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STEAMBOAT ARCHAEOLOGY ON THE GREAT LAKES:
THE ANTHONY WAYNE SHIPWRECK SURVEY

by BRADLEY A. KRUEGER

Introduction

Six miles north of Vermilion, Ohio, the fragmented remains of the side-wheel steamer Anthony Wayne rest beneath the surface of Lake Erie. Anthony Wayne and similar packet freighters were charged with moving a great number of travelers and goods all across the Great Lakes region during the 19th Century. The geographic importance of the Lakes is unquestionable, as they serve as a watery nexus between the rivers of the west and the eastern seaboard. Utilization of the Lakes allowed western settlers the option to ship their crops and raw materials to the bustling markets along the Atlantic coast. Conversely, manufactured goods and staples of civilized life could easily be sent westward to the reaches of the newly settled wilderness. Over time, this intra-national shipping network would become increasingly fueled by steam-powered technology. As such, the steamboat became a common sight during this period of western expansion and development, a symbol of both technological ingenuity and economic opportunity for countless individuals in the frontiers of the United States.

Anthony Wayne’s career was unfortunately cut short as a result of a devastating boiler explosion in April 1850. Although the steamer was lost beneath the unforgiving waves, its memory was not forgotten. The remnants of this old steamboat were discovered in September 2006 and since then the vessel has taken on new meaning. For residents of Ohio and the greater Great Lakes community, Anthony Wayne is not just another derelict shipwreck, but rather it serves as a reminder of the strong maritime heritage and tradition upon which this region was founded.

Anthony Wayne also provides a rare opportunity for maritime historians and archaeologists alike. While there are thousands of shipwrecks entombed within the icy Lakes, only a small handful of early, antebellum-era steamboats have been located and studied. Anthony Wayne is unique among these as it represents the earliest archaeological example of a steamboat on Lake Erie, and possibly the entire Great Lakes. This is significant as Anthony Wayne can help answer challenging research questions regarding the ways in which lake steamers were built, outfitted, and propelled.

Innovation and industrialization in the 19th Century brought about several technological advances in a relatively short amount of time, so understanding how and why this progression took place is extremely
important. Even though steam technology in marine vessels was in exis­tence and widely used less than 200 years ago, details and specifics relating to the steamboat's hull and machinery are scarce, and this is especially true in the Great Lakes. Plans and drafts for such vessels were rare to begin with and a large percentage of those that were possibly produced have been lost throughout the years. Thus, the Anthony Wayne Shipwreck Survey is striving to use archaeological data coupled with historical documentation to develop a highly accurate picture of how this steamboat was constructed, powered, and utilized during its golden days upon the water.

Vessel History

_Anthony Wayne_ was built by Samuel Hubbell in Perrysburg, Ohio, in 1837 (Figure 1). Helmed by veteran Lakes captain Amos Pratt, the newly built _Anthony Wayne_ measured 156 feet 6 inches in length, 25 feet 9 inches in beam, 10 feet 10 inches in depth of hold, and was registered with a 390 ton capacity. Designed as a passenger carrier for the route along the southern Lake Erie shore, the steamer could accommodate several hundred travelers and was outfitted with 20 lavish state­rooms, gentlemen’s and ladies’ cabins on the boiler deck, and steerage quarters. In addition to passengers, _Anthony Wayne_ was capable of

Figure 1: The only known contemporary image of _Anthony Wayne_, from an 1838 lithograph.

carrying the equivalent of approximately 1,500 barrels of packet freight below decks.

The steamer was initially owned and managed by the Perrysburgh & Miami Steamship Company, a group of local entrepreneurs involved in Lake Erie shipping. The following year, in 1838, the owners of Anthony Wayne joined with other transportation companies from around Lake Erie and became known as the Western Transportation Company. At the time, this new corporation owned six canal boats operating between Buffalo and Albany on the Erie Canal, and seven steamboats: Commodore Oliver Hazard Perry, Wisconsin, Constitution, Columbus, Rhode Island, Vermillion, and Anthony Wayne. Under this ensign, Anthony Wayne ran regular transportation service from Toledo to Buffalo, opposite the Commodore Perry, and occasionally made trips to the other Upper Lakes, calling at ports such as Milwaukee and Chicago.

Anthony Wayne enjoyed a relatively quiet and successful career for the next several years, but time ultimately took its toll. In 1847, it was discovered that Anthony Wayne was too decrepit to continue on as a steamboat, so the owners decided to convert the old boat into a sailing barge. With all of its machinery and internal apparatuses removed, Anthony Wayne was then purchased by Charles B. Howard & Company of Detroit, Michigan, with plans to completely rebuild the steamer. The hollowed out vessel was towed up through the Detroit River to the shipyards at Trenton, Michigan, where the hull was improved with alterations to its dimensions and cargo capacity, and new cabins and superstructure were erected. Anthony Wayne's old engine went to the newly built steamboat Baltimore and was replaced with a high-pressure, direct-acting horizontal engine from the steamer Columbus. Under the ownership of Charles Howard and his business partner, Captain E. C. Gore, the refurbished steamboat spent the remainder of its days plying the waters of Lake Erie on the Detroit-Toledo-Buffalo shipping line.

The Loss of Anthony Wayne

On Saturday, April 27, 1850, Anthony Wayne started out on its usual run from Toledo to Buffalo with a complement of 30 crewmembers, with scheduled stops at various ports along the way. Under the command of Captain Gore, the side-wheeler departed Toledo around 9:00 a.m. with approximately 30 passengers and came into Sandusky in the afternoon. Here, Anthony Wayne picked up 30 to 40 more passengers and was also laden with a cargo of local wine and spirits, livestock, seeds, and other packet freight. The steamer left Sandusky at 10:00 pm Saturday evening and continued its journey eastward, due to arrive in Cleveland early the next morning.

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Between midnight and 12:30 a.m. on April 28, 1850, while passing Vermilion, Ohio, disaster befell the steamer. The vessel's two starboard boilers suddenly exploded, despite having been inspected by the engineer on watch both ten and five minutes before the accident. The blast instantly destroyed the engine room and badly damaged the superstructure. The cargo of wine and spirits ignited and fire spread rapidly through the vessel. After people recovered from the initial shock, they realized the steamer was taking on water and going down at the head.

Captain Gore and his officers attempted to coordinate lifesaving procedures for passengers and crew, but little could be done to save the steamer. The damage sustained by *Anthony Wayne* proved fatal, and the steamer sank to the bottom of Lake Erie within 15 to 20 minutes. During the sinking, the upper cabins and superstructure were ripped free from the hull and managed to stay afloat. The frightened and injured survivors used this piece of wreckage as a life raft, which was attached to the now submerged hull via the rudder cables, and waited in the cold, dark night for help to come. Captain Gore decided the best option for saving as many people as possible was to make his way to shore and alert other vessels. He and a few others boarded a partly damaged lifeboat and with only one oar made their way toward land. The first mate commandeered the ship's yawl and started out toward the schooner *Elmina*, a few miles off to the west. When Captain Gore reached Vermilion, he took a horse and rode back to nearby Sandusky for help. He reached the town at early dawn, woke the mayor and informed him of the disaster, at which point the steamer *Islander* was dispatched to the wreck site. Several hours passed before the first rescuers arrived, and sadly it was too late for a number of individuals. In all, 38 people lost their lives or were reported missing following the disaster.

The exact cause of the boiler explosion was never determined. The coroner's inquest in the days following the incident deemed that all crew members had acted appropriately and in accordance with established protocol. In a fiery instant, *Anthony Wayne* became another grim statistic in the growing number of Great Lakes steamboat catastrophes.

**Discovery of the Wreck**

The wreck of *Anthony Wayne* was discovered in September 2006 by Tom Kowalczk, shipwreck enthusiast and member of the Cleveland Underwater Explorers (CLUE) (Figure 2). Utilizing side-scan sonar, Kowalczk carefully combed the suspected area of the wrecking event in hopes of locating the ill-fated steamer. Six miles north of Vermilion, Ohio, the side-scan revealed two large objects in relative proximity situated well above the lake bottom, indicating the likely presence of a
shipwreck (Figure 3). Harsh weather prevented Kowalczk from diving on the site for confirmation, but divers from CLUE were able to verify the find in May 2007. The target proved to be an old steamboat broken into two parts: the midship section, complete with two large standing paddlewheels; and the bow section. Given the location of the wreck, the features of the vessel, and its preliminary dimensions, Kowalczk and CLUE concluded that they had indeed located the remains of Anthony Wayne. The discovery of the steamer was announced later that summer by CLUE in association with the Great Lakes Historical Society.

2008 Field Season

The first field season of the Anthony Wayne Shipwreck Survey commenced in the summer of 2008. The crew of archaeologists, divers, and volunteers was led by Brad Krueger from Texas A&M University and Carrie Sowden of the Great Lakes Historical Society (Figure 4). For four weeks, the team braved cold water temperatures, limited visibility, and an army of zebra mussels in order to survey the wreck site. The primary goals of this season were to assess the site, inventory all artifacts, and record all structural and mechanical components of the wreck. The crew, which consisted of Texas A&M University graduate students and volunteers from the Maritime Archaeological Survey Team (MAST),
Figure 3: Side-scan sonar images of *Anthony Wayne*, fall 2006.  

Figure 4: Brad Krueger and Carrie Sowden return from a dive on *Anthony Wayne* in June 2008.
was fortunate to utilize the facilities of the Peachman Lake Erie Shipwreck Research Center at the Great Lakes Historical Society as both a base of operations and lodging quarters. Tom Kowalczk served as the project's captain and was charged with the daily transport of both crew and gear to the offshore waters of Lake Erie.

The first phase of the survey consisted of detailed recording of all structural components protruding up from the soft, muddy bottom of Lake Erie. Mapping was achieved by using a method known as trilateration in order to create an accurate and scaled site plan. To do this, a graduated baseline was established down the longitudinal centerline of the vessel between the two sections of wreckage; from there, measurements were taken from two separate points on the baseline to every feature of the wreck, thus giving the precise location of every element present on the site. Additionally, detailed measurements were taken and sketches completed, of the major components of the site (Figure 5). These include the remains of the port- and starboard-side paddlewheels, the connecting drive shaft, pitman arm, engine linkages, feed-water heater, remnants of the wooden hogging truss, and the steamer's bow.

Once measurements were taken and sketches completed, work began on the second phase of the project, subsurface probing of the lake bottom. The goal was to determine how much of Anthony Wayne lies beneath the soft mud. The two sections of the wreck are separated by a distance of 75 feet with no visible remains or debris present between

Figure 5: Brad Krueger recording the hogging truss of Anthony Wayne, June 2008.
them. Given the limited visibility on the site coupled with the soft sedimentary bottom, five graduated guidelines were established between the two sections. Using a 10-foot-long probe, sub-bottom testing was carried out along the lines in five foot intervals. With over 75 tests, this methodical probing determined that there are, in fact, significant structural remains lying buried between the two sections, albeit under five to ten feet of sediment and mud.

### 2009 Field Season

The data gathered from the 2008 season yielded exciting results, but ultimately left more questions than answers. Knowing there was structure of some kind buried between the two sections of wreckage hinted at the possibility of significant hull remains. Therefore, the Anthony Wayne Shipwreck Survey resumed investigations in summer 2009. Krueger and Sowden returned to the site, along with Kowalczk and a larger crew, for a six week field season. Three principal objectives guided that year's operations: first, locate and uncover elements of the vessel's port-side hull; second, locate and uncover the steamer's horizontal engine; finally, investigate the stern section of the site, where no visible remains are present.

Two objectives for this season involved excavation, therefore several considerations needed to be addressed. First, permits were obtained from both the U.S. Army Corp of Engineers and the State of Ohio so that this type of fieldwork could commence. This was particularly exciting, as these permits were the first of their kind issued by these entities to allow for underwater excavation in Ohio waters. Secondly, given the objectives and the location of the site, logistical factors also had to be taken into account. A 3.5-horsepower Honda water pump, utilized as the project’s dredge, was housed with associated equipment on a small aluminum skiff (Figure 6). This makeshift dredge platform was towed out to the site every day by the dive vessel, Dragonfly, and positioned over the work area. Once the platform was in place, archaeologists would descend to the site, set up equipment, and communicate to the pump operator on the surface via tethered marker buoys. The pump was then activated, enabling divers to remove sediment from the designated areas in an efficient, but careful, manner. All sediment passed through a ¼-inch screen dredge cap, which allowed for the potential discovery of any small artifacts present on the site. In an effort to keep conditions at depth as workable as possible, all dredged sediment was deposited approximately 40 feet northeast of the wreck site.

During the course of the season, two test units were opened, one on the portside of the vessel forward of the hogging truss and another forward of the exposed pitman arm (Figure 7). The first unit excavated
was the one on the wreck’s portside. The goal was to follow the hogging truss timber forward into the mud to see if the team could locate any elements of the hull, i.e. frames, planking, etc.; once hull material was uncovered, excavation would move inboard toward the centerline of the vessel. This would allow the archaeologists to record the shape of the hull at this location, observe construction details, and assess the overall degree of preservation. After two weeks, a 12-foot-long by eight-foot-wide unit was dug that reached a final depth of eight feet. Unfortunately, the truss timber was the only structural element that was happened upon and no smaller artifacts were uncovered, save for an old beer can from the mid-twentieth century. Disappointed but not discouraged, the team then decided to probe the bottom of the test unit to see if they were close to some type of structure. Surprisingly, all of the probe tests conducted within the unit were positive, but still five to six feet deep, too deep for the crew to quickly get at. Time did not allow the team to continue working in this area, as there was still much to do before the season’s end.

After work wrapped up on the first test unit, focus switched to a second unit just forward of the pitman arm, with the intent of locating and exposing Anthony Wayne’s steam engine. There were no historical
accounts or reports of the engine having been salvaged, so Krueger and Sowden were hopeful that it would still be present on the site in some form. The archaeologists began the second round of excavations and followed the pitman arm forward into the mud where they discovered it was connected to the engine's robust iron piston via a crosshead linkage or joint. Excited, the crew worked diligently in zero visibility for the next three weeks to follow the piston and move away the slimey mud. After opening a 20-foot-long by eight-foot-wide unit, their effort paid off. They uncovered the steamer's articulated horizontal direct-acting steam engine (Figure 8). The discovery of Anthony Wayne's engine was remarkable, as it represents one of the earliest archaeological examples of a marine engine on the Great Lakes.
End of the season time restraints did not afford the team a chance to thoroughly investigate the aft-end of the wreck as initially planned. With no visible remains in the stern area, it is questionable as to whether or not hull remains exist buried in this part of the site. Probing was successful in the forward part of the vessel in 2008, but excavation of Anthony Wayne's engine took precedence over starting this phase of the project. The crew was, however, allowed access to a sub-bottom profiler, a device that emits an acoustic signal powerful enough to penetrate the lake bottom substrate. An afternoon was spent with the device and initial tests did indicate that substantial material does lie buried beneath the bottom abaft the paddlewheels for a distance of at least 50 feet. Further testing must be conducted, either manually or by remote sensing, in order to better define the site and get overall dimensions of the vessel.

Site Description

Anthony Wayne lies in 50 feet of water and is situated in two parts, with the bow lying approximately 75 feet to the southeast of the midship section (Figure 9). The two sections of wreckage are nearly aligned with one another, with the bow section slightly skewed to starboard. Both bow and midship are partially buried in fine mud and no artifacts or architectural elements are visible on the lake bottom between the two sections.

The midship portion of the wreck is the larger and more impressive of the two. The most striking features are the two large paddlewheels on either side of the vessel, measuring 26 feet in diameter (Figure 10). With the bottom portion of the wreck entombed in mud, only the upper halves of the paddlewheels are exposed. The majority of the buckets are either broken or missing, while most of the arms, originally totaling 60 on each wheel, are still in place. The buckets that do remain are attached to the arms with both iron through-bolts and U-bolts.

Little remains of Anthony Wayne's hull. Five frames on the port side and four to starboard protrude from the murky bottom and rise from the outboard side of the vessel's wooden hogging truss. The diagonal truss timbers run forward on either side of the vessel before disappearing beneath the mud. The port side exhibits the only visible remains of exterior planking attached to the frames. The planks measure one inch in thickness and are secured to the frames with iron nails.

The paddlewheels are linked together by a thick iron driveshaft that rests just above the lake bottom. Connected to the port and starboard shafts are two iron cranks fastened to the vessel's pitman arm. Also present on the starboard driveshaft are two cams and their
Figure 9: A three-dimensional rendering of *Anthony Wayne* as it sits today on the bottom of Lake Erie. Courtesy of Ryan Lee

Figure 10: Anthony Wayne's port paddlewheel, June 2008. Andy Morrison
respective frames (Figure 11). Two connecting rods, or rock shafts, are connected to each cam frame and run forward, parallel to the pitman, into the lake bottom. On the port side of the vessel, immediately forward of the driveshaft, is a freestanding crosshead pump connected to a tall vertical timber (Figure 12). There are connections situated on the base of the pump intake, but none of the associated pipes survive. Forward of the pump is the large cylinder that stands alone near where the pitman arm disappears into the mud. The cylinder, believed to be a feedwater heater, rests close to the pitman arm with its exhaust opening facing upward.

Anthony Wayne’s engine appears to be generic in style for a 19th-Century steam engine. Four exhaust valves and levers adorn the top of the engine which were operated by two lifting arms or wipers (Figure 13). These wipers oscillate back and forth, lifting the exhaust levers, allowing steam to enter the cylinder from one end while being expelled out the other. The wipers are attached to a control rod which is manipulated by two cam linkages. As the cams rotate on the drive shaft, the surrounding cam frame moves back and forth, thus moving the cam linkages; this manages both the rhythm and power of steam in the engine. Despite the textbook appearance of the steamer’s engine, the team did discover some unique features. First, an ‘S’-shaped crank was found on the forward starboard-side of the cylinder, which possibly

Figure 11: Two cams and their frames on the starboard drive shaft, June 2008.
Andy Morrison
Figure 12: Crosshead pump, June 2008.

Figure 13: Steam exhaust lever and valve, August 2009.
served as a throttle that controlled the amount of steam entering the engine from the boilers (Figure 14). Secondly, a small ornately crafted globe with attached funnel and lever was found on the aft-end of the engine (Figure 15). This was likely a reservoir for oil or lubricant that kept the engine running smoothly. After the digging had ceased, the crew took great care to carefully sketch, measure, and photograph the steamer’s engine and associated machinery. In an attempt to ensure preservation of this unique mechanical artifact, the test unit was backfilled with discarded sediment before the close of the field season.

The bow remnants of Anthony Wayne lie some 75 feet forward of the midship section (Figure 16). This section is much more scant than the other, but exhibits interesting features nonetheless. The exposed wreckage is triangular in shape and mainly consists of the rail-cap, spindles, and base, all connected by transverse timbers. While the upper rail is detached from the lower base, some of the spindles remain suspended from the rail-cap. The cap is fitted with a rectangular notch and an iron eyebolt on each side to allow a cable or line to pass through; a third iron eyebolt is found on the cap’s breast-hook. Abaft the apex of the rail are two tall stanchion posts that are attached to a beam that runs athwartships and would have been used in towing or heavy lifting.

Figure 14: ‘S’-shaped crank, possibly the engine’s throttle, August 2009.
David VanZandt
Figure 15: Globe-shaped lubrication reservoir, August 2009. David VanZandt

Figure 16: Anthony Wayne's bow section, June 2008. Andy Morrison
operations. Protruding from the front of the bow are two sturdy catheads that were used to raise and lower the steamer's anchors, each having a tackle situated on the outer side (Figure 17). Finally, beneath the catheads and off to the sides, two large wooden anchor stocks with an iron band barely stick up from the soft mud. The iron shaft and flukes of the anchor are completely buried and could not be assessed.

A high degree of biofouling is evident on the site, as zebra and quagga mussels have attached themselves to several areas of the wreck in abundance (Figure 18). Divers had to exercise great care as the shells of these freshwater mussels can be razor sharp and extremely dangerous if proper protection is not worn. On several areas of the wreck, the mussels have formed very large clusters, obscuring all details. There is a thick layer of discarded shells from deceased mussels located in the inboard area of the midship section, indicating the *Anthony Wayne* has been a victim of these invasive species for some time.

After being in a waterlogged environment for 159 years, most of the remaining components of *Anthony Wayne* have proved to be resilient. Some of the wooden features are more fragile than others and this is especially true for the thinner pieces such as the buckets and hull planking. The wood is soft and prone to damage or breakage, and great care was taken in examining these elements. The iron components have fared better, although a corrosion layer is present on all ferrous objects. The site appears to be in stable condition at present, although it is unclear how the presence of invasive mussels will affect the long-term integrity of the site.

**Conclusions**

Fieldwork on *Anthony Wayne* has now wrapped up, but there is still much left to do. The data collected from the two seasons continues to be studied, analyzed, and checked against a variety of 19th-Century texts. Further research into the historical record may help fill any gaps that remain pertaining to the vessel's construction, career, and loss. As for the wreck itself, the Great Lakes Historical Society is currently working to get the site listed on the National Register of Historic Places, which would be the first shipwreck on the register from the state of Ohio. The *Anthony Wayne* Shipwreck Survey is pleased to have contributed a small but exciting chapter to the ever growing compendium of Great Lakes maritime history.

**Acknowledgements**

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Figure 17: Portside cathead protruding from the bow, June 2008. Andy Morrison

Figure 18: Invasive freshwater mussels cover most of *Anthony Wayne*, August 2009. David VanZandt
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Anthony Wayne Shipwreck Survey 2009 crew: (top row, left to right) Matt Mossman, Tyler Cullinan, Tom Kowalczk, Mike Mossman, David VanZandt; (bottom row, left to right) Will Moser, Carrie Sowden, Christine Misterka, Bradley Krueger; (not photographed) Heather Jones, Taylor Brooks.