

FINDINGS: (+)
Clatsop County
Sec. 19; T4N, R10W, W.M.
U.S.G.S. Quad: Arch Cape, OR, 7.5', 1970
Total Project Ac: 0.25 mile
Approx. Total Ac. Surveyed: 0.25 mile
Project Type: Shipwreck Cannon Recovery
Field Notes Location: OR SHPO
Arch. Permit # 1089

Recovery of Arch Cape Cannon:
Report to the Oregon Parks and Recreation Department and
the Department of State Lands
Regarding the Discovery of Two Cannon at Arch Cape

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Project Description

Two cannon were discovered on State land off the coast of Oregon near Arch Cape in Clatsop County in mid February, 2008. Afraid that the cannon might be stolen or suffer from future storm damage (e.g., uncovered by tide and left to deteriorate through exposure to the elements), State Parks' personnel hauled one of the cannon partially up the beach on February 18th so that both cannon could be easily retrieved the following day. State law (ORS 390.235) dictates that a state archaeological permit is needed to remove any artifacts from an archaeological site on public lands in Oregon. The Oregon State Historic Preservation Office was contacted and asked to assist in the recovery efforts since public attention had attracted many people to the beach and OPRD staff was afraid that the cannon or associated debris from an earlier shipwreck may disappear before or during the recovery efforts.

State Archaeologist, Dennis Griffin, joined Nehalem Bay State Park staff on the afternoon of February 19th and assisted with the recovery of the two cannon. The recovery efforts were conducted under state Archaeological Permit AP-1089. This report summarizes the recovery efforts and provides recommendations for long-term conservation and exhibition of the recovered cannon.

Location

The two cannon were located in Township 4 North, Range 10 West, Section 19, approximately 200 feet below mean high tide off the beach at Arch Cape, Oregon (Figure 1). Recent severe storms along the coast have resulted in the depletion of beach sands eroding at least 11 feet of sand from the normal sandy beach at Arch Cape. During a period of low tide (i.e., -0.8 feet asl), the two cannon were exposed on the clay floor of the ocean, surrounded by driftwood and a large stump. The latitude and longitude for the two cannon are: Canon 1 – N45^o 49.286', W 123^o 57.787"; Cannon 2 – N45^o 49.298', W 123^o 57.797'.

Environmental Background

The unincorporated town of Arch Cape is located along the Pacific Ocean on both sides of Highway 101, south of the current town of Cannon Beach. Arch Cape consists of a small community of houses located along the ocean between Arch Cape and Hug Point. The portion of the beach where the cannon were recovered is located approximately ¼ mile south of Hug Point. Houses in the vicinity of the discovery are set back from the rocky beach by approximately 25 meters (78 feet). The gravel beach is comprised of 2-5 cm diameter pieces of gravel, which slopes toward the water at about 10^o. The gravel beach extends for about 15 meters before dropping off steeply. The sand below the gravel beach has recently been eroded to a depth over 11 feet. The cannon were found approximately 20 meters from the drop off. See Photograph 1 for the location of Cannon 1 before it was hauled further up the beach on February 18th.



Photo 1: Arch Cape beach, looking north, with Cannon 1 in foreground by tide line. Hug Point in background

In the Arch Cape area, the general coastline consists of steep headlands, sea stacks (small offshore islands) and long narrow beaches. Steep sided headlands, such as Arch Cape to the south and Tillamook Head to the north, consist of well-cemented sandstone separated by coves that have been eroded in softer sandstone by the waves and winter storms (English and English 1993:45). Being that the cannon were found beneath the ocean there is no vegetation worth noting in the surrounding area that relate to the discovery.

The Oregon coast often has winter storms with strong waves that pull sand from the shoreline and carry it into deeper waters to the north. Summer is when this process is reversed with currents and winds from the north bringing in water from the deep and replacing the sand that it removed earlier (Ross 2008:A7). In recent years, the forces that replenish the sand on Oregon's beaches have not been doing their part to make up for the winter sand depletions. Coastal geomorphologist Jonathan Allen, from the Oregon Department of Geology and Mineral Industries, doesn't know what has caused this change in storm and wave patterns along Oregon's coast but has heard many arguments attempting to link it to climate variability and human impacts (Ross 2008:A7). The true reason for the change remains unknown at present but it is not a sudden change affecting the coast during just this winter. It is a process that has been occurring for over the last ten years. Beach sands have not been replenishing and storms continue to gnaw away at the shoreline. If this trend continues evidence of more shipwrecks can be expected.

Historical background

The coast of Oregon, especially the mouth of the Columbia River, has proven to be extremely treacherous to ships that sailed the Pacific Ocean. The mouth of the Columbia, nicknamed the “Graveyard of the Pacific”, is said to be a ship graveyard due to the ever-shifting sandbars and the number of ships that it has claimed. In trying to identify the ship associated with the two recently discovered cannon, the Oregon SHPO shipwreck database was reviewed and 173 wrecks were noted having occurred along Oregon’s northwest coastline or the mouth of the Columbia where ship debris could have washed ashore along the Arch Cape area. From this list, a closer examination was made of the ships that might have once sported cannon and the list was reduced to 104 ships (see Appendix A). Details on most of these ships are not readily available so it is not possible to note which ships actually had large iron cannon similar to the ones recently identified. Once x-rays of the cannon can be conducted and a more accurate description of the shape of the discovered cannon can be ascertained, a more detailed review of possible associated shipwrecks will be made. Basic cannon shape changed over time (both in form and size) so that the outline of the cannon determined from x-rays should provide a relative tie indicator that will limit the possibilities of related ships.

The most frequently mentioned ship thought to be associated with the cannon is the U.S.S. Shark. Portions of the U.S.S. Shark are known to have washed up on the Arch Cape beach following its 1846 wreck and a cannon from the ship was recovered from the beach in 1898. More detailed information regarding the U.S.S. Shark is included below

USS Shark

The Schooner U.S.S. Shark, was built at the Washington D.C. Navy shipyard and launched on May 17, 1821. She weighed 198 tons, was 86 feet long with a 67 foot 4 inch keel and a 24 foot 9 inch molded beam, and carried twelve guns, ten cannonades firing 18-pound shot and two “Long-Tom” guns firing 9-pound shot (Dennon 1988:2, 5). U.S.S. Shark crewmember Burr Osborn has stated that the Shark was a 300-ton schooner with 32-pounder cannons (Himes 1913:361) but this account was taken from memory 67 years after the accident and is believed incorrect (see Dennon 1988:5). The U.S.S. Shark was one of four small William Doughty designed Baltimore Clipper schooners commissioned by the Navy to suppress piracy in the West Indies (Anonymous 1989:3) and the last to survive. The Shark spent 18 years operating in the Atlantic suppressing piracy in the West Indies and the slave trade off the coast of Africa. In 1839 she was reassigned to the Pacific Ocean and became the first U.S. war ship to pass east to west through the Strait of Magellan (Dennon 1988:2).

On April 1, 1846 Lt. Neil M. Howison commanded the U.S.S. Shark and he received orders to proceed to Honolulu for repairs, where he was to procure two whale boats and provisions before sailing to the Columbia River where he was to survey conditions in the Oregon Territory relating to the Canadian border negotiations that were then in progress. Lt. Howison was to accomplish this survey in time to leave the Columbia River by September 1st and return to San Francisco to report.

The Shark, newly repaired and coppered, left Honolulu on June 23, 1846 arriving at Fort George (Astoria) on July 19, 1846. The Shark was temporarily grounded on Chinook Spit on July 15, 1846 while attempting to enter the Columbia River. Navigation charts of the sandbars along this stretch of the Columbia were known to be problematic with pilots having to rely on charts made by Lt. Wilkes in 1841 (Dennon 1988:10) or trust in experienced pilots who were more aware of the shifting sandbars in the area. Unbeknownst to the crew of the Shark, the Canadian border dispute had been settled in Washington D.C. on June 15, 1848 before they departed from Honolulu. This news did not reach Oregon until November (Dennon 1988:7).

The survey proceeded as ordered. The Shark was late in returning to mouth of the Columbia River after stopping to assist another vessel that was in distress. While attempting to cross the bar on September 10, 1846, the Shark was wrecked on the south spit. Miraculously, no lives were lost. Part of the wreckage with three cannonades attached later was discovered having come ashore south of Hug Point. Midshipman Simes of the Shark was sent to the location and reported that “the deck between the mainmast (second from the bow) and fore hatch, with an equal length of the starboard broadside planking above the wales, had been stranded, and that three cannonades adhered to this portion of the wreck” (Dennon 1988:21). Figure 2 depicts the portion of the ship that is reported to have washed up on the Arch Cape beach. Simes managed to remove one of the cannon and moved it above the high-water mark but the other two cannon were inaccessible on account of the high surf.

Regarding the initial wreck site near the mouth of the Columbia River Lieutenant Howison (1848:6) writes “Within a month all the upper works, decks, sides and spars came ashore from the wreck, but separated a distance of 75 miles from each other, and were of no value, from the long wash and chafing which they had undergone.” After the portions of the Shark came ashore in the Arch Cape area, people of Clatsop came to the beach and cut up the wood burning the pieces for the copper bolts the vessel was fastened with. The iron retrieved from the wreck was pulled out of the salt water and placed above the high tide. Iron from the knees that held the deck fast to her beams was collected and reused. The remaining iron was piled up on the side of the bank of a small creek, which empties into the ocean by the side of a large hemlock tree (Vaughn 2004:51). Local residents are reported to have packed much of the iron out on horseback and reused it in local boat construction and utilitarian projects. Warren N. Vaughn (2004:49) noted that two guns had been seen along the Arch Cape beach; these being a nine-pound iron gun and the other a brass six-pounder. These guns were covered in sand and after having both been seen many times they disappeared under the beach sand. The Shark was suppose to have on board two nine-pounder guns but there is no record of the USS Shark having a six-pounder cannon. It is not known if these cannon originated from the Shark or another ship that may have washed up on the beach at some time in the past. If from the Shark, these cannon may still lie buried near the mouth of one of the area streams (i.e., Shark or Austin Creek).

UNITED STATES SCHOONER "SHARK"

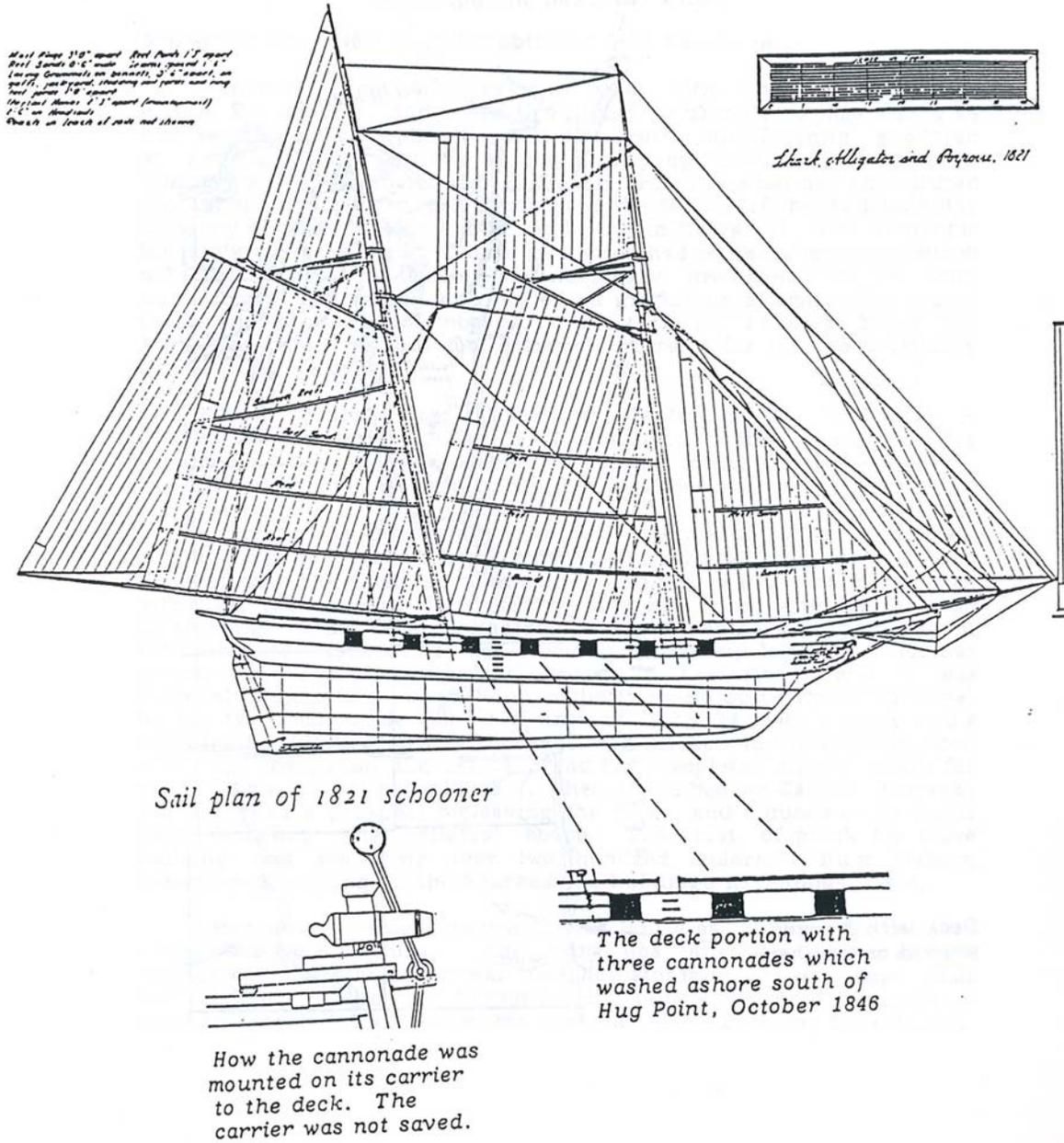


Figure 2: United States Schooner "Shark"
(from Dennon 1988:20)

In 1891, James P. Austin moved to the spot where the cannon was suppose to have been left by Midshipman Simes, and he established a post office there named "Cannon Beach." Austin died in 1894 without ever finding the cannon. A storm in January 1898 revealed a cannon on the beach in front of the town's post office. Mailman George Luce of Nehalem discovered the cannon out on the sand along with the ship's capstan. See Figure 3 for the location of the original 1891 Cannon Beach post office in relation to the current cannon discovery. John and Mary Gerritse are reported to have brought their team of horses from Nehalem and hauled the cannon off the beach (Dennon 1988:33). The cannon remained privately owned until 1956 when it was donated to the public by Mel Goodin and it was moved to the highway on an acre of land donated by George Van Vleet (Dennon 1988:2). In April 1989 the cannon was moved to the Heritage Museum in Astoria in order to provide a more protective environment from weathering and vandalism There the cannon remained until it was transferred to the Cannon Beach Historical Society where it now resides. Until relatively recently the cannon and capstan were kept outside where they continued to be adversely affected by weather. The Cannon Beach Historical Society has recently built an enclosure for both artifacts, which will greatly benefit their long-term preservation.

Pinpointing the actual site where the 1898 cannon was found remains somewhat confusing. Most accounts state that Mail carrier Bill Luce saw the cannon in the creek on Cannon Beach in front of Mrs. Austin's house (The Daily Astorian 1-29-1898 in English and English 1993::20). Earlier accounts of seeing cannon near the mouth of a creek had been reported in 1863 by John Hobson (Dennon 1988:29) and Vaughn (2004:49) that is believed to have been later named Shark Creek. The site of the Austin House is reported to have been in an area now called Cannon View Park, commonly referred to as the "flats" (English and English 1993:19). It was the site of the first Cannon Beach Post Office, which was established in 1891 and closed in 1901. The recently discovered cannon are located less than 200 feet south of the historic post office location. If the original cannon found in 1898 was indeed found near the site of the old post office it is difficult to believe that three cannon could be found within a few hundred feet of each other and them not being from the same ship. Particularly given that the Shark was noted as having three cannon wash up on the beach attached to the ship deck.

The historic post office location (as marked today) is located approximately ½ mile north of Shark Creek and 1/6 mile north of Austin Creek (see Figure 1 for location Austin homestead in relation to Shark Creek). It is unclear if the Austin house and post office were in reality two separate structures on a single homestead claim, but not in close proximity to each other, or if a small creek once existed in the area of the historic post office that has since been diverted by residential development. The 1893 GLO map (Figure 4) plots the location of Austin Creek near the location of the recently discovered cannon, however current USGS maps shows Austin Creek further to the south. GLO maps are notorious for being inaccurate but one must wonder if stream channel modifications have occurred along Austin Creek during highway construction efforts and could the 1898 discovered cannon have been found near Austin Creek rather than Shark Creek? Fresh water was seen seeping from the gravel beach in the vicinity of the recent cannon discovery, which could be from a drainage east of Highway 101 that was more

pronounced during periods in the past. Could this “creek” have been the one noted in the historical accounts relating to the discovery of cannon earlier in the area? Further consultation with area residents and ODOT construction crews are needed to answer some of these questions and will take place while the restoration of the cannon is being completed.

As noted above, the historic post office of Cannon Beach, located at the present day Arch Cape, was closed in 1901. The present day Cannon Beach was earlier called Elk Creek and Ecola (Dennon 1988:2) but had requested a name change to Cannon Beach in 1922. The name change was not looked upon favorably by all local residents since the older name, Ecola, commemorated the spot where Lewis and Clark were said to have camped on the bank of the Ecola Creek during the winter of 1805-06 (Morning Astorian 1922:3). In spite of attempts to reverse the name change decision, the present day Cannon Beach retained the name and celebrates that discovery of the cannon from the USS Shark. The cannon discovered in 1898 was eventually given to the Cannon Beach Historical Society and it is now displayed at their office in Cannon Beach, along with the metal capstan (see Photos 2 and 3). Two replicas of the 1898 cannon were cast in 1952 and are displayed at the north and south entrances to the current city of Cannon Beach (Photograph 4). A third replica was later cast and is on display in the community of Arch Cape (Photograph 5).

The Maritime Museum in Astoria now houses a portion of a rock carved by the Shark’s crew soon after the wreck of their vessel, in addition to a sword that is believed to have belonged to a Shark officer.

Project Background and Field Methodology

Two cannon were discovered off the coast of Arch Cape, Oregon during the President’s Day holiday weekend of February 16-18th. A father and daughter from Tualatin, Mike and Miranda Petrone, discovered the first cannon on Saturday evening (February 16th) while walking along the beach. Once they noticed the shape of a cannon they contacted representatives from the Cannon Beach Historical Society who in turn contacted the mayor who came out to the beach to confirm the discovery (Rollins and Crombie 2008:A4). The cannon were only visible during low tide, which occurred, in the late afternoon. Word of the cannon discovery quickly spread and interest among the local population grew quite high. A cannon was discovered on this same beach in 1898 and this recent discovery was thought to be of a cannon from the same wreck, the USS Shark that had wrecked on a sandbar near the mouth of the Columbia River in 1846.

By Monday the Arch Cape beach had attracted many people who awaited low tide to look for the cannon. State Park personnel became worried that the cannon or other associated artifacts would disappear during the period of low tide with many people wanting to obtain a piece of Oregon’s past. Knowing that state law protects significant historic artifacts on public lands in the state, and that metal and wood artifacts recovered from the sea quickly deteriorate if not treated properly, State Park employees sought to keep all discovered artifacts together until they could contact the State Historic Preservation Office (SHPO) as to how to handle the cannon discovery. While considering

what steps needed to be taken to insure all artifacts remained at the site, a second cannon was located further up the beach from the first by Tualatin resident Sharisse Repp. OPRD supervisor Gary McDaniel confirmed that this find was indeed a second cannon and realized that this discovery would greatly increase the interest of the public to the Arch Cape beach. Concern for public safety and fear that that the first discovered cannon may not be retrievable due to its location from the beach (i.e., the extremely low tide that was occurring at the time of the discovery, and the knowledge that a storm was approaching later in the week), efforts were made to haul the cannon further up the beach to an area near the second cannon so that retrieval efforts could more easily be conducted the following day. A chain was fastened around the cannon and hauled up the beach by a small John Deere tractor (see Photograph 6). State park personnel remained on-site throughout the night to ensure that the cannon were not removed illegally. Local residents, armed with video cameras, documented the movement of the cannon up the beach and film footage was soon available on the world-wide web.



Photo 6: Initial hauling of Cannon 1 further up the beach

Salem State Parks Headquarters and the SHPO office were contacted early Tuesday morning and asked to assist in the recovery efforts for the cannon. State Archaeologist Dennis Griffin agreed to apply for a state archaeological permit and to be on hand later that day to assist in their recovery. Expedited Archaeological Permit 1089 was sent out for review and completed by mid-afternoon. With permit in hand, Griffin assisted McDaniel, Nehalem Bay SP manager Larry Oswald and other OPRD staff to retrieve the cannon during the low tide on February 19th. Shovels were used to remove sand around each of the cannons so that woven straps could be placed around the cannon so they could be lifted using a backhoe and placed on the back of a pickup for transport to Nehalem Bay State Park. Efforts were made to place the cannon immediately in tubs that could be filled with saltwater to maintain a saturated condition. However, the tubs OPRD

staff had brought to the beach to house the cannon were found to be too small so the cannon were each placed in the back of a truck and wrapped in plastic in order to keep them moist until larger tanks could be purchased. It was understood that it was important to keep all recovered artifacts submerged under water so that they won't dry out and begin to deteriorate. To assist in this process, the following morning OPRD purchased two large plastic tubs (6' diameter) and the cannon were paced in a bath of fresh water on Wednesday morning, February 20th.

Artifact Description

Seven artifacts were recovered during the cannon salvage operations. These included: two cannon covered with concretions, three pieces of probable rusted chain, a piece of wood discovered beneath one of the cannon during recovery operations, and a small metal pipe fragment (chrome?) that is now believed to not be associated with the cannon. Descriptions of each artifact are included below.

1. Cannon 1: Cannon 1 measures 5'4" long x 3' high x 2'7" wide (see Photograph 7). A metal base is exposed on the cannon measuring 5" long (approx. 4" dia.) from the carriage board, with an 8.5" long x 5" wide x 1" thick metal top appendage (Photograph 8). This appendage is believed to have once attached the cannon to a swivel on the ship's deck. At the base of the cannon is a large wooden plank (carriage board) thought to measure 3' long x 1.5' wide x 4" thick. These measurements are extrapolated from measurements taken from Cannon 2, which is less covered by concretions than Cannon 1. The cannon is totally covered by rock and a black layer of concretions that covers the cannon and wooden base in mass.

Cannon 1 was moved from its originally discovered location by OPRD staff on the evening of February 18th. The concretions from a small area of the wooden base were removed when it was moved up the beach to keep the cannon from being lost (see Photograph 6 for position of chain that removed concretion area on board). The wood appears to be in an excellent state of preservation.

2. Cannon 2: Recovered from its originally found location, this cannon measured approximately 5' long x 1'11" wide x 2'6" high (Photographs 9 and 10). On the base of the cannon was a wood base measuring 3'3" x 1'8" x 5'5". This includes a 7" base attachment that would have once attached the cannon to the carriage swivel. If one was to subtract the concretions that cover most of the carriage base, the original dimensions probably measure 3' x 1.5' x 4". This base is much more distinct than that seen on Cannon 1. Like cannon 1, this cannon is totally encrusted with rock, shell and sand.

On the left side of the cannon housing, a portion of a broken metal ring can be seen. It is not known when this ring was exposed to the elements since it was seen prior to the current recovery efforts. Nothing of the cannon's true shape can be seen aside from its basic shape and broken side metal ring.



Photo 7: View of Cannon 1 from back of cannon



Photo 8: Close-up of base fitting on Cannon 1



Photo 9: Side view of Cannon 2.
(Note exposed metal ring on side of cannon)



Photo 10: Top view of Cannon 2

3. Artifact 3 comprises a piece of rusted chain measuring 1' x 7.5". The artifact is totally encrusted by rocks, rust and concretions and weighs over 10 pounds. That this artifact is a piece of chain from the original ship is only a guess since the true shape and dimensions cannot be clearly seen (Photograph 11).
4. A large two-part chain covered in rock concretions was found by local beach comers and turned over to OPRD staff for conservation. This piece of chain contains two pieces of chain with an exposed link linking the two fragments. Fragment one measures 12" long x 6" wide x 5" thick. Fragment two measures 12" long x 10" wide x 6" thick (see Photograph 12).
5. A small piece (9" x 5" x 5") of rusted chain was recovered from the beach. No portion of chain is actually visible but rust can be seen through the encrusted rocks.
6. A small wood fragment was found underneath Cannon 1 after it had been removed from the beach. It was not known at the time if the wood fragment was part of the cannon's base and had been dislodged during the removal process or if it was not associated with the canon at all. The piece was collected and stored with the cannon. The wood fragment measures 13" long x 3" wide x 2" thick. Cut marks are visible on one end with it splintering to a narrow wedge on the opposite end. Upon later examination of the cannon, this artifact is not believed to be associated with either cannon (see Photograph 13).
7. A small portion of a metal pipe was turned into OPRD staff by a local youth who had found it on the beach north of where the cannon were recovered. The pipe fragment was encrusted with rock concretions showing that it has been submerged for some time. The pipe measured $3 \frac{7}{8}$ " x $1 \frac{5}{8}$ " x $\frac{7}{8}$ " with a 1" long collar on one end fastened by a small nut. The pipe may be chrome, which would mean that it is not associated with the cannon and wreck (see Photograph 13).

Short Term Conservation Efforts

All artifacts recovered under Archaeological Permit 1089 were placed within two six foot diameter water tanks and submerged to retain a waterlogged environment. A small portion of each cannon stuck above the water level and these areas were wrapped in wet burlap and kept constantly wet. Originally professional conservators instructed us that the cannon and chain fragments should be submerged in a bath of fresh water. We were later instructed that the desalination process should be a gradual effort with ever lessening amounts of saltwater with a respective increase in fresh water.



Photo 11: Artifact 3 - Chain fragment



Photo 12: Artifact 4 – Double-linked piece of chain fragment



Photo 13: Miscellaneous artifacts recovered during cannon recovery

A regime was begun to change the water once a week, each time reducing the amount of saltwater and increasing the freshwater in the tank; the first week consisting of a 50/50% solution of fresh water to saltwater. The second week the ratio of salt to freshwater changed to 25/75% solution, 3rd week a 13/87%, 4th week 6/94% solution with the 5th and every following week comprised of 100% freshwater. A 2% borax acid/borax solution was also added to the water with each change to reduce the chance of any organism growing in the tank (Robinson 1981:29). Borax is especially helpful in preserving objects that contain wood but will also assist in preserving iron. The reduction from saltwater to freshwater regime was recommended by professional conservators and published sources.

“The problem here is that the aqueous environment within the object..... will have a high salt content whereas there will be a very low concentration in the fresh or distilled water. When placed in the [fresh] water an osmotic pressure difference will be created between the two regions of different salt concentrations, and this pressure might cause deteriorated surfaces to exfoliate. For the first wash, therefore, a 1:1 ratio of seawater to fresh water is recommended. The seawater concentration is then reduced slowly over a period of two weeks, when fresh water and finally distilled or deionized water can be used. Final washing must be carried out in the laboratory where there are facilities for the correct monitoring of water conductivity and chloride levels to determine the completion of washing.” (Pearson 1987:114-115 in Dean 2008).

Long Term Conservation and Recommendations

OPRD has contacted several professional conservators and are now seeking bids for long-term preservation and conservation of the cannon and associated chain fragments. Once a conservation facility has been selected, the cannon and all cannon associated artifacts will be transferred to their lab for conservation. Conservation

efforts are estimated to take from 3-5 years before being completed. Once conservation has been completed the cannon and chain will be sent to suitable facilities for long-term curation and exhibition. Depending on the history of the cannon and their association with a local shipwreck, the owner of the cannon (e.g., State of Oregon, US Navy) will assist in selecting the final curation facility. Given the high degree of interest in the cannon among Oregon residents, it is important that public education be considered an integral part of later curation efforts. An Advisory Committee made up of representatives from interested agencies is being assembled to address issues relating to the conservation and final disposition of the cannon. Agencies expected to have a role in this process include: Oregon Department of State Lands, Oregon Parks and Recreation Department and the State Historic Preservation Office, US Navy, Columbia Maritime Museum, Cannon Beach Historical Society, and Arch Cape residents. Others will surely be included as the review process continues.

The actual conservation techniques that will be used to preserve the wood base and iron cannon will depend on the lab that is selected. Techniques vary and professional conservators will be consulted to determine the most appropriate techniques that are needed for the recovered artifacts. An initial step that OPRD will seek is to obtain an x-ray of the cannon prior to shipment to the selected lab. X-ray results should help us to determine two important factors. First, the basic shape of the cannon so that it can be compared to stylistic changes in cannon morphology to determine if they indeed came from the USS Shark or another ship that may have wrecked off the Oregon coast during the nineteenth century (see Figure 5). Second, an x-ray of the cannon will also help to determine if the cannon are still loaded and if extra precautions need to be followed prior to shipment to the lab. Cannon conservators have estimated that 75% of the cannon found in shipwrecks remain live and care needs to be taken with their handling. If the x-ray shows a cannon ball is still lodged within the barrel of the cannon there is a chance that the powder from the cannon could still be dry and the conservators will need to be made aware of this prior to removing the concretions on the cannon.

In talking with professional conservator Brad Rodgers, from the East Carolina Maritime Program, we were informed that regular portable x-ray machines would not be sufficiently strong enough to be useful in determining the shape of the cannon nor their potential for being loaded. Iron from the cannon would have leached out while underwater and have now been integrated within the concretions that encapsulate both cannon. The iron signature from the cannon would now surround the entire artifact making it difficult to determine a distinct shape or be able to penetrate the cannons' barrel unless the voltage could reach as high as 350-400 kilovolts. This would mean an industrial x-ray machine would be needed. OPRD is now seeking information on the availability of such a unit in the region in order to obtain an x-ray of each cannon.

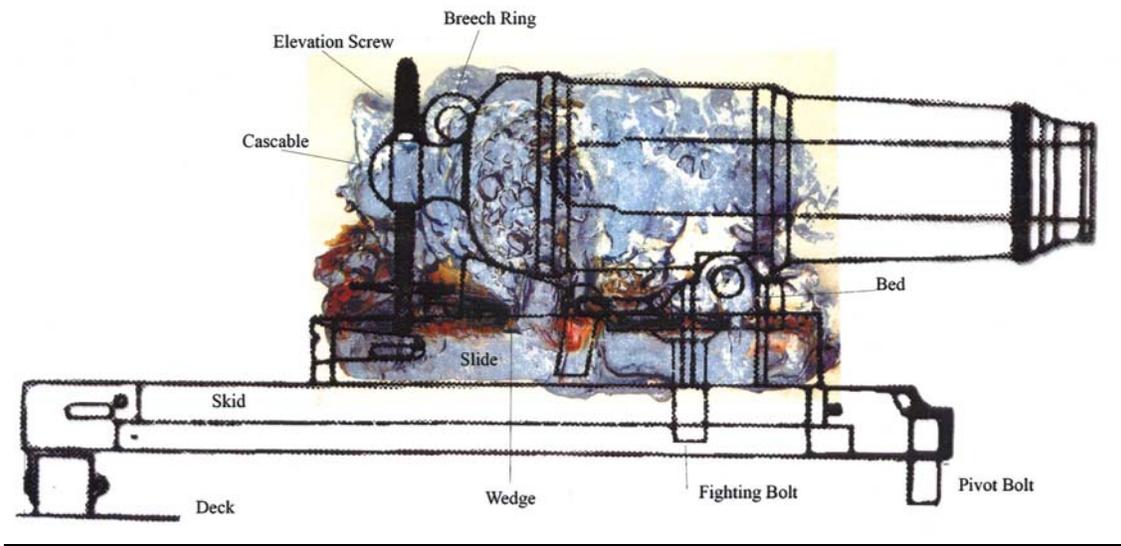


Figure 5: Overlay of American Navy cannonade (circa 1830) on color photo of Arch Cape artifact showing corresponding elements. (Courtesy of Columbia River Maritime Museum)

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Photo 2: USS Shark cannon recovered from Arch Cape Beach in 1898

Photo 3: Capstan from USS Shark recovered in 1898





Photo 4: Replica of 1898 Cannon cast in 1952 for City of Cannon Beach



Photo 5: Replica of 1898 cannon cast in 1991 for community of Arch Cape

Appendix

1. Shipwrecks Near Columbia River
2. Isolate Form

