
APPENDIX 1

A Comparative Analysis of Three Sailing Merchant Vessels from the Carolina Coast

By Christopher F. Amer Ph.D

South Carolina Institute of Archaeology and Anthropology
University of South Carolina

and Frederick M. Hocker Ph.D

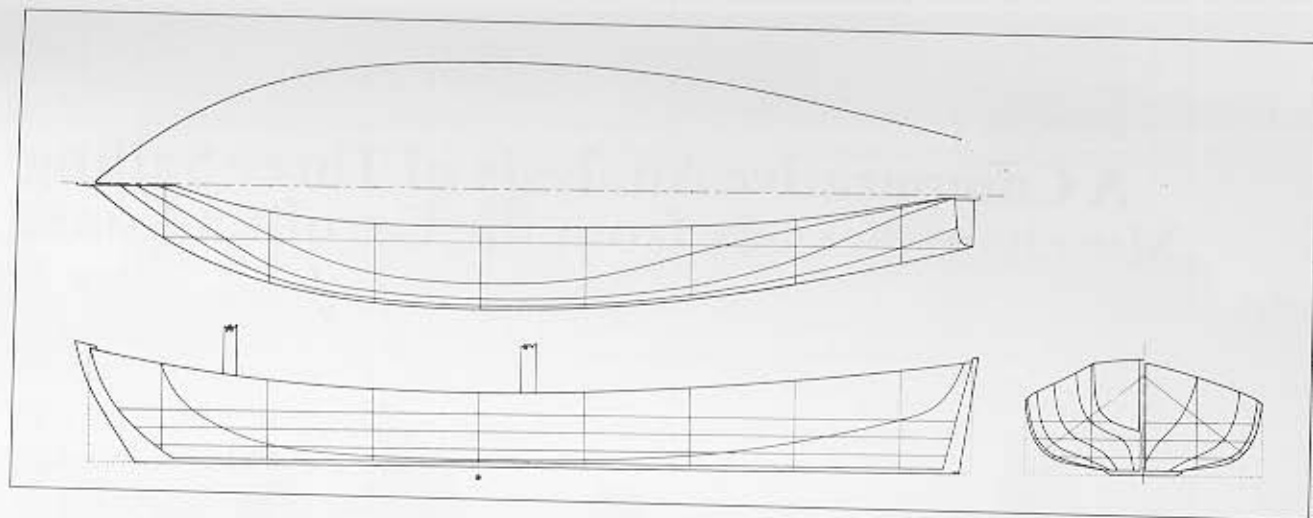
Institute of Nautical Archaeology
Texas A&M University

We are fortunate that we do not have to rely exclusively on historical accounts, old drawings, and modern survival for our understandings of the development of coastal watercraft in Georgia and the Carolinas. Over the last 20 years, a number of archaeological finds of boat remains dating back to the mid-18th century have contributed substantially to our knowledge of tidecraft and the people who built and used them. More than a collection of technical details, such as wood types, hull forms, fastener sizes, and joinery angles, these vessels represent the products of a number of technological, economic, political, and cultural factors. As such, they are a reflection of a vanished society, a reflection in which we can see the settlers, farmers, merchants, and watermen of the southeastern American coast.

Put another way, all watercraft exist within a cultural, historical, and architectural context and therefore have significance within those contexts. Cultural context relates to understanding the society that designed and built watercraft. Historical context refers to the boat's relationship with particular people, places, and events, while architectural context relates the form and construction of the vessel to available information on similar boat types.¹ Recent watercraft can be placed within these contexts by using historical and ethnographic sources as well as recording the vessel itself. But as we move back in time there is an increased reliance on historical documents and archaeological remains to answer our questions until we reach a time when the only information available is the artifact and its physical context.

Written records can tell us about the society of a particular time, the lives of the designers and builders of a vessel or vessel type, and of its users, whether they were merchants or naval men. Contemporary plans and drafts of watercraft can give us insights into the planned design and construction of a vessel or type; however, unlike naval and large merchant ships, which were often drawn and described in dimension and detail down to the tacks used to attach copper sheathing to the hull, smaller commercial craft such as many of those described in this book were more often than not built without the aid of plans. They were constructed using traditional methods handed down through the generations or were adaptations of local indigenous craft, and the builder was often the designer and owner. Even where drawings were used, plans for boats and small craft built much before World War I are rare and all too often nonexistent.

Archaeology has the potential to provide a level of detail not recorded in documents or in oral histories. It can help define the evolution of vessel types by revealing variations in building practices and techniques over time and the



Drawing by F. M. Hocker

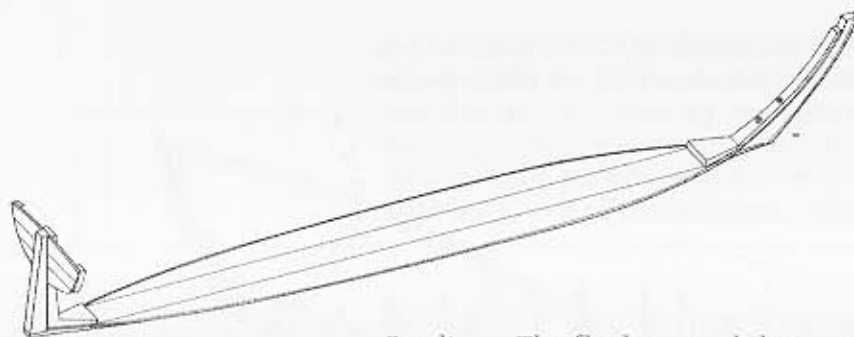
Reconstructed lines to the inside of the plank of the Brown's Ferry vessel.

speed with which those practices spread. By studying tool marks and construction techniques, as well as changes in hull shape, repairs, and alterations, we can learn about the technical skills, inventiveness, and aesthetics of the builders and users; these are in turn the results of their training within the particular cultural climate in which they lived. The materials used to construct the boat relate to the period's timber resources, woodworking and ironworking technology, and quality and efficiency of workmanship. Artifacts within the hull are not only useful for dating the vessel but may include cargoes, which point to a vessel's function as well as its port of origin and destinations. So too, personal artifacts can speak reams about the crew and passengers and their lives aboard ship.

Even though the boat itself is usually the primary source, the archaeological context of a wreck site (that is, how the hull relates to the water and mud in which it was found) is often the single most important aspect leading to accurate interpretation of the vessel. It can often provide answers to most of the questions regarding the vessel's presence in a particular location, when and how it was used and for what purpose, when and why it was lost or abandoned, and who built or owned the craft.

In recent years several ship-built vessels have been studied along the waterways of South Carolina's coastal plain. These include round-hulled colonial and federal sloops,² 18th- and 19th-century flat-bottomed, merchant "coasting schooners,"³ 19th-century lumber ships, and a fishing vessel.⁴ While these craft exhibit a wide range of designs and construction methods and were studied in varied contexts within the state, they all met requirements of form and function to support the needs of a rapidly growing region. The growth of the southeastern colonies created a demand for tonnage, both for exchange between agricultural producers and central markets and for communication between coastal towns. To meet this demand, a large number of small and medium-sized watercraft were required. Some of these vessels were built in shipyards located near major population centers, such as Beaufort, Charleston, and Georgetown; however, many of the colony's tidecraft were constructed on the banks of the numerous plantations along the waterways of the coastal plain.

Following are accounts of three well-preserved examples of tidecraft from archaeological contexts in South Carolina. The Brown's Ferry vessel, the Malcolm boat and the Clydesdale Plantation vessel were excavated from different areas of the state's coastal plain, and each has its own unique historical and cultural affiliations. Temporally the vessels span the second half of the 18th century. Each craft represents particular aspect of the complex network of local, coastal, and long-distance trade within colonial/federal Georgia and the



Drawing by F. M. Hocker

Isometric view of the initial steps in the construction of the Brown's Ferry vessel; the three bottom planks have been laid and cut to shape, and the stem and the sternpost have been attached.

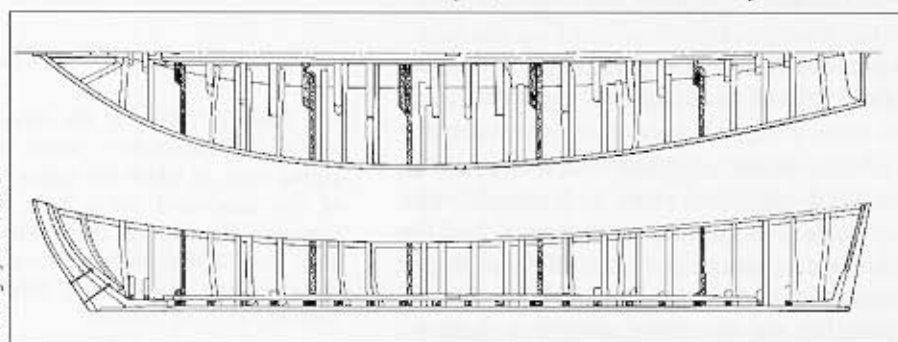
Carolinas. The flat-bottomed design of the Brown's Ferry vessel was ideal for transportation within the protected waterways of the colony and for brief coastal hauls, while the latter vessels possessed design characteristics which would have allowed them to venture into open water and to carry on trade with other colonies and offshore markets.

As a basis for comparison of these three sailing craft we will explore the general qualities of coastal sailing vessels that are discernable in the three examples as well as differences in design, form, construction, and function. The latter characteristics are attributable to specific requirements dictated by such factors as differing origins and boatbuilding traditions of the builders, environment, trade, and specific conditions in the waters they navigated. In addition to these three vessels, data from other wreck sites in the region are helpful in attempting to identify chronological trends of tidecraft evolution.

The Brown's Ferry vessel, which was discovered in the Black River, near Georgetown, South Carolina, in 1971 (Fig. 2), is the oldest identified example of non-Native American boatbuilding in the southeastern United States.⁵ Artifacts associated with the hull indicate that it sank around 1750, while carrying nearly 25 tons of building bricks. The well-preserved remains of the hull were raised in 1976. Careful study of the timbers reveal a surprisingly sophisticated design for a flat-bottomed riverine and coastal schooner, as well as an unusual mixture of European boatbuilding methods, possibly influenced by Native American logboat traditions.

The hull, originally 15.32 meters (50 ft. 3 in.) long, 4.32 meters (14 ft. 2 in.) in beam, and 1.22 meters (4 ft.) deep amidship (Fig. 1), is based on a heavy, leaf-shaped, flat bottom made up of three thick, straight planks (Fig. 2). This bottom

is relatively narrow, only 1.36 meters (4 ft. 5.5 in) wide at its greatest extent. The yellow pine planks are not fastened to each other but are held together by the 20 frames treenailed to them. This method of bottom construction is reminiscent of methods in common use for inland craft in England and the Netherlands since Roman times. At the ends, the stem and sternpost are treenailed directly to the upper face of



Drawing by F. M. Hocker

Longitudinal section and construction plan of the Brown's Ferry vessel.

the central bottom plank and reinforced by an apron forward and inner post aft, treenailed to the bottom and posts. Although nothing of the sternpost survived, it was probably of live oak like the other post elements, and nearby structure indicated that it carried a small transom.

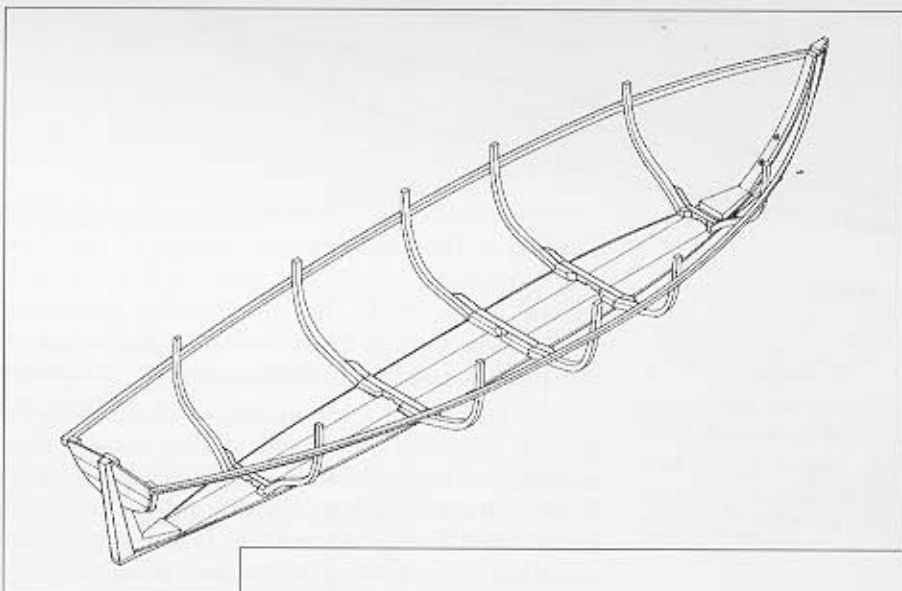
The live oak frames are each made up of a more or less symmetrical floor timber and a pair of futtocks, which are consistently placed abaft the floors (Fig. 3). In five of the frames the futtocks are fastened with nails and treenails to the floor timbers. These five frames, including the midship frame, are fairly evenly spaced over the length of the bottom and provided key molds for the

shaping of the hull. Careful recording of the shapes of the frames indicates that the curves were drawn using a crude method of whole molding, in which a single shaped was used for the turn of the bilge and side throughout the hull.

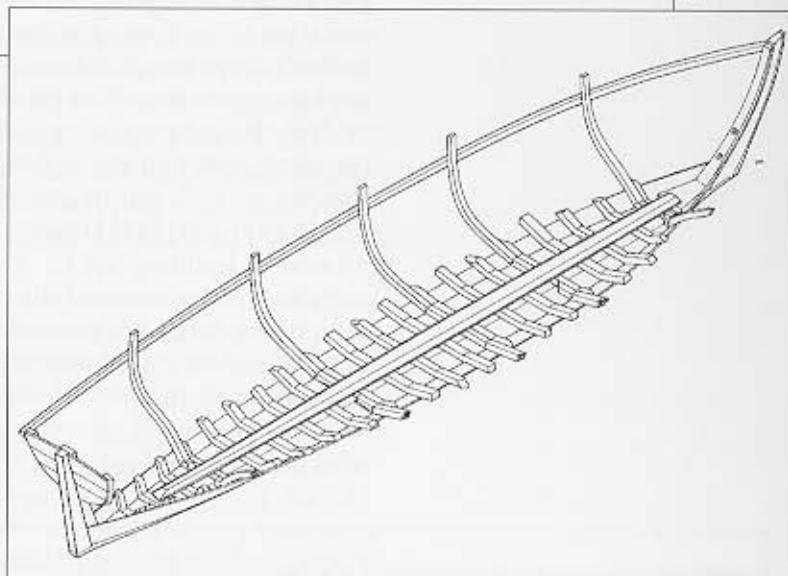
After the first five frames were erected, the garboard was fitted to the bevel worked in the outer edge of the bottom (Fig. 4). Once fastened in place, it provided a guide for the deadrise of the remaining floor timbers. With all the floors installed and a batten (or perhaps the wale) tying the heads of the made frames together, the broad, deeply chamfered, cypress keelson with its two maststeps could be treenailed in place and the rest of the futtocks could be fitted (Fig. 5). Afterward, the planking was nailed and treenailed to the bilges and sides. Rather than fairing the frames and dubbing flats for the broad pine planks, the boatbuilder chose to back out (hollow) the planks to fit the frames. The sides were completed by the cypress wale and a heavy toerail nailed to the upper surface of the wale.

There is no indication of deck structures, although a knee was found loose in the hull. A windlass and its bitts were found forward, and the crude step nailed to the top of the apron just forward of the foremast was probably for a bowsprit bitt or a pawl post. There must also have been partners of some sort for the two masts. The central hold was probably open over most of its length, as the stack of bricks discovered in the ship would have risen to near the top of the rail.

The shape, size, and construction of this vessel suggests that it may be an extremely developed form of the periagua, a common river and coastal merchant vessel of the period. Such craft, ultimately derived from logboats, had the shallow draft to venture deep into the river systems of the coastal plain and a flat bottom to allow them to take the ground in the tidal reaches of the low country for loading and unloading, but were limited in coastal sailing to sheltered waters behind the barrier islands. The sophistication of this little schooner suggests that it was probably only barely recognizable as a periagua, was intended for somewhat better coastal performances than the average barge or log-based periagua (why else the carefully molded shape?) and had been built by a shipwright with some training in the standard European construction traditions of his day. The unusual mixture of bottom-based construction (possibly derived from a log or raft tradition, either imported from Europe or descended from earlier, Native American influenced logboats in the Carolinas) with the conventional, whole-molded framing suggests fairly wide experience on the part of the shipwright.



Drawing by F. M. Hocker



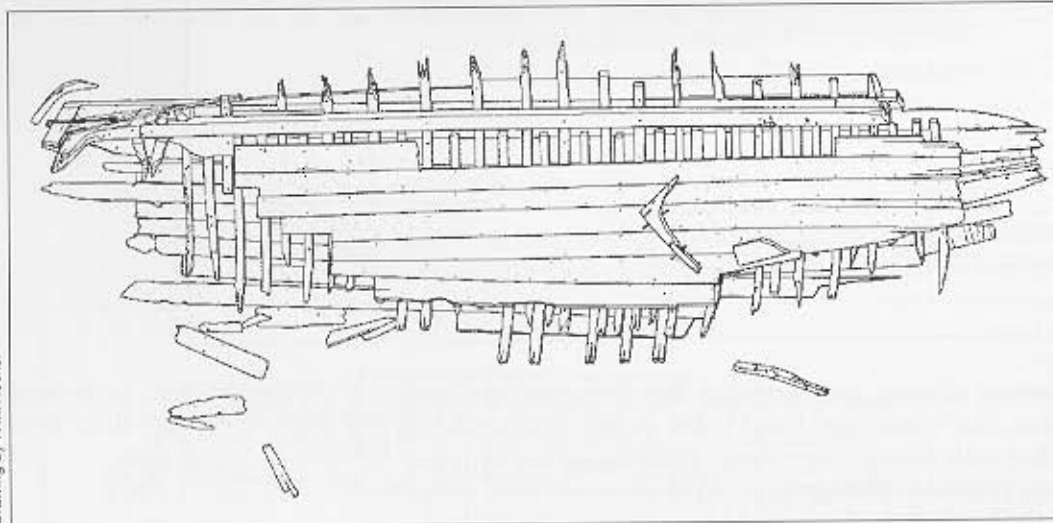
Drawing by F. M. Hocker

Isometric views of the construction of the Brown's Ferry vessel. In the second view, in which the upper parts of the starboard sides have been removed for clarity, the garboards have been added and the remaining floor timbers have been inserted. Drawing by F. M. Hocker.

In contrast to the Brown's Ferry vessel, the Clydesdale Plantation sloop, excavated in the Savannah Back River in 1992 (Fig. 6),⁶ is much more conventional in its use of framing on a heavy keel. The vessel is not easily dated, as it had been stripped and deliberately buried to stabilize a rice bank (levee), but it was probably buried sometime between 1780 and 1820. It is somewhat smaller than the Brown's Ferry schooner, only 13.43 meters (43 ft. 9 in.) long originally, 4.70 meters (15 ft. 5 in.) in beam, and 1.90 meters (6 ft. 3 in.) deep amidship. In contemporary terms it would have measured between twenty and twenty-five tons burden.

A deep yellow pine keel formed the backbone of this little vessel. The keel is relatively large for a sloop of this size but was probably intended to provide added lateral resistance and improved sailing performance with a powerful

Drawing by F. M. Hocker



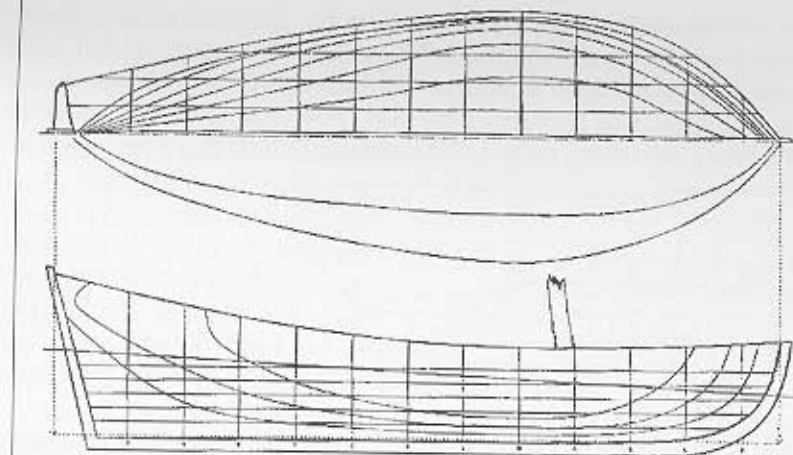
Remains of the Clydesdale

rig. To this keel were bolted the sternpost with its knee (and a now missing transom), the now missing stem, and a wide apron, all of live oak. Fourteen symmetrical live oak floor timbers are notched over and spiked to the keel and at least three more are notched over and spiked to the apron. The floors are clamped in place by a pine keelson bolted through every third or fourth frame and into the apron and stern knee.

A deep rabbet is worked in the side of the keel below its upper edge and into the sternpost, and after the floor timbers had been fastened in place the pine garboards and first three broad strakes were nailed to the rabbet and nailed and treenailed to the floor timbers. With the bottom strakes in place, live oak half-frames, which reached from the garboard nearly to the sheer, were inserted between the floor timbers, with clear space separating them both fore and aft, and nailed and treenailed to the bottom planking. The bilges and sides were then planked, and short live oak futtocks butted to the heads of the floor timbers were added. This sort of framing, in which none of the elements are fastened together, is a holdover from earlier methods and can be seen in other areas of North America, where it used well into the 19th century on quite large vessels, such as New Bedford whaling ships.

At some point the sides of the Clydesdale sloop were raised approximately 0.30 meters (1 ft) by the insertion of live oak top timbers between the half-frames and futtocks. These top timbers were inserted behind the ceiling, which is composed of single lengths of wide, yellow pine boards that have been carefully fitted and finished to provide a smooth interior surface to the hold. The ceiling was also caulked and the limber boards nailed down, indicating a deliberate attempt to make the hold watertight. This suggests that at some time the sloop was used for carrying rice, the primary agricultural product of the lower Savannah River. The deck remains consist of one whole lodging knee and fragments of at least two others, but it is not possible to say where the deck was located. Cuttings in the ceiling fore and aft suggest that there may have been a small fo'c'sle with a raised sole and a trunk cabin aft, but no definitive remains survive.

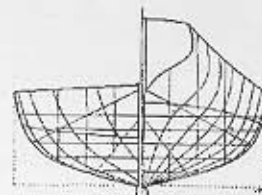
The shape of the hull is relatively sharp, with noticeable deadrise, a sharp, short entrance and a long, straight, fine run (Fig. 7). Wear of the after end of



CLYDESDALE PLANTATION VESSEL

Lines to Inside of Plank

Reconstructed Dimensions
Length Overall 13.34m
Maximum Beam 3.58m
Maximum Depth 1.75m



Drawing by F. M. Hooker

the keel indicates a fair amount of drag, and although the stem was removed before the vessel was buried, the remaining hood ends at the bow reveal a smoothly curving stem rabbet with a long rake. These qualities, along with the heavy keel, all suggest a fast, powerful sailing vessel with relatively little cargo capacity; if properly decked, the Clydesdale sloop would have been useful offshore. Vessels of similar shape but schooner rigged were used in other ports for pilot work, and the cuttings in the ceiling may suggest that a large part of this sloop's interior was given over to accommodation, which is also typical of a pilot vessel. As 18th-century customs records from Charleston and Savannah reveal, vessels of this size and rig were also being used for trade with Bermuda and the West Indies, as well as for coastal passages.⁷

Preliminary lines, to the inside of the plank, of the Clydesdale Plantation vessel.

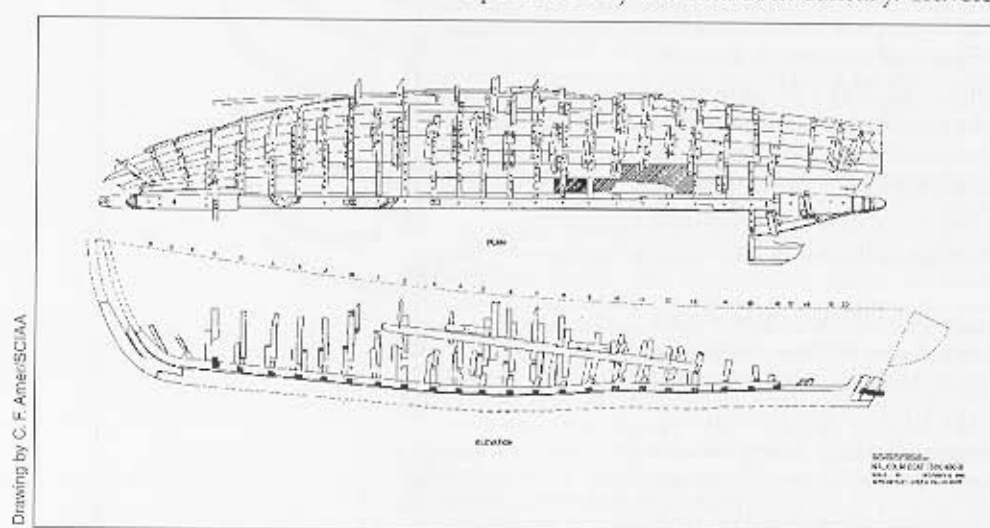
The Malcolm Boat was discovered in 1974 in the bank of the Ashley River near Charleston and excavated in 1992.⁸ Analysis of the context in which the craft was found reveals the boat was stripped and abandoned towards the end of the 18th century after a lengthy career. Study of the remains reveals a round hulled, keeled vessel with a transom stern. The reconstructed hull is 12.75 meters (41 ft. 10.25 in.) long and has a beam of approximately 3.58 meters (11 ft. 9.25 in.) and an estimated depth of hold of 1.50 meters (4 ft. 11 in.) A displacement of approximately 24 tons is suggested. The vessel had a fairly sharp entry below the waterline and was roomy above. It had a full bodied midsection that carried aft to the narrow transom. The construction features observed on the hull—numerous made or molded frames additional futtocks installed between frames and a keelson notched over and fastened to each frame—suggest a boat designed for strength and with the ability to carry heavy loads. A transom stern would have enhanced the vessel's cargo carrying capacity and seaworthiness for offshore voyages, and it appears to have been the stern of choice of colonial shipwrights in South Carolina. The hull would have had a graceful shape and was no doubt pleasing to the eye.

The hull was fashioned from woods locally available and abundant in South Carolina's coastal region.⁹ The live oak posts and mixed live oak and white oak frames were fastened to an 11.0 meter (35 ft. 11.625 in.) straight-grained keel of southern yellow pine; a skin of cypress and pine planks 0.025 to 0.03 meter (1 in. to 1.125 in.) in thickness completed the lower hull. Ceiling planks appear to have been reused and, like the sole beam found on the site, were of pine. Floor timbers and futtocks were approximately 0.08 meter (3.125) square while room and space varied from 0.36 to .046 meters (1 ft. 2.125 in to 1 ft. 6 in.). The midship beam, which describes the widest point of the hull, was

placed one-third of the vessel's length from the bow. A single rectangular mortise in the keelson, located at the midship beam, once supported the heel of a mast while a second mortise farther aft (and now partly plugged) suggests that the rig may have been altered during the career of the vessel. A single pump, set against the port side of the keelson in the stern, would have facilitated the removal of water which found its way into the hull. During its career, the Malcolm boat was extensively repaired and even underwent a refit to strengthen the hull and enhance its cargo carrying ability.

These three vessels, none of them very large, are a fairly representative sample of coastal and riverine sailing craft built in the Carolinas and Georgia during the 18th and early 19th centuries. Each is suited to a slightly different role and condition of navigation, from serving underdeveloped river plantations to offshore passage making, and each can be related to vessels described in the historical records. Flat-bottomed periaguas and similar craft were the workhorses of local transportation by the mid-18th century. Travelers in the colonial South describe

the slow, methodical progress of journeys made on these vessels and the sheltered waters in which they sailed. In contrast, coastal sloops and schooners of more conventional European build were primarily employed on longer passages between major populations centers and were expected to be more seaworthy, as well as faster. Of course, one paid a higher price for quicker travel from Charleston to Savannah, as travelers reported.¹⁰ By the 19th century the periagua type seems to have disappeared



Drawing by C. F. Amer/SCIAA

Site plan of the wooden remains of the Malcolm boat

from coastal commerce, replaced by small, open sloops such as the Malcolm boat at one end of the scale and plantation barges at the other. The changing nature of the waterways and port facilities made hybrid vessels such as the Brown's Ferry schooner obsolete, but more conventional fore-and-afters remained an important, if often overlooked, part of the maritime economy.

Although they are of different types and ages, the excavated vessels of the southeastern American coast do have a number of features in common. Whether these features can be said to define a distinct tradition is difficult to say, but they do point toward a certain consistency in design and construction. Not the least of these similarities is the preference for a very small number of wood species. Live oak (*Quercus virginiana*) was the wood of choice for curved structural timbers (frames, stems, knees), even before this timber was being exported to northern shipyards for the construction of seagoing ships. Long, straight components were normally cut from either cypress (*Taxodium distichum*) or yellow pine (*Pinus spp.*), both strong, durable woods. In all three vessels, softwood components are cut from long, broad logs; in the Brown's Ferry vessel, the bottom is made from planks over 14 meters (46 ft.) long and 0.47 meters (1 ft. 6 in.) wide, and even a half-century later, the ceiling and some of the exterior strakes in the Clydesdale vessel are made of single planks over 12 meters (39 ft. 3 in.) long. Exterior strakes on the Malcolm boat, despite the small size of the vessel, were still made up of planks from 6 to 10 meters (19 ft. 6 in. to 32 ft. 6 in.) in length.

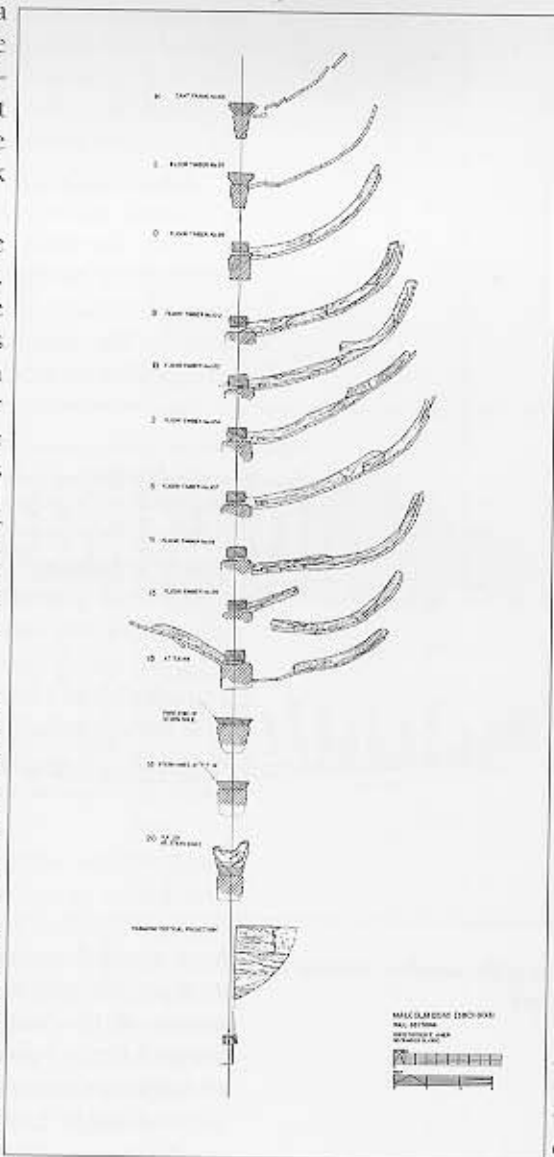
Another similarity is a strong preference for transom sterns; all of the excavated

craft in the Carolinas and Georgia, even quite small vessels, have produced clear evidence of transom sterns, and modern small craft traditions of bateaus, skiffs, and sharpies all retain this feature. In stark contrast to these Southern boats, transom-sterned merchant vessels of New England mix with a wide variety of double-ended fishing craft. This may reflect the differences in navigation conditions: the seakeeping abilities of the double-ender are less necessary in the somewhat calmer, more sheltered waters of the southern coast, and the shallow draft imposed by the rivers puts interior and deck space at a premium.

At the same time it may be possible to detect some chronological development in the excavated remains. Cypress only appears in large, structural timbers in the early period, with yellow pine predominating later. This change may be due to greater availability of cypress earlier in the colonial period, before coastal swamps were cleared for rice cultivation. Surveys of the Savannah River's foreshore show that the rice banks of the later 18th and 19th centuries are built over cypress stumps embedded in the original river bank. If the Brown's Ferry vessel is at all typical of its period, then there also appears to be a chronological development away from distinctive hybrid or specialized craft toward more conventional, ship-built boats for coasting.

During the 18th century many European shipwrights and artisans came to Charles Town from Europe, bringing with them their boatbuilding traditions and practices of construction. From the 1740s to the time of the Revolution, the four active Charles Town shipyards built many sloops and schooners in the 20-ton range, which were able to ply the coastal waters of the colonies and to enter into the West Indies trade. After 1760 many plantation owners in the Carolinas had their own vessels built that were capable of going beyond the colonial confines and conducting trade as far away as the Caribbean and South America.¹¹ The Malcolm boat and Clydesdale Plantation sloop are the earliest vessels studied in South Carolina that demonstrate this capability, although both would have been at the extreme lower end of the range of vessels suitable for such work. Many of the later sailing vessels of the Carolinas and Georgia, such as the Clydesdale, Malcolm, and Mepkin Abbey boats, would not look out of place in a Chesapeake or New England port.

The discovery of the Malcolm boat and Clydesdale Plantation sloop abandoned in these contexts is helping to confirm an emerging pattern: small craft were often disposed of in the many creeks and sloughs of the state's Low Country when their usefulness was at an end.¹² Many such craft remain to be discovered, and each year erosion along the rivers of the tidal lowlands exposes new and interesting remains. These remains are the last traces of a once vigorous merchant coasting fleet. Studying them in detail should help fill in the gaps in our knowledge of the history of southern boatbuilding.



Hull sections of the surviving starboard structure of the Malcolm boat.

Drawing by C. F. Amar/SCIAA

Sources:

1. Paul Lipke, Peter Spectre, and Benjamin A. G. Fuller, eds., *Boats: A Manual for Their Documentation* (Nashville: Museum Small Craft Association and American Association for State and Local History, 1993) 303-315.
2. In addition to the Malcolm and Clydesdale Plantation vessels discussed below, a large sloop has been investigated at Rose Hill, North Carolina, by the North Carolina Department of Natural Resources, Underwater Archaeology Division; however, this vessel is thought to be of northern origin, as were many of the larger sloops and schooners trading in the colonial Carolinas.
3. In addition to the Brown's Ferry vessel, discussed below, likely schooner remains investigated in South Carolina include the Little Landing wreck 2 (38BK861) [see Christopher F. Amer and Bruce Thompson, "The Little Landing Survey," ms., South Carolina Institute of Archaeology and Anthropology, 1989]; the Biggin Creek vessel [see Christopher Amer, "The Biggin Creek Vessel (38BK887)," in *The Santee Canal Sanctuary, Part I*, ed. Joe J. Simmons and Mark M. Newell, (Columbia: South Carolina Institute of Archaeology and Anthropology, 1989)]; a small transom-sterned boat (38BK102) found during excavation of the Santee Canal [see Mark M. Newell, *The Santee Canal Sanctuary Part II, Preliminary Archaeological Investigations of the Hobcaw Creek Vessel located in Hobcaw Creek, Charleston, South Carolina, Cultural Resource Management Publication No. 6*, South Carolina Institute of Archaeology and Anthropology, University of South Carolina, Columbia, 1989]; the Hobcaw Plantation vessel (38CH1289) [see David V. Beard, Reconnaissance Survey Report: Preliminary Archaeological Investigation of the Hobcaw Creek, Charleston, South Carolina, Cultural Resource Management Publication N. 11, South Carolina Institute of Archaeology and Anthropology, Columbia, 1991]; the Mepkin Abbey Wreck (38BK48) [see "An Early 19th Century River Trading Vessel," in *Underwater Archaeology: The Challenge Before Us*, The Proceedings of the Twelfth Conference on Underwater Archaeology, Gordon Watts, ed., Fathom Eight Special Publication Number 2, San Marino, California, 1981]; and the Pimlico wreck (38BK1614) [see Lynn B. Harris et al., "The Cooper River Survey: An Underwater Reconnaissance of the West Branch," Research Manuscript Series Number 217, South Carolina Institute of Archaeology and Anthropology, Columbia, 1993].
4. Donald H. Keith and Toni L. Carrell, eds., "The Hunting Island Vessel: Preliminary Excavation of a Nineteenth-Century Fishing Boat," *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference* (Tucson: Society for Historical Archaeology, 1992).
5. Alan B. Albright and J. Richard Steffy, "The Brown's Ferry Vessel, South Carolina: Preliminary Report," *International Journal of Nautical Archaeology and Underwater Exploration* 8:2 (1979): 121-142 and Frederick M. Hocker, "The Brown's Ferry Vessel: An Interim Hull Report," *Underwater Archaeology Proceedings*, eds. Donald H. Keith and Toni L. Carrells (Tucson: Society for Historical Archaeology, 1992): 20-25. The vessel was excavated in 1976 by the South Carolina Institute of Archaeology and Anthropology under the direction of Alan Albright, and the remains were conserved in a purpose-built facility in Columbus. Conservation was completed in 1991, and the vessel was transferred to Georgetown, South Carolina, where it will be reassembled and exhibited in the Rice Museum.
6. Frederick M. Hocker, "The Clydesdale Plantation Vessel Project: 1992 Field Report," *Institute of Nautical Archaeology Quarterly* 19.4 (1992): 12-16. The vessel was discovered in 1991 during a Section 106 (NHPA) survey by Tidewater Atlantic Research, Inc., and excavated in 1992 in a joint project by the Institute of Nautical Archaeology, Texas A&M University, South Carolina Institute of Archaeology and Anthropology, and the Coastal Heritage Society of Savannah, Georgia, under the direction of Fred Hocker. The remains were reburied on site and stabilized with commercial erosion-control and bulkheading.
7. Public Record Office, C.O. 5, nos. 648-712, which include custom records for the ports of Charleston and Savannah for several years up to the end of the Revolution; these records are presented in distilled, tabular form in Joseph A. Goldburg, *Shipbuilding in Colonial America* (Charlottesville: U of Virginia Press, 1976) 232-245.
8. Christopher F. Amer, et al., "The Malcolm Boat (38CH803): Discovery, Stabilization, Excavation, and Preservation of an Historic Sea Going Small Craft in the Ashley River, Charleston County, South Carolina," *Research Manuscript Series Number 217*, (Columbia: South Carolina Institute of Archaeology and Anthropology, 1993). As at the site of the Clydesdale Plantation sloop, only a few timbers from the stern of the vessel were visible through the mud when Mr. James Malcolm, who had discovered the vessel while hunting for shark's teeth, reported the find to underwater archaeologists at the South Carolina Institute of Archaeology and Anthropology. Rapid erosion caused by waves from passing powerboats threatened the site, which was stabilized and assessed for significance. In 1992, the Underwater Archaeology Division of the South Carolina Institute of Archaeology and Anthropology, under the direction of Christopher F. Amer and supported by a matching grant from the South Carolina Department of Archives and History, conducted a partial excavation of the craft. After the excavation remains has been recorded, the site was reburied and stabilized with mud, sand, sandbags and Geoweb confinement fabric.
9. For a description of the flora of the region, see Charles F. Kovacik and John J. Winberry, *South Carolina: The Making of a Landscape* (Columbia: U of South Carolina Press, 1989) 45-56.
10. For example, in *A Journal of the Proceedings in Georgia* (Meadows, London, 1742) 2-3, William Stephens describes his deliberations over whether to hire a pettauger or schooner to take him to Savannah from Charleston in the fall of 1737.
11. See P. C. Coker III, *Charleston's Maritime Heritage, 1670-1865* (Charleston: Coker Craft Press, 1987) 47-49.
12. Amer, "The Biggin Creek Vessel" (supra n. 3); Beard (supra n.3); William R. Judd, "The Biggin Creek Flatboat," in *The Santee Canal Sanctuary, Part I*, ed. Joe J. Simmons and Mark M. Newell, (Columbia: South Carolina Institute of Archaeology and Anthropology, 1989: 81-84; Mark M. Newell, "The Historic Working Small Craft of South Carolina: A General Typology with a Study of Adaptation of Flatboat Design," diss., Scottish Institute of Maritime Studies, St. Andrews University, 1992, 136-137.