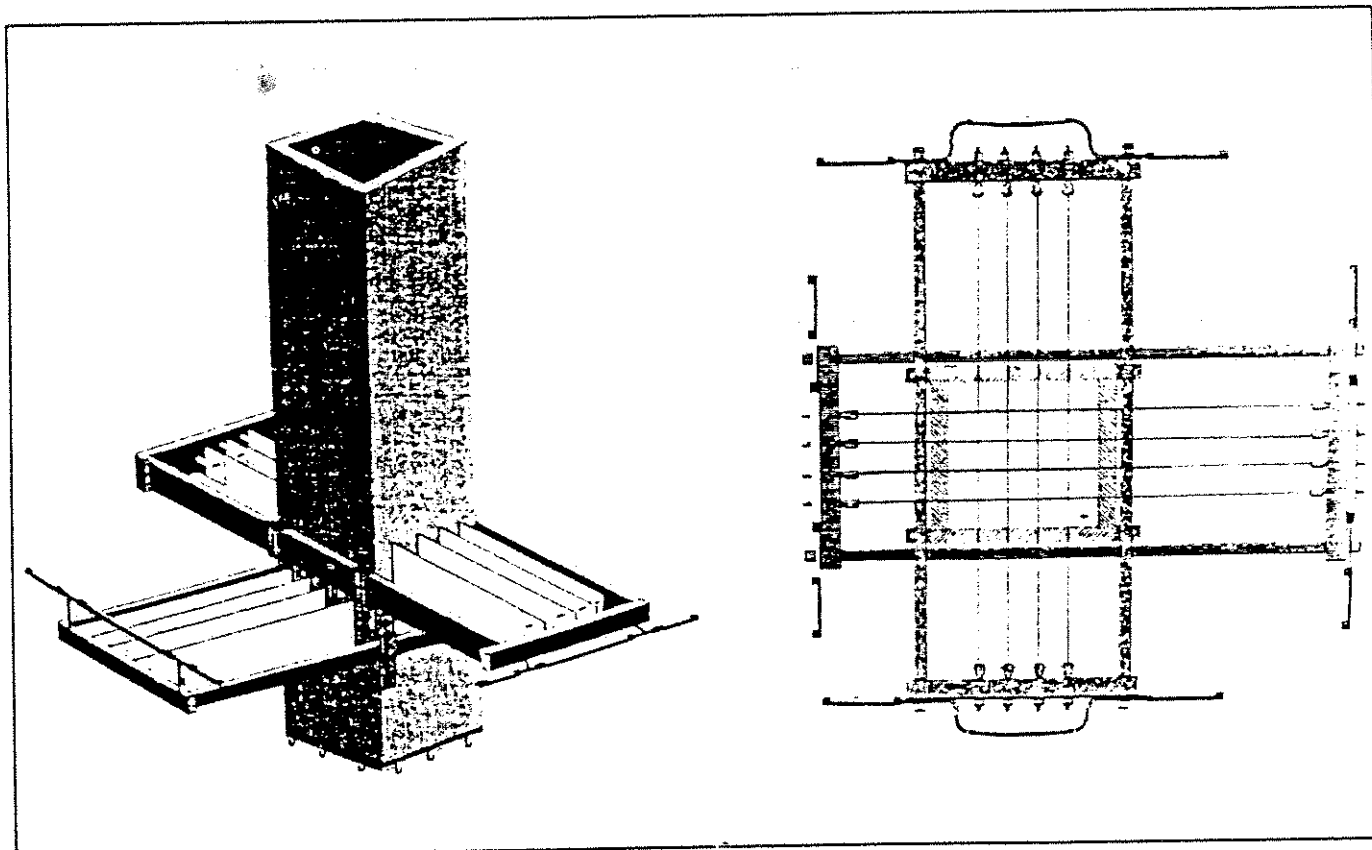


Figure 4. Apparatus for cutting blubber.

Weekly illustration are that the Ballast Point tryworks oven was probably a very large masonry structure that supported two large iron cauldrons, may have been covered by a ceiling, and had two metal or masonry chimneys. The size of the foundation discovered in 1988 is similar in scale to the two depicted in the Harper's Weekly, both of which appear larger than the ones illustrated on the ship's decks by Ashley and Phelan.

Perhaps one lesson to be gained from the Ballast Point tryworks is

that the shore stations might have constructed larger ovens than those on ships. Measuring four meters across the base and up to two meters high with a pair of four meter high chimneys, the tryworks at Ballast Point must have been impressive. Existing examples of whaler's cauldrons in California indicate the cauldrons would have each held a capacity of either 150 or 300 gallons each.

Atop the open cauldrons and below the top of the chimneys, ceilings of wood or canvas would have been

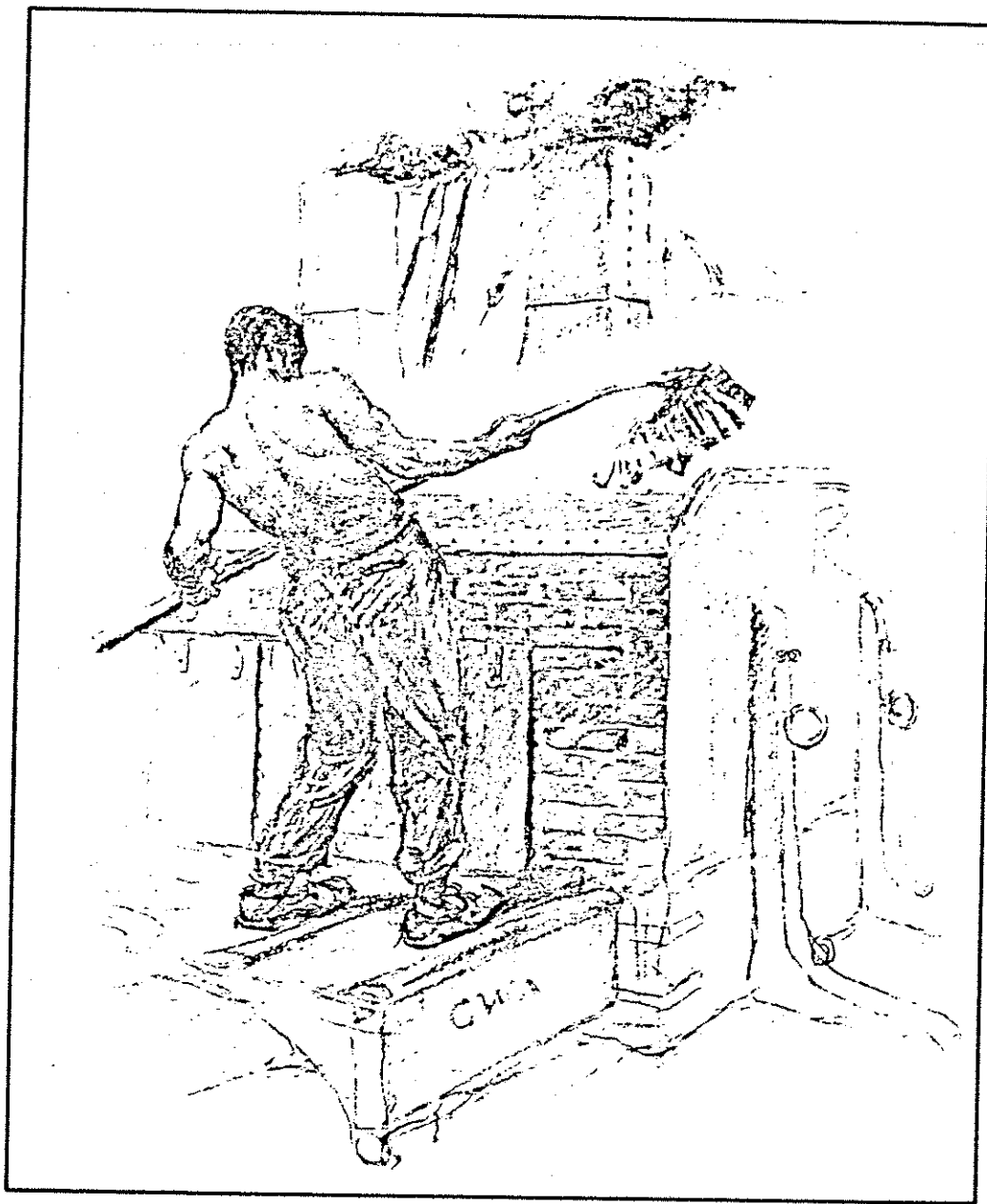


Figure 5. Boiling: The Sunbeam's Try-works.

erected to shield rain and sea spray from the volatile oil. Cooling trays or troughs, a coopering workshop, a blacksmithy, storage areas, quarters for resting and tack areas for whaling equipment would have surrounded the tryworks oven. Ropes, loose tools, and a wide variety of personal objects would have made the Ballast Point Whaling Station a very busy area when the whales ran between October and May in the 19th century.

END NOTES

1. Joseph Phelan, The Whale Hunters in Pictures. New York: Time-Life Books. 1969.

2. Clifford W. Ashley, The Yankee Whaler. New York: Halcyon Press. 1926.

3. Pat Hathaway, Historical Photograph Company, The Pat Hathaway Collection of California Views, 763 Lighthouse Avenue, New Monterey, California.

4. Charles M. Scammon, The Marine Mammals of the North-western Coast of North America, Described and Illustrated Together with an Account of the American Whale Fishery. New York: G.P. Putnam and Sons. 1874.

5. Sheriff James McCoy, District Court Case #387, Research Archives, San Diego Historical Society.

6. Edward Berwick, "Offshore Whaling in the Bay of Monterey," The Cosmopolitan, 24 (May 1900) 633-636.

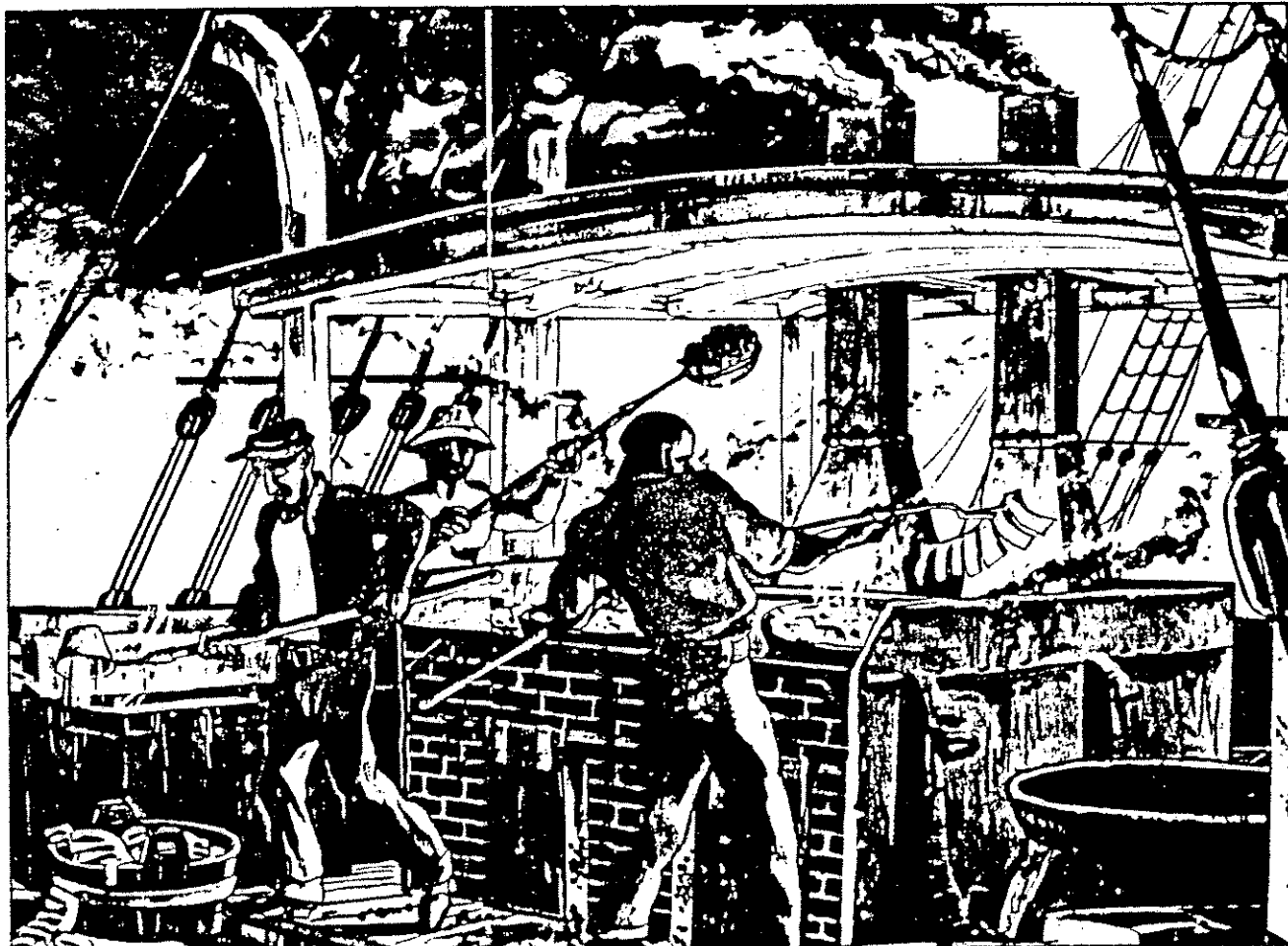


Figure 6. Sketch from Joseph Phelan's The Whale Hunters in Pictures.