With some knowledge of the route’s geography, Thomas Jefferson and his secretary Meriwether Lewis planned a discovery expedition across the American continent, hoping to find a short portage from the Columbia River to the Missouri. That search would serve as one of the most important goals of the expedition: to find a water transportation route to the west coast. As such, the navigability of the rivers was critical to Jefferson. There was also a considerable amount of material that needed to go on the trip, from supplies to gifts for the Plains Indians. With this in mind, Lewis drew up a list of requirements for equipment and supplies to be used on the expedition. One of the items was a “keeled boat light strong at least 60 feet in length her burthen equal to 8 tons.”

**LEWIS & CLARK’S BOAT:**

**BARGING**

By David Purdy
Detail of Barge on the Mississippi, Félix Achielle St. Aulaire, 1832, hand-colored lithograph.
Saint Louis Art Museum, Museum Purchase 262.1930.
he custom of the time was to appoint someone local, either a politician or a government official, to supervise a project such as building a boat. Accordingly, in April 1803, Lewis sent a letter with a description of the vessel he wanted to William Dickson, U.S. Representative from Tennessee, in order to have the boat built in Nashville. The record is not completely clear, but by June 1803, Lewis realized that the boat could not be built there, and he shifted his attention to Pittsburgh. Where his boat was built and by whom remains a source of debate. This article attempts to shed light on what type of boat was built for Lewis and Clark in Western Pennsylvania.

In the early 19th century, Pittsburgh and vicinity had an active ship- and boatbuilding industry. Eight boatyards in the region produced an estimated $40,000 worth of boats per year in 1802. In the year Lewis’ boat was built, several vessels, including a brig and a schooner, left Pittsburgh for such places as Liverpool and the Caribbean. In addition to these projects, the Pittsburgh yards busily built barges, bateaux, flatboats, log canoes, pirogues, and skiffs. While not a major world shipbuilding center, the Pittsburgh yards were certainly capable of building complex watercraft.

When Lewis arrived in Pittsburgh on July 15, 1803, he expected to find his boat almost ready for service. The promised date of completion had been July 20. The boat builder, however, complained that he was unable to procure proper timber. As Lewis waited impatiently, he found that the builder was frequently drunk, and when he was drunk, his men did not work. Meanwhile, the level of water in the Ohio River continued to fall, and Lewis was increasingly apprehensive about his ability to travel downriver. Finally, with his boat completed on July 30, Lewis quickly departed for St. Louis with a crew of 11—seven soldiers, three candidates for the expedition crew, and a pilot. As Lewis predicted, the passage as far as Wheeling was difficult due to low water, lower than had been seen for the previous four years. Several times the crew had to shovel through sand bars, and oxen or horses had to pull the boat over shallow spots. This was apparently common since locals with teams stood ready to provide the animal power. Lewis complained that the owners of the teams took advantage of him and charged exorbitantly. Lewis bought a pirogue (a dugout boat) to provide additional capacity. The idea was to lighten the big boat. Unfortunately the pirogue leaked, so goods had to be shifted between boats. It was fortunate that the weather was warm (63° F at one time) and the water was warmer (75° F), but this combination resulted in fog, which even in better circumstances would have made travel difficult. At one point, the wind sprang up from a favorable direction, and the foresail was put up. The sprit carrying Clark had been active in the Ohio River Valley since the early 1790s as an army officer and land developer so he was familiar with boats and their application on Western rivers and took advantage of the winter to modify the expedition vessel.
it broke, so they put up the main sail too, but its sprit also broke.6

Since both a foresail and a mainsail are mentioned in Lewis’ journal, it is apparent that the boat had two masts at this time. This view is confirmed by two informal representations of the boat in 1803.7 At this stage, it was probably an open boat with a foredeck, cabin aft, and two masts.

On October 15, William Clark joined the expedition at Clarksville, Indiana Territory, just across the Ohio River from Louisville, Kentucky. The crew paused here while Clark got acquainted with plans for the journey and while recruits for the expedition were selected, mostly from among young soldiers and experienced backwoodsmen. They continued down the Ohio, reaching its mouth on November 10, then traveled upstream on the Mississippi without major difficulty. The boat suffered one casualty on this leg of the trip—one of its masts broke—but arrived in St. Louis on December 11.8

The boat was moored in a small tributary on the east side of the Mississippi—Wood River—located across from the mouth of the Missouri. It was initially afloat, but as the river fell during the winter, it was supported on “pries,” to use Clark’s term. (The journals do not explain, but pries seem to be wedges or props.)9 Expedition members built and occupied huts nearby. Lewis spent most of the winter in St. Louis, while Clark stayed on the boat at Wood River.

Clark had been active in the Ohio River Valley since the early 1790s as an army officer and land developer so he was familiar with boats and their application on Western rivers and took advantage of the winter to modify the expedition vessel. One mast was removed and the remaining one adapted so that it could be pivoted down. The rig became one square sail. Lockers were installed along the bulwarks for storage and protection. (See Figure 1, from Clark’s field notes.) The boat was now in the configuration used by most modern replicas. (See, for example, Figure 3.)

They set forth on May 14, 1804, with Clark and 20 members of the expedition on board. The barge and two pirogues were bound for the Mandan Indian towns on the Missouri River in present-day North Dakota.10 Lewis rejoined them on May 20.11

The Missouri was a difficult river to navigate. Fast, wild, and meandering, its banks often caved in, making camping near it dangerous. It was also studded with snags.
(trees) stuck in the riverbed, which were sometimes difficult to see. A special form of snag, called a sawyer, could oscillate up and down and threaten to come up beneath a boat. On several occasions, the boat did hit obstacles and wheel around several times. During a violent storm it was saved from capsizing by the crew’s prompt action and the locker tops, which kept water out of the boat.12

The boat was propelled upriver by whatever means worked at that moment. If the wind was favorable, the sail was used. More commonly, if the river was shallow enough and the bottom firm, it was poled. If the bank was stable, the men on shore could tow or “cordelle” the boat. In extreme cases, the boat was warped—a long rope was tied to an object on shore, a tree for instance, and then the men in the boat pulled it upstream. The boat could also be rowed but this seems to have been done rarely. Progress was slow, and labor was brutal.

By November 1804, the expedition reached the Mandan towns, and it became obvious that they would have to stop again for the winter. The party built winter quarters at a site with timber. Ice covered the river progressively and finally closed it completely. The boat remained iced in until January 1805, when efforts were made to free it. Finally, in late February, it was cut loose, dragged ashore, and placed next to the winter quarters.13

The expedition plan called for one boat to return to St. Louis, carrying scientific specimens, data, and reports. In September 1804, it was intended that one of the pirogues would be so used. The plan was changed, however, and it was decided that the return trip would be delayed until spring and the big boat would make the voyage. The reasons for these changes are not explicitly stated, but the delay permitted better planning for the boat’s return. Perhaps, too, Lewis and Clark may have
realized that the big boat was too awkward to continue on the shallow upper river.

The boat was put back in the water in early April and started downriver while the expedition traveled upriver on its way to the Pacific Ocean. With its arrival in St. Louis, the nameless barge had completed its service to the expedition.\(^\text{14}\)

**Facts about the Boat**

The facts we know about the boat are limited. The most reliable and comprehensive information extant on the Lewis and Clark boat is a drawing in Clark’s field notes made during the winter of 1803–04. It shows an outboard profile and plan view of the vessel, both drawn freehand. One might suspect the accuracy of this sketch, since it was made without the benefit of drawing instruments. However, other Clark boat drawings, such as those for a Spanish galley and for a flatboat, demonstrate that he was a careful drafts person. The sketch also gives the length of the cabin as 14 feet and the length in hold as 31 feet. The beam is given as 8 feet 4 inches. Twenty oar positions are shown.\(^\text{15}\)

Evidence indicates that the boat had two masts when it left Pittsburgh. Incidents implying two masts are described in the journals. Also, details on two maps prepared by Clark in 1803 show a boat with a cabin, aft, and two masts. It is probable, but not proven, that the details are intended to represent the expedition’s boat.

Since the drawing in Clark’s notes shows the boat as it was after his modifications in the winter of 1803–04, it is apparent that Clark had one mast removed. Two masts were the normal, but not universal, practice on the east coast for a boat as narrow and shallow in proportion to the length of this one. Extant examples of Mississippi River system practice, on the other hand, show only one mast.\(^\text{16}\)

The official report of the expedition, published in 1814, says that the boat was 55 feet long, drew 3 feet of water, and had 22 oars. It also says that the foredeck was 10 feet long. This length data in the introduction is then consistent with the length data in Clark’s notes, assuming that “length” is meant length on deck. Unfortunately, the introduction says the cabin was also 10 feet long, which introduces a discrepancy with the drawing.\(^\text{17}\)

Several replicas of Lewis and Clark’s boat have been built in recent years, based largely on the above information. Two schools of thought on the actual shape of the boat have developed. One says that the boat was flat bottomed. The other says that a more rounded hull was used. Clark’s sketch does not suggest which is correct. For further indications of the boat’s shape, one must examine contemporary descriptions. The official report of the expedition, published in 1814, refers to the boat as a “keelboat.” Lewis also used the term “keeled boat” to refer to the craft.

Keelboats were developed on the American frontier. They appear in literature about the time of the Revolutionary War, and were popular on the Ohio and Mississippi rivers in the 1800s. Keelboats were round-bottomed, double-ended boats, meaning that they were pointed at both bow and stern.

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Figure 4: Plans for a galley, 1799 as seen in *The 32 Gun Frigate Essex*, 1990. Courtesy of author.
If the Boat wasn’t a Keelboat, What was It?

Clues about the type of boat can be derived—to a degree—from the words used by people involved in the expedition to describe it. Several people called it a barge, while others referred to it as a “bateau,” the French word for boat.

On the frontier, bateau was used to designate a flat-bottomed, double-ended boat steered with a sweep. Known examples of bateaux are open boats.20 It is apparent that Lewis and Clark’s boat was not a bateau, even though three members of the expedition used that term for the boat on the same day.

In the mid- to late 1700s, a barge meant a rowing vessel with a cabin for important personages. George Washington used “a

They had a strong sheer and sharp raked ends, and were steered with a sweep. Both the stem and the stern posts were greatly slanted. The result was an easily constructed hull, all convex surfaces, and minimum twist to the planking. This type of hull was streamlined and easy to propel. (See Figure 2 for two keelboats.) Because of this, keelboats became the standard type of cargo or passenger boat on Western waters.18

The keelboat seems to have developed from the “dorem” used on the Mohawk River. Dorems did not have keels, since a keel would have increased the vessel’s draft—an important consideration on the shallow Mohawk River and Frenchmen’s Creek. Instead of a keel, the dorem’s ribs were set directly on the center plank.19 Yet to cope with obstacles on the Ohio and Mississippi rivers, such as rocks and snags, a keel was deemed necessary and the ribs were fastened to it. Thus was the “keelboat” born.

Although Lewis called the expedition vessel a “keeled boat,” it is not clear what he meant by this. In his order for the boat, he might have been trying to convey that he needed a boat with a keel, as distinguished from a flatboat or a bateau. It does not appear, however, that Lewis and Clark’s boat could fairly be described as a keelboat. It had a transom and a flat sheer, and it was steered by a rudder. In the plan view of Clark’s drawing, the shape of the boat’s stern is not compatible with a keelboat because it does not come to a point. Instead, it is squared off at the deck level to accept the cabin. Also, the stern post is nearly vertical to provide for the rudder, rather than angled like a keelboat’s.

Figure 5: Similar to, but larger than the Lewis & Clark boat, was the Wasaorden, the Swedish state barge built in 1775. Courtesy of author.
magnificent 45’ barge rowed by 13 Harbor Pilots dressed in white” for the final leg of his trip to New York for his inauguration as President in 1789. General James Wilkinson, Commander of United States forces in the West, had a barge built for his use on the Ohio in 1792. William Clark, then a lieutenant in the U.S. Army, used one when he visited Spanish authorities at New Madrid on the Mississippi in 1796.

Eventually, American barges became cargo vessels. Responding to the conditions of American waterways, the use of oars was reduced and gangways were provided for poling. Sails were also used. (See Figure 3 for an example of a large cargo barge.) Smaller barges and keelboats were employed in fur trade expeditions up the Missouri River in the first and second decades of the 19th century.

Given what evidence is available, it seems probable that Lewis and Clark’s boat was a barge. Barges were common at the time and used for purposes similar to those of Lewis and Clark’s expedition. Thomas Rodney, who saw the boat at Wheeling on September 8, 1803, termed it a barge, as did Pierre Chouteau, manager of a prominent fur trade company in St. Louis when it arrived in that city in May 1804. Even Lewis called it a barge by the end of the expedition. Clark’s sketch is also consistent with a barge. Indications seem to be that Lewis and Clark’s vessel had a form broadly similar to that of known barges, including a rounded hull with a transom. Unlike a bateau, there would have been no chine (spine). Unlike a keelboat, there would have been a transom.

Another type of boat that might have influenced Lewis and Clark’s is the galley, as built and employed on the Ohio and Mississippi rivers. (An example of about the
same length is shown in Figure 4.) A John Taylor built two boats to these plans in Pittsburgh in 1799. The galleys are beamier, deeper, and probably fuller bodied than Lewis and Clark’s boat, but like Lewis and Clark’s, both of these galleys had two masts. Since the galleys were built to U.S. government specifications, there is probably a relationship between their specifications and those of the Lewis and Clark boat.

Assumptions about Lewis and Clark’s vessel can also be checked by comparing it to others of the same period. One example is the Swedish state barge, the *Wasaorden*, built in 1775. (Figure 5.) This boat was slightly bigger than Lewis and Clark’s boat and slightly longer (56.5 feet vs. 55 feet) and wider (10 feet vs. 8 feet). It had almost the same number of oars (18 vs. 20). The cabin of the Swedish boat was placed further forward of the stern to allow room for a helmsman at deck level and to provide a convenient place for eminent guests to board the vessel. Like the Lewis and Clark boat, the hull width at deck level was nearly constant in way of the rowing space. This feature, common in large rowing craft, provides a nearly-constant ergonomic condition for all the rowers. The stern was square at deck level on both boats. At waterline level, the Swedish vessel was pointed at both ends to make the hull easier to row.

A final example from that time period is the barge carried on the U.S. frigate *Essex*, built in 1799. (Figure 6.) This barge is smaller (30 feet long) than the Swedish barge or Lewis and Clark’s with only 10 rowing positions and no cabin—presumably because a cabin would have been awkward for a boat carried on a ship. Passengers would have been carried in the open at the stern. Like the Swedish barge, the hull width is nearly constant over much of the length at deck level, while the hull is pointed, bow and stern, at the waterline and below.

It can be inferred from the similarities in design that the hull form for the Lewis and Clark boat was similar to the two examples above. The Lewis and Clark barge was deeper than either of the other two to provide more room for cargo.

Instead of a primitive boat built in a near wilderness, the research indicates that Lewis and Clark’s boat was sophisticated, in contemporary terms, being built in a well-developed shipbuilding center. The records and a comparison of William Clark’s drawing with plans for contemporary barges show much commonality. Construction of the boat by the anonymous drunken builder, supervision by Meriwether Lewis, and modifications made by William Clark at Wood River resulted in a craft well-adapted to carrying the expedition on the first successful phase of its voyage westward.

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5 Letter, Lewis to Jefferson September 8, 1803, Document 86 in Jackson.
8 Journals, December 11, 1803.
9 Journals, December 22, 1803.
10 Journals, May 14, 1804.
11 Journals, May 20, 1804.
12 Journals, July 14, 1804.
13 Journals, February 26, 1805.
14 Journals, April 7, 1805.
16 Manuscript Drawings in Clark Papers, Missouri Historical Society.
18 Leland Baldwin, The Keelboat Age (Pittsburgh: University of Pittsburgh Press, 1941), especially pp. 43-45, 64, 138-139.
23 Unsigned manuscript report to Major General Wayne in Clark Collection, Missouri Historical Society.
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