

THE ARCHAEOLOGY OF THE STEAM SHIP *POMONA*: 1998 UNDERWATER SURVEY

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ABSTRACT

In August 1998, California Department of Parks and Recreation and Indiana University conducted a joint survey of the wreck of the *S.S. Pomona*. The purpose of the survey was to map the wreck, assess its extent, and identify key features. This paper describes the methods used to conduct the survey and their results. The ship's hull and machinery were located and mapped, and some artifacts were recovered. Analysis of the findings are contributing to the history of maritime commerce along the west coast and increasing our understanding of the role of steam ships in California.

INTRODUCTION

In 1998 a survey was conducted to assess the integrity and importance of the *S.S. Pomona* in maritime history. As a result of this survey, the ship's complete contour was mapped, including hull, bow, boilers, drive shaft and rudder. From library research, it was identified that the *S.S. Pomona* sank on her starboard side. The debris field corroborated these accounts. Numerous structural remains were identified that help tell the vessel's story. These include bollards, masts, scuppers, etc. This research is producing important new information on steam ship construction at the end of the 19th century.

HISTORICAL BACKGROUND

S.S. Pomona was the first steel-hulled coastal liner built for the Pacific Ocean. Built in San Francisco by the Union Iron Works in 1888, under the architectural supervision of Irving M. Scott, Jr., the ship was launched with three decks, two masts, a plain head, a round stern, and a steel hull. The vessel carried two anchors and chains, four metallic lifeboats, and four life rafts. Passengers' cabins had steam heat and an electric lighting system. Although *S.S. Pomona* had a registered cargo capacity of 900 tons she could carry nearly

1200 tons of freight (Lloyds 1888-1909; National Archives 1876-1890, 1882-1991).

Powered by a steam-driven, triple-expansion engine of 1250 horsepower, she could achieve a maximum speed of 15.5 knots (San Francisco Maritime Museum, John Scott Plans Inventory). The steam was generated by coal combustion in two circular Scotch boilers, with brick-lined furnaces for heat refraction. This drove the single propeller, 10.6 feet in diameter, with a 16-foot pitch (Osbourne 1941; San Francisco Maritime Museum, W. W. Hanscom Accession; Sheret 1997; Union Iron Works 1916; Wallace 1983). In addition to the three-cylinder engine, the steam powered several auxiliary donkey engines and the dynamo. The *Pomona* carried a set of sails as backup propulsion. To support the sails, the vessel was equipped with two iron masts, bowsprit, and main yards, and secured with steel standing rigging.

The *S.S. Pomona* left San Francisco on March 17, 1908 for her last trip. Two miles south of Fort Ross, the ship hit a rock that dug a hole in its hull. Captain Swansen decided to make a run for Fort Ross and beach the *Pomona* as she was quickly taking in water. Unfortunately, while coming into the cove, Swansen pinned the *Pomona* on a submerged rock in the middle of the cove. Broken

in half, the *Pomona* was rapidly sinking. Although the ship was a total loss, there was no loss of lives or injuries. A few days later Captain Thomas P. Whitelaw was commissioned to salvage the cargo and to attempt to lift the vessel off the bottom. All attempts failed since the bow was broken.

A year after the sinking, *S.S. Pomona* was declared a menace to navigation and was twice dynamited. Sport divers discovered the ship again in the 1950s. During the next three decades they recovered numerous artifacts, losing their provenience from the site.

California State Parks and Recreation archaeologists led the first official survey in 1984 (Foster 1984). This phase of research recognized the importance of the *S.S. Pomona* as an historical vessel and established the basis for additional survey efforts.

OBJECTIVES

Various factors have affected the integrity of the site since 1908. Consequently, the research goals were: (1) to provide protection to the shipwreck by nomination to the National Register of Historical Places; (2) determine the extent of the site; and (3) assess its potential for additional research. This site is eligible for inclusion on the National Register of Historic Places because of the role the *S. S. Pomona* played in California maritime history. The *S.S. Pomona* is associated with events that made a significant contribution to the broad patterns of history, such as the expansion of trade and migration on the west coast. She is associated with persons (J. T. Scott, marine architect) and entities (Pacific Coast Steamship Company) that made significant contributions to the maritime history of California. The *S.S. Pomona* also represents an early example of the then new technology of triple-expansion, steel-hulled vessels. A perfect example of such a steam engine ship, hers was the first triple-expansion engine built on the west coast. The *S.S. Pomona* was also the first steel-hulled coastal liner built on the west coast. Finally, the vessel has provided, and is likely to continue to provide, important archaeological data on this type of vessel since her original plans have been lost.

ENVIRONMENT

Geography

Today the remains of the *S.S. Pomona* lie approximately 90 miles north of San Francisco in Fort Ross Cove, California. Oriented north-south, the ship is submerged under 17 to 40 feet of water. When the *S.S. Pomona* hit a partially submerged rock, the stern sank first. The ship listed to starboard, where it now rests. The bow was pinned on the rock for almost a year until the first winter storms washed it into deeper water. Today the stern points towards shore, at a 33-degree angle from magnetic north. The stern is in approximately 17 feet of water at mean tide, while the bow, facing the open seas, lies at a depth of 40 feet. The drive shaft is intact, as are the rudder and boilers. One boiler lies northwest of the rudder, a result of previous dynamiting. The main section of the hull and ribs are in their original location, their starboard side resting against large boulders.

Condition

Overall, the main features of the *S.S. Pomona* are easily identifiable, once one learns to distinguish marine growth from artifacts. The steel hull and machinery are well preserved and have remained stable since their sinking. Almost fifty percent of the vessel remains intact despite prior salvage operations.

Site Description

Fort Ross Cove deflects most westerly swells, protecting the *S.S. Pomona* from further mechanical damage. The bottom is gently sloping towards the open ocean in the outer bay. Toward the west, the bottom is deeper and in the late 19th century served as an anchorage for ships loading lumber and goods. To the north, approaching the shore, the bottom becomes too shallow to dive except when there are no swells. The submerged rock, on which the *S.S. Pomona* foundered, is in the center of the cove, visible at low tide and during periods of heavy swells when waves break at its highest point. There is a deep groove in the washrock ground out by the *S.S. Pomona's* hull during the 8 months she hung there in 1908. The underwater terrain is composed of boulders, with a thick cover of marine life. Bull kelp (*Nereocystis leutkeana*) is visible from the surface and grows

thick during the summer months. It is later ripped to shore by the first heavy winter storms. This boulder-strewn terrain encloses objects that fall within it. Consequently the *S.S. Pomona* has not moved much. She lies in water deep enough to be mostly unaffected by storms and far enough from the beach that she is not affected by most erosional processes.

Material

The surface of the steel artifacts is encrusted with coralline algae (bryozoan) and supports heavy kelp growth. Brass items, such as pipefitting or copper tubing, have developed a green patina which inhibits marine growth. Most thin sheets of steel, such as those supporting the hull, or lining the outside of the boilers, have rusted through and crumble to the touch.

SURVEY METHODS

In August 1998, the author, together with a team of faculty and students from the program of Maritime Science at Indiana University and staff from the California Department of Parks and Recreation, conducted a one-week diving survey of the *S.S. Pomona*. This research involved collecting and interpreting previous documentation, recording the underwater site, preparing maps, and presenting the results to the Fort Ross staff.

Field directors John W. Foster and Charles D. Beeker used a hand-held global positional unit (GPS) to relocate the site, using coordinates from the 1994 survey. Once the drive shaft was identified, using prior maps (Hunter and Fisher 1989), a buoy was attached to its southern end and numbered B1. Subsequent buoys were installed along the shaft, in increasing numbers, with B4 at its northern end above the rudder. Buoys B2 and B3 were placed on the bearings of the drive shaft. A tape measure was attached along the length of the drive shaft and this formed the baseline for all mapping.

A grid system, typically used in archaeological surveys, could not be used here due to the heavy surge. Instead, the divers mapped features and artifacts from the small baseline and extended the baseline as work progressed. During the first

stage of the survey, the area around the drive shaft was mapped and measured by one team, while a second team established the extent of the scatter around this area by swimming regular incremental patterns away from the baseline. Each artifact was recorded and located with respect to the baseline. The port side to the baseline contained a large assemblage of masts and steam pipes. On the starboard side, numerous artifacts were recorded, including a complete ceramic plate, a brass valve fitting, a steel flywheel, and a steel vent. The rudder and numerous single and double bollards (a vertical post used to secure lines) were scattered north of the baseline. Finally, one boiler was found lying about twenty yards north of the rudder. In 1909 the *S.S. Pomona* was deemed a menace to navigation and its remains were dynamited. This explains the location of the boiler. While mapping the coordinates and size of the boiler, divers discovered bricks lining its furnace floor. Two bricks were brought to the surface and photographed. These were impressed with the word "Carnegie," the name of a brick manufacturer from Hollister, California.

Next, divers moved forward towards the bow and extended the original baseline. Divers working in teams of three explored the port side of the wreck. One team mapped the exposed hull area, which still contained intact iron ribs. Another team mapped the engine area, starting with the three connecting rods (from the crankshaft to the pistons.) Two pistons were located. The missing piston may have been salvaged by T. P. Whitelaw in 1908, or has not been located yet by divers. Two boilers were located and mapped. We could see the boilers' tubes used to conduct steam from the inside, as well as the fire box and ash window. There was little scattered debris on the port side, such as steel plates and pipes, although remnants of a pillaged porthole were mapped. Artifacts located and mapped include structural elements such as a probable scupper, and personal elements such as a ceramic bowl and a leather shoe. Further west, extensive structural wreckage included mast fittings, ribs, pipes, and wire running rigging.

The last phase of the survey focused on the bow area. The bow is located seaward from the washrock, and faces south. The original baseline was extended so that it measured 190 feet in its

entirety. Although the ship itself was 220 feet long, the breakage may have destroyed some of the hull. The hull of the bow is wedged between rocks and consequently there is little debris to the port. Most artifacts fell starboard and divers mapped porthole remnants, single and double bollards, capstan, bowsprits, and hawsers. There is an extensive scatter of steel plates and pipes.

Finally, experienced divers videotaped the length of the *S.S. Pomona* and photographed artifacts and features.

FINDINGS

Few easily portable artifacts remain today because of previous salvaging attempts. In 1908, the contracted salvaging company, Thomas. P. Whitelaw, recovered winches, ropes, windlasses, anchors and chains, steering gear, boats, davits, ventilators and compasses, blocks, and sundry mattresses and sheets. These items were sold at auction on San Francisco's Broadway Wharf in 1908 for a total of \$3000. Both wooden planks bearing the name of the *S.S. Pomona* were removed in 1908.

Sport divers told us that they had recovered easily portable, structural elements (*Marine Digest* 1971: 20, 35; McKenzie n.d.; Oller 1971; Walton 1998). Some of the artifacts recovered include several portholes, a 30-foot section of anchor chain, a brass steam gauge, a steam whistle, two turn buckles, a drain cover, a fire valve, a pin, a wooden pulley, and personal artifacts such as a ceramic dish and a pocket knife. In 1974, sport divers donated a single porthole to the Fort Ross museum.

Artifacts recovered during the 1998 survey include a leather shoe, a brass coat hook, a ceramic plate, a valve fitting, the two bricks from the boilers, and some coal used for fuel. Small brass and copper objects (such as pipes and fittings) were also recovered to prevent further looting. All artifacts recovered in 1998 are located at the Fort Ross library awaiting conservation.

CONCLUSION

The result of this survey was a detailed site map, which documents the wreck's current condition and will facilitate further work. From this project, we discovered that the ship was more intact than was previously thought. For example, newspaper articles reported that all the engines of the *S.S. Pomona* were salvaged in 1908 (*San Francisco Chronicle* 18 March 1908: 1/3, 2/3; 29 March 1908: 38/3; Wallace 1983), and this proved to be erroneous, since we located most of the engines, pistons, and rods. We were also surprised to find numerous smaller artifacts, when we believed that the effect of time and the rough seas, in addition to previous looting would have depleted the *S.S. Pomona* of most non-structural artifacts. Finally, the presence of three boilers on the ship led us to re-interpret the architectural modification plans (San Francisco National Maritime Museum, John Scott Accession) and we concluded that the third boiler was a donkey engine, which could have been used to generate electricity on the ship.

This survey was an initial attempt to locate the wreck and assess its condition and spread. With an acreage estimate, gathered from the spread of the wreckage, the author will prepare a nomination of the *S.S. Pomona* to the National Register of Historic Places. Another survey will take place in 1999, led by the same team directors, to conclude the mapping effort. This subsequent survey will be used to evaluate the potential of the *S.S. Pomona* as an underwater park.

NOTES

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Figure 1. S.S. Pomona

