ABSTRACT

In November 1717, English pirates captured the French slave-ship La Concorde near the island of Martinque. Led by the notorious Blackbeard, the pirates converted La Concorde into their flagship and renamed the vessel Queen Anne's Revenge. After spending the winter searching for prizes in the Caribbean, the pirate fleet, consisting of Queen Anne's Revenge and three smaller sloops, blockaded the port of Charleston in May 1718. Continuing up the coast, Blackbeard lost his flagship while attempting to enter Beaufort Inlet, North Carolina, and five months later he was killed in a bloody battle at Ocracoke.

Nearly three hundred years later, in November 1996, the private research firm InterSal Inc. discovered a shipwreck in Beaufort Inlet believed to be the remains of Queen Anne's Revenge. Since then, this site, designated North Carolina shipwreck 0003BUI, has been the focus of an intense archaeological examination to determine its condition, affiliation, age, and surrounding environment. Over 30 scientists and technicians from 18 universities and research institutions have participated with the North Carolina Underwater Archaeology Unit in conducting research on this intriguing shipwreck. Over the past three years, divers have spent more than a thousand hours on the ocean bottom examining the site armed with a variety of tools and techniques.

One particularly successful geophysical instrument used at the site is the magnetic gradiometer, which provided a means to accurately predict distribution of iron artifacts beneath the seabed prior to excavation. After taking over two thousand readings at the site, researchers identified potential cannon and large metal artifact targets, as well as the overall distribution of cultural materials. Based on this study, archaeologists are now able to project that this shipwreck was a very heavily armed vessel, and carried at least 24 carriage-mounted cannon at the time of sinking. These results, added to those from a battery of other scientific tests conducted at the Beaufort Inlet shipwreck site, provide a compelling body of evidence to support its identification as Blackbeard's Queen Anne's Revenge.

HISTORICAL OVERVIEW

The pirate Blackbeard is arguably the most notorious of the sea robbers who plagued shipping lanes off North America and throughout the Caribbean in the early-eighteenth century—an era commonly referred to as the Golden Age of Piracy. Despite his legendary reputation, little is known about the early life of Blackbeard. Even his true name is uncertain, though it is usually given as some variation of Edward Thatch or Teach. He is reported to have served as a privateer during Queen Anne’s War (1701 - 1714) and turned to piracy sometime after the war’s conclusion. Maritime archaeologist and historian David Moore, spent considerable time tracing the history of Blackbeard. The earliest primary source document that Moore located that mentions the pirate by name dates to the summer of 1717. Other records indicate that by the fall of 1717 Blackbeard was operating off...
Delaware and Chesapeake bays in conjunction with two other pirate captains, Benjamin Hornigold and Stede Bonnet. Late in the fall of 1717, the pirates made their way to the eastern Caribbean. It was here, off the island of Martinique, that Blackbeard and his fellow pirates captured the French slavership La Concorde—a vessel he would keep as his flagship and rename Queen Anne’s Revenge (Moore, 1997).

By examining a variety of primary and secondary French documents, researchers have pieced together a limited history of La Concorde. The prominent French merchant, Rene Montaudoin, owned the ship, which operated out of the port of Nantes. French records recount three slave trading expeditions of Montaudoin’s La Concorde; one in 1713, a second in 1715, and the third and final voyage in 1717. Unfortunately, records have yet to be located that describe how Montaudoin acquired La Concorde or the date and place of the ship’s construction (Mettas, 1978).

During the eighteenth century, Nantes, located at the mouth of the Loire River, was the center of the French slave trade. For much of that century, the Montaudoin family operated the leading company involved in this nefarious but lucrative trade. Ships would leave Nantes in the spring loaded with trade goods and travel down the west coast of Africa. There, the captain would purchase a cargo of enslaved Africans to be transported to the New World. The transatlantic voyage, known as the Middle Passage, would take up to two months to complete. The Africans were usually sold at the French islands of Guadeloupe, Martinique, or Saint Domingue where they served as laborers in the sugar cane fields. Emptied of their human cargo, ships would take on new freight, usually sugar, and return to France.

The last voyage of La Concorde and the ship’s subsequent capture by pirates are documented in depositions filed by two of the vessel’s officers, Captain Pierre Dosset and Lieutenant Francois Ernaut, when the two finally returned to France. According to Dosset and Ernaud’s reports, La Concorde left Nantes on March 24, 1717. The 200-ton ship was armed with sixteen cannon and had a crew of seventy-five. On July 8, La Concorde arrived at the port of Judas, or Whydah, in present-day Benin. There they took on a cargo of 516 captive Africans. The captain and officers also obtained about twenty pounds of gold dust for their own account. La Concorde took nearly eight weeks to cross the Atlantic and the hardships of the notorious Middle Passage took their toll on both the Africans and the French crew. By the time they reached the New World, sixty-one slaves and sixteen crewmen had perished (Dosset, 1718, Ernaut, 1718).

After crossing the Atlantic, and only 100 miles from Martinique, the French ship encountered Blackbeard and his company. According to Lieutenant Ernaut, the pirates were aboard two sloops, one with 120 men and twelve cannon, and the other with thirty men and eight cannon. With the French crew already reduced by sixteen fatalities and another thirty-six seriously ill from scurvy and dysentery, the French were powerless to resist. After the pirates fired two volleys at La Concorde, Captain Dosset surrendered the ship (Ernaut, 1718).

The pirates took La Concorde to the island of Bequia in the Grenadines where the French crew and the enslaved Africans were put ashore. While the pirates searched La Concorde, the French cabin boy, Louis Arot, informed them of the gold dust that was aboard. The pirates searched the French officers and crew and seized the gold. The cabin boy and three of his fellow French crewmen voluntarily joined the pirates, and ten others were taken by force including a pilot, three surgeons, two carpenters, two sailors, and the cook (Ernaut, 1718). Blackbeard and his crew decided to keep La Concorde and left the French the smaller of the two pirate sloops. The French gave their new and much smaller vessel the appropriate name Mauvaise Rencontre (Bad Encounter) and, in two trips, succeeded in transporting the remaining Africans from Bequia to Martinique (Mettas, 1978).

Leaving Bequia in late November, Blackbeard with his new ship, now renamed Queen Anne’s Revenge, cruised the Caribbean taking prizes and adding to his fleet. According to David Moore’s research, from the Grenadines,
Blackbeard sailed north along the Lesser Antilles plundering ships near St. Vincent, St. Lucia, Nevis, and Antigua, and by early December he had arrived off the eastern end of Puerto Rico. From there, a former captive reported that the pirates were headed to Samana Bay in Hispaniola (Dominican Republic). No historical records have been located to chronicle Blackbeard’s movements during the first three months of 1718, but by April the pirates were off the Turneffe Islands in the Bay of Honduras.

It was there that Blackbeard captured the sloop Adventure, forcing the sloop’s captain, David Herriot, to join him. Sailing east once again, the pirates passed near the Cayman Islands and captured a Spanish sloop off Cuba that they also added to their flotilla. Turning north, they sailed through the Bahamas and proceeded up the North American coast. In May 1718, the pirates arrived off Charleston, South Carolina, with Queen Anne’s Revenge and three smaller sloops (Moore, 1997).

In perhaps the most brazen act of his piratical career, Blackbeard blockaded the port of Charleston for nearly a week. The pirates seized several ships attempting to enter or leave the port and detained the crew and passengers of one ship, the Crowley, as prisoners. As ransom for the hostages, Blackbeard demanded that the pirates be given a chest of medicine. The medicines eventually delivered, the captives were released, and the pirates continued their journey up the coast (Lee, 1995).

Soon after leaving Charleston, Blackbeard's fleet attempted to enter Old Topsail Inlet in North Carolina, now known as Beaufort Inlet. During that attempt, Queen Anne’s Revenge and the sloop Adventure grounded on the ocean bar and were abandoned. Research by David Moore, and others, has uncovered two eyewitness accounts that shed light on where the two pirate vessels were lost. According to a deposition given by David Herriot, the former captain of Adventure, “the said Thatch’s ship Queen Anne’s Revenge run a-ground off of the Bar of Topsail-Inlet.” Herriot further states that Adventure “run a-ground likewise about Gun-shot from the said Thatch” (Herriot, 1719). Captain Ellis Brand of the HMS Lyme provided additional insight as to where the two ships were lost in a letter (12 July, 1718) to the Lords of Admiralty. In that letter Brand stated that: “On the 10th of June or thereabouts a large pyrate Ship of forty Guns with three Sloops in her company came upon the coast of North carolina ware they endeavour’d To goe in to a harbour, call’d Topsail Inlett, the Ship Stuck upon the barr att the entrance of the harbour and is lost; as is one of the sloops” (Moore, 1997).

In his deposition, Herriot claims that Blackbeard intentionally grounded Queen Anne’s Revenge and Adventure in order to break up the company, which by this time had grown to over 300 pirates. Intentional or not, that is what happened as Blackbeard marooned some pirates and left Beaufort with a hand picked crew and most of the valuable plunder (Herriot, 1719).

Blackbeard’s piratical career ended six months later at Ocracoke Inlet on the North Carolina coast. There he encountered an armed contingent sent by Virginia Governor Alexander Spotswood and led by Royal Navy Lieutenant Robert Maynard. In a desperate battle aboard Maynard’s sloop, Blackbeard and a number of his fellow pirates were killed. Maynard returned to Virginia with the surviving pirates and the grim trophy of Blackbeard’s severed head hanging from the sloop’s bowsprit (Lee, 1995).

**DISCOVERY AND RESEARCH**

In 1988, the private research firm Intersal Incorporated received a permit from the North Carolina Underwater Archaeology Unit (UAU) to search for the remains of Queen Anne’s Revenge and Adventure in Beaufort Inlet. Intersal also held a permit to search the same area for the Spanish ship El Salvador, which was lost in 1750. For nearly ten years, Intersal conducted intermittent surveys in Beaufort Inlet with little result. Then, in 1996, Intersal hired shipwreck researcher Mike Daniel to direct field operations. Using historical accounts provided by Intersal President Phil Masters, Daniel selected a survey area that he felt encompassed the inlet’s early-eighteenth century entrance channel and bar. In November 1996, the Intersal crew locat-
ed a shipwreck at Beaufort Inlet that they tentatively identified as *Queen Anne's Revenge* (Figure 1). Researchers based that identification on the large number of cannon observed on site and artifacts dating to the early-eighteenth century including a brass blunderbuss barrel and a bronze bell with a date of 1709. The UAU assigned site number 0003BUI to the newly discovered shipwreck.

Since the discovery of site 0003BUI, field studies have included numerous daylong visits to the wreck site and several month-long expeditions, which usually occurred in the fall of each year to take advantage of favorable weather conditions. The primary purpose of those investigations was to collect basic information to prepare a comprehensive site assessment. Underwater archaeologists established a reference
system to map exposed portions of the wreckage, which consisted of a mound of cannons, anchors, and other cultural debris (Figure 2). Using remote sensing surveys and diver searches, researchers also investigated the area surrounding the site to identify associated materials. Finally, exploratory excavations helped define limits of artifact dispersal and provided valuable insight into the shipwreck site’s layout. The accompanying papers in this volume attest to the involvement of specialists in the associated fields of geology, biology, and history and reach out geographically throughout North Carolina and beyond its borders. The interpretation of the archaeological findings has been greatly enhanced through interdisciplinary participation.

Initial examination of the shipwreck revealed an exposed mound measuring 25 feet (7.62 meters) by 15 feet (4.57 meters). That mound consisted of eleven cannons, two large anchors, a grappling hook, numerous iron cask hoops, several iron deadeye strops used to secure the ship’s rigging, a cluster of cannonballs, and a large number of ballast stones and concretions. Divers located a third anchor 50 feet (15.24 meters) north of the main concentration. The maximum relief above the surrounding seabed is approximately 4 feet (1.22 meters), with most of the exposed remains being less than 2 feet (.61 meters) high.

Intersal conducted a remote sensing magnetometer survey to initially locateQueen Anne’s Revenge. The magnetometer detects variations, or anomalies, in the earth’s magnetic field produced by ferrous objects. Additional surveys conducted in the general vicinity ofQueen Anne’s Revenge located a large anchor south of the main site. The anchor may be associated with the shipwreck since it appears to date from the same time period. Recently, side-scan sonar surveys have been valuable in viewing the surrounding seabed terrain as it relates to the exposed portions of the site.

What has proved even more useful in terms of site interpretation is the use of diver-assisted, magnetometer surveys. This technique provides the means to accurately predict the distribution of buried, iron artifacts prior to excavation. Diver-assisted surveys in which the submersible magnetometer sensor is placed on grid points across the bottom is not new. The first such survey was by archaeologist Jeremy Green during what he referred to as a close-plot magnetometer survey over thirty years ago on the Kyrenia shipwreck in Cyprus (Green, et al, 1967). Green took readings at 2-meter intervals over a 280 square meter area and after contouring the data, was able to predict the presence of buried ferrous materials and/or amphora cargo. During the study, researchers also experimented with the height of the sensor above the bottom in an attempt to determine the mass of the source object.

In 1979, North Carolina geophysicist I. J. Won conducted what he called a precision magnetic survey to evaluate anomaly targets located in Masonboro Inlet near Wilmington, North Carolina. Dr. Won’s primary concern was to determine the depths of the causative bodies. To accomplish this, researchers placed the magnetometer sensor on 10-foot (3.05-meters) centers and at varying heights above the bottom. After contouring the data, Won predicted the source object’s orientation, length, ferrous mass, and depth, which exceeded 25 feet (7.62 meters) beneath the sand (Won, 1980). A major inlet shift is needed to remove enough sand to ground-truth Won’s target; however, the results of his precision survey were promising, as were the close-plot magnetometer surveys conducted by Green and others. After reviewing the environmental characteristics of theQueen Anne’s Revenge site, as well as other remote sensing instruments currently available, the magnetometer appeared to hold the most promise for effectively investigating its buried remains.

The remote sensing instrument used on this site was a Schonstadt Model GAU-30 Underwater Magnetic Locator. This is called a magnetic gradiometer, since the instrument’s sensor is made up of two separate heads and processes data from both to provide a digital readout of the difference between heads. Therefore, much like earlier precision surveys in which the sensor was placed at varying heights, the reading registers only those iron objects that influence one sensor, presumably the lower one, over the
Interim Site Plan
0003BUI
Beaufort Inlet, North Carolina

David D. Moore
North Carolina Maritime Museum
Underwater Archaeology Unit
October 1998

Figure 2. 1998 site plan of shipwreck 0003BUI.
other. Its advantage on the Queen Anne's Revenge site, which contains many large objects, such as cannons and anchors, is the fact that magnetic disturbances from the iron mass laying more than a few feet away affect both sensors the same and therefore is negated. This in turn enables researchers to isolate individual objects directly beneath the sensor. A distinct advantage of the gradiometer over total field magnetometers is its ability to mask diver's only a few feet from the sensor, which markedly increases survey coverage in a given amount of time. The instrument is also not affected by diurnal variations making the processing of data considerably easier and providing more accurate results.

During the 1999 field season divers took 2,064 readings at the shipwreck site every 2.5 feet (.762 meters) over an area 90 feet (27.43 meters) X 150 feet (45.72 meters). Divers pushed the sensor sled down a marked transect line, pausing at each location for a reading, which they signaled to the surface using wireless communication gear, and, once given the okay, continued to the next position. The total effort took approximately forty dive hours. At the completion of the survey, readings were entered into a data management spreadsheet (Excel) and then fed into the Surfer contouring program. After processing the data, the outcome was a road map to the site's buried remains. Two anomalies suspected to be cannon were further investigated. Excavations confirmed that one was a nine-foot, six-pounder (C20) estimated at 1,700 pounds. On the northern side of the site, an anomaly-producing object was recovered and when cleaned turned out to be two small one-pounder cannon (C19 & 21) lying side by side and weighing a total of 514 pounds. Less intense anomaly targets were also matched with previously recorded iron artifacts, such as barrel hoops, and with iron stakes and mooring screw eyes placed there by archaeologists. As excavations continue and physical evidence is compared to the magnetic gradiometer survey, it is hoped that a correlation will be achieved by linking the smallest of iron artifacts, even magnetite in individual ballast stones, with magnetic signatures.

Limited test excavations have been employed to explore the extent of the shipwreck's artifact distribution, while determining what equipment best suits the site. The site's stratigraphy is relatively shallow. With the exception of the fluke on the highest anchor (A1), the exposed portion of the site rises only 2 feet (.61 meters) above the surrounding bottom. This can be deceptive to the diver because often there is a deeper scour area immediately surrounding the exposed wreckage. Moving out from this area, cultural materials are covered by as much as 4 feet (1.22 meters) of sand overburden. The cultural deposits are intermixed with coarse sand and shell in a layer ranging from 9 inches (.22 meters) to 1.25 inches (.03 meters). The vertical dispersion of artifacts depends to some degree on their relative density and the period during which they were deposited. Lighter materials, especially intrusive modern debris such as plastic drink bottles, are nearer the surface, while the heavier objects associated with the shipwreck, such as lead shot, are found at the lowest level. Underlying the cultural layer is a hard-packed stratum of consolidated sands. Artifacts do not appear to have penetrated this layer. While the disturbance of shipwreck materials from ocean currents is obvious, it also appears that the lower portions of the cultural layer may be less affected, as evidenced by a portion of preserved hull structure and the recovery of two intact glass wine bottles.

Evidence from test excavations provided some clues to the extent of artifact dispersion and its nature. Buried materials observed during exploratory excavations on the north side of the site include iron concretions, such as cask hoops and a large number of unidentified objects, as well as a section of wooden hull. Ballast stones were the most dominant artifact found on the east portion of the site, while to the south archaeologists uncovered a rich collection of small artifacts including numerous lead shot, pewter plates and chargers, intact glass wine bottles, pottery fragments, medical and scientific instruments, and even a few flakes of gold.

General site dimensions encompass an area approximately 150 feet (45.72 meters) by 50 feet (15.24 meters). Numerous features associ-
ated with the Queen Anne's Revenge site have been observed and recorded. Twenty-one cannon have been located, the majority of which appear to be 6-pounders. Of the five recovered and cleaned, two are 6-pounders, one a 3-pounder and two are one-pounders. They not only vary in size but in country of origin--two are English, one Swedish and the remaining two are possibly French. Their off-center trunnions indicate a manufacture date in the mid-to late-seventeenth century. At least four of the cannon were loaded at the time of sinking. The Swedish gun, which provides the only manufacture date, 1713, also had a unique load consisting of three large iron rods in addition to a one-pound cannon ball. Loose munitions include various sized round shot, iron bar shot, and lead shot with cloth impressions in the surrounding concretion that may represent bag shot or grapeshot (Lusardi, 2000).

The anchor located on the north end of the site, which measures 13 feet (3.96 meters) in length, has an intact wooden stock and probably represents a bower anchor deployed or dropped from its lashings after the vessel ran aground. The fact that the anchor ring is tucked under the shank and that the anchor lies perpendicular to the orientation of the vessel suggests that it was not set. The two anchors in the center of the site appear to have been stored in the hold of the ship, along with a group of six cannon underneath. Both are approximately the same size as the north anchor. An anchor located 420 feet (128.02 meters) south of the exposed wreckage features a well-preserved wooden stock similar in style to the north anchor. The south anchor is two-thirds the size of the other anchors, and it may represent a kedge anchor set in an attempt to free the vessel from the sandbar since it appears to have been deployed, with its cable ring stretched out and pointing toward the main site.

A section of hull structure approximately 27 feet (8.23 meters) in length and 8 feet (2.44 meters) wide was observed, excavated, recorded, and recovered on the north side of the exposed wreckage. The remains of eleven paired frames, many deteriorated on their upper surfaces, were fastened to a series of extremely well preserved hull planks. Both frames and planks were identified as Quercus sp., oak, white-type anatomy (Newsom, 1999). Sacrificial sheathing, mostly sprung or otherwise dislocated from the hull section was also recovered. Botanical analysis of the sheathing revealed it to be Pinus sp., sylvestris anatomical group (Newsom, 1999). While the absence of the keel, keelson, or other readily identifiable hull feature precludes positive identification of the original position of this section on the ship, based on surrounding evidence it is likely to be part of the vessel's port side just forward of amidships and below the waterline.

Iron hoops that would fit large wooden casks are abundantly distributed throughout the site. Many appear to be stacked inside one another and may have been collapsed for storage. Archaeologists have located a number of iron rings representing ship's fittings such as chain plates and deadeye strops. The calculated size of the deadeyes that fit within the iron strops varies from 8.5 inches (.21 meters) to 11.5 inches (.29 meters) in diameter and matches the size of deadeyes used on ships of several hundred tons.

The concentrated artifact distribution suggests that the vessel sank and deteriorated during a time when there were no significant storms. The dispersion of cultural materials and the direction of the planks and frames contained in the hull section are oriented on a north-south axis and reflect the vessel orientation. The bow of the shipwreck appears to be at the north end of the site and pointed toward shore, based on the location of the north anchor, which probably represents the ship's bower anchor. The collection of valuable artifacts found in the southern portion of the site likely came from the officer's quarters in the stern. Large ballast stones on the east side and the adjacent grouping of anchors and cannon probably were stored deep inside the vessel's hull. It appears that the ship heeled over on its port side after sinking. That finding is supported by the large number of cannon and elements of ship's rigging found along the site's western margin. As the vessel listed to port, those items at or above deck level would have been tossed and deposited in a westerly direction. As excavations continue, these assump-
tions will be tested and a clearer understanding of the site layout will be achieved.

While the shipwreck located in Beaufort Inlet has not been positively identified by a single conclusive piece of evidence, archaeologists and their colleagues who have extensively studied the shipwreck, are certain that the site represents the remains of Blackbeard’s flagship *Queen Anne’s Revenge*. Their confidence is based on mounting circumstantial evidence, which strongly suggests that the site is in the historically reported location and represents a vessel of the appropriate size and armament. Furthermore, the artifact assemblage dates the wreck to the proper time period and compares well with that from the *Whydah*, a contemporary pirate vessel lost a year earlier (Hamilton, 1992). Finally, exhaustive historical research has produced no other shipwreck candidates lost in the area that could possibly produce the archaeological record other than the *Queen Anne’s Revenge*.

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