Queen Anne's Revenge

Laboratory Excavation Report, February 2003

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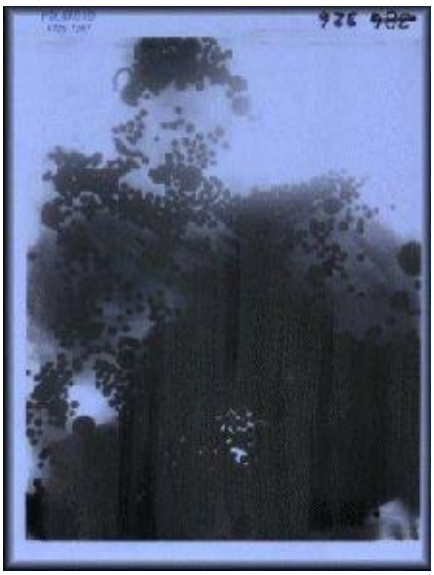
Laboratory technicians tackled several larger and more complex concretions during February, resulting in fewer artifacts being processed but some fascinating discoveries.

One of the larger concretions, *QAR* 060, contained the iron components of a large geared jack, identical to one discovered on the wreck of the slave ship *Henrietta Marie* (1700). Identification of this curious machine was made possible by David Moore, an archaeologist with the North Carolina Maritime Museum and authority on the *Henrietta Marie*.

In gross appearance, the geared jack resembles an old-fashioned automobile bumper jack, although it worked more like a modern hydraulic jack. The ram consisted of a slotted bar with a forged saddle on the end that made contact with the load. The bar passed through a gearbox, containing a gear that meshed with the slots on the ram. The gear was powered by a hand crank (missing) that enabled the user to apply or release pressure on the load. A wooden housing, also missing, provided a foundation for the jack that was placed on the load-bearing surface during use. It is likely that this jack was part of the ship carpenter's tool kit, used to effect repairs on interior structural members of the ship's hull.

One of the most exciting discoveries was that of a flintlock gunlock embedded within a concretion containing large amounts of lead shot (*QAR* 326). The gunlock appears to be a standard flintlock although the cock exhibits characteristics attributable to an earlier style flintlock called a doglock. It is possible that this lock was repaired using a salvaged cock. It is notable that the cock on the *QAR* 326 gunlock is nearly identical to a solitary cock found on the 1717 pirate shipwreck *Whydah Galley* (Hamilton 1992:261). It was quite a surprise to find a nearly intact gunlock, considering the high degree of corrosion experienced by most fragile iron artifacts from the *QAR* site. The *QAR* 326 concretion contained, along with the gunlock and numerous lead shot, a number of corroded-nail molds. It is unclear why the gunlock survived and adjacent nails corroded completely, but differential preservation of artifacts is evident in nearly all concretions.

Numerous factors can affect the rate of corrosion of a metal artifact within a shipwreck. Neighboring artifacts may act upon the artifact as anodes or cathodes, galvanically protecting it or causing it to corrode to a more elemental state. Exposure to the seawater greatly accelerates corrosion of nearly all metals thus making it advantageous if the artifact is quickly buried within the bottom sediments (and stays that way). If only considering these two factors, in



combination with a wrecking event, and 280 years of submersion within the dynamic environment of Beaufort Inlet, one can imagine why it is so difficult to explain, much less predict, the degree of preservation of an artifact embedded in concretion.

Radiography (x-ray photography) is a valuable tool for the detecting the presence of metal artifacts in a clump of concretion. Iron objects can be distinguished from those fashioned of more noble metals (brass, gold, or silver, for example) and their degree of preservation determined to some extent. The results, however, must be viewed with caution. For instance, the gunlock (*QAR* 326) did not show up in the x-ray photographs, due to the large amount of lead shot in the concretion that shadowed the artifact (x-rays do not penetrate lead).

X-ray photographs are also two-dimensional. It is impossible to determine the depth of an artifact within the concretion. For example, one large concretion, previously attached to Cannon #2 (*QAR* 232), was x-rayed several years ago and a large sail needle could be clearly seen in the photographic negative. It stood out bright and white against a background of darker iron bolts (darker because of their higher degree of permeability to x-rays relative to the brass needle). The needle was clearly of a more noble material and looked to be directly under the surface of the concretion. Upon attempting to retrieve the needle, only a forest of badly degraded iron objects appeared beneath the air-scribe tip. Fearing damage to these fragile artifacts, the needle removal was postponed and the concretion placed back in wet storage.

The *QAR* 232 concretion finally arrived at the Fort Fisher laboratory this month and the sail needle retrieval re-commenced. Anticipating that some of the iron bolts would be damaged during the excavation, the concretion was photographed throughout the process to aid in the restoration of the iron artifacts following chloride removal. After ten days of cleaning with the air scribe and casting artifact molds as they appeared, the brass sail needle was discovered nestled within a tangle of iron ringbolts. The needle (*QAR* 232.014) is beautiful and at over six-inches in length, relatively large. In addition to sewing thick canvas sails, it would have been quite useful for sewing small canvas bags, the needle going where the hand couldn't.