



The Waterfront Museum Education Packet

I. Introduction

Built in 1914, Lehigh Valley Railroad Barge #79 (LHV # 79) is listed on the National Register of Historic Places as the only surviving example of wooden railroad lighterage. LHV #79 once stowed and carried rice, coffee, sugar, flour, and spices to and from railroads and larger vessels for passage across the Atlantic during the height of the Port of New York's maritime trade activity, 1910-1960. It is moored at Pier 44 off Conover Street on the Red Hook, Brooklyn waterfront.

Stepping onto the dark red barge, students imagine captains, stevedores and mates busy with the storage and delivery of merchandise. They envision a once active port, filled with railroad carfloats transporting freight, tugboats loudly blowing steam whistles, and brick warehouses, amidst waterfront terminals, stocked with cargo and teeming with longshoremen, woodworkers, and engineers.

II. How to Use the Lesson

The Waterfront Museum Education Packet complements a field trip to LHV #79. Before visiting the barge, students should become familiar with its history, as well as that of the Port of New York and the lighterage system. The packet's readings (some may have to be modified for reading levels), visuals, and activities provide background on these topics, with additional resources to help students and teachers locate other relevant materials. The packet's contents address social studies standards for American and New York history and geography, and are best suited for students in grades 6-8, though activities and readings can be adapted to younger ages.

Objectives

Students will:

- Chart the development of the Port of New York
- Describe the role of the lighterage system during New York's maritime trade
- Identify and illustrate cargo vessels in New York harbor
- Explain and recreate the roles of lighterage personages

Visiting the Site

The Waterfront Museum is located at 290 Conover Street, Brooklyn, NY, 11231. Click onto the museum's web address for the best directions to the site, or contact David Sharps preferably by email at dsharps@waterfrontmuseum.org or (718) 624-4719.

III. Setting the Stage

Explain to students that between 1910 and 1960, New York and New Jersey made up one of the world's leading ports. As cargo and immigrants sailed in from the Atlantic on ocean liners, barges and lighters transported freight across the harbor. People crossed the river on ferries to connect with thirteen different railroad lines on the New Jersey side of the Hudson. New York harbor's geography dictated the placement of railroad terminal facilities on the New Jersey shoreline. Because of the lack of bridges and tunnels, goods to be consumed in New York City and cargo to be transported for shipment overseas first had to be transported by water within the harbor. The lighterage system was developed for this purpose. The term lighter originally referred to vessels used to lighten the load of ships attempting to dock in shallow waters.

IV. Barge Background

Activity 1: Show students a picture of LHV #79 and its location on a map of New York City and/or Brooklyn. Explain that the barge is a historic reminder of the lighterage system—the use of barges to deliver freight from railroads for delivery to New Jersey ports and those overseas—and of prime importance to the New York harbor when maritime trade was at its peak. Distribute and direct students to read “The History of Lehigh Valley Railroad Barge # 79” (Reading A). Divide students into groups of museum docents who provide an overview of the barge to international tourists.

Activity 2: Distribute and direct students to read “The History of Lehigh Valley Railroad Barge #79” (Reading A). In small groups, have students summarize the barge's history, purpose, structure, and current use, and discuss why the barge has historic importance. Ask students to draw their version of the barge and then present their drawings and group summaries to the class.

V. Student Readings

A. The History of Lehigh Valley Railroad Barge #79

The Lehigh Valley Railroad Barge #79 (LHV #79) was built in 1914 at New Jersey's Perth Amboy Drydock Company for the Lehigh Valley Railroad. It is an example of the generation of covered barge (also called a lighter or house barge) that transported perishable goods, or those that could not be exposed to weather conditions. It was the most numerous type of craft in the railroad navies in New York during the first half of the 20th century.

LHV #79 has a hull with a flat bottom, vertical sides, and a bow and stern “rake” angled at about 45 degrees. Its deckhouse has slightly angled sides, square ends, and a cambered (arched) roof. There are two cargo doors on either side, with corresponding hatches cut into the roof to allow vertical hoisting of freight. The decks are short at both bow and stern, and there are very narrow ledges at either side.

LHV #79 stowed cargo on the main deck. Its deckhouse is eleven feet, seven inches at the center, and eleven feet one inch at the sides. The walls are relatively light in construction with five inch wide, three quarter inch tongue and groove boards laid horizontally over four-inch by four-inch studs. These are standard features associated with covered barges built after the 1890s.

The cabin that provided living quarters for the barge captain is located at the aft end of the deckhouse. (It was originally located on roof.) Remaining cabin furnishings are a table, a stool, a closet, a berth and mattress, and a shelf. The cabin has a single door on the port side, two windows in the aft bulkhead opening on the outside, and one in the forward bulkhead, opening into the main cargo space. There is galvanized iron on the center of the forward bulkhead and a fitting for a smokestack in the ceiling above; these suggest where the stove was originally located. The barge exterior was painted a dark red-brown with the identifying number 79 painted white. NO SMOKING and SAFETY FIRST are stenciled in white letters on interior bulkheads, cargo battens, and roof supports.

LHV #79 was discovered in 1986 in Edgewater, New Jersey by David Sharps, a professional juggler and entertainer who got hooked on maritime life while working on cruise ships in the early 1980s. When he returned to New York in 1987, after studying movement and theatre in Paris, where he lived on the Seine, he met others who lived on tugs and barges in the informal New Jersey boatyards and barge graveyards. Some of them felt that the culture of the waterfront was worth preserving and that a “Hudson Waterfront Museum” might be a vehicle for this. LHV #79 served this purpose. David bought the barge from a pile driver company, and began the process of getting it to float.

After several years of pumping 300 tons of muck out of the barge, and many hours of carpentry, the vessel became a museum. David and his colleagues restored the barge’s exterior. The spacious interior is used as a performance and exhibition space.

For several years, the barge roamed about, often resting at Liberty Park in New Jersey, which had been its previous home until the 1960s. Since 1994, the barge has been tied up on Red Hook’s waterfront, in the midst of a few remaining 19th Century masonry warehouses at the port.

Excerpted and adapted from:

The Lighterage System in the New York/New Jersey Harbor. A publication of The Hudson Waterfront Museum, in conjunction with the Exhibit on the Lehigh Valley Covered Barge, #79. Liberty State Park, Jersey City, New Jersey. July, 1992. pp. 14-15.

“The Railroad Navy at the Port of New York, Part III: The Covered Barge.” *Transfer* No. 22, September-December 1997. Rail-Marine Information Group. pp. 11-21.

Discussion Questions

1. When was the Lehigh Valley Railroad Barge #79 built? Where is it located?
2. What did the LHV #79 carry? Who do you think received these goods?
3. What is important about the LHV #79? What does it tell us about the past?
4. What are some of the physical pieces of the barge? In what ways do you think these structures were important to the barge’s work?
5. Do you think this type of barge would be used again in the port? Why or why not?

Vocabulary

aft, arched, barge, battens, bow, bulkhead, cambered, cargo, deckhouse, freight, galvanized iron, hatches, hoist, hull, masonry, muck, rake, railroad navy, stern, smokestack

B. New York’s Growth into Maritime Trade

Native Americans used Manhattan as an entrepot for a trading network, reaching north along the coast to the Canadian Maritime Provinces, and south to the Chesapeake. The Dutch came first to trade with the established Native American cultures. New York became the first seaport with European and native craft coming and going, ten years before there was any established settlement ashore.

Native Americans and Europeans traded freely in the young Dutch settlement on Manhattan Island when the town was officially two years old. But conflicts arose, exacerbated as settlers from New England began to take Indian land for farming in Brooklyn and up the Hudson.

By the mid-1600s, New York was a thriving metropolitan community. By 1697, the British had taken over this bustling international seaport. The British built on Dutch foundations, using New York as a base for the wars that cleared the French from Canada and moved the frontier ever westward. Boston and Philadelphia, with their farming hinterlands, had much larger populations. But New York was by far the most diverse and contentious.

All this seafaring activity was based on the Royal Navy’s dominance at sea... The brothers Howe brought into New York Harbor the largest invasion force ever sent overseas. With this force, they forced Washington’s army out of New York... Despite a September 11th, 1776 meeting among Admiral Howe, John Adams, Benjamin Franklin,

and Samuel Rutledge to consider ways to end the rebellion, the war went on until British forces gave up and left in December 1783, leaving George Washington's army to re-occupy a burnt-out city.

Within weeks of the British departure, the city sent out the first ship to go to China under the American flag. When the Constitution was adopted, George Washington was inaugurated here as our first president. Freed of British colonial restrictions and challenged by a new sense of mission, New York grew prosperous on seaborne trade. By 1800, the city had overtaken Philadelphia and Boston as the nation's premier port... For New York, the War of 1812 was an interruption of its commerce, but the fortunes made by privateersmen fueled a tremendous postwar boom changed New York and the face of America.

The James Monroe--the first of what was called "packet ships"--sailed on January 5th, 1818 to open a new era in Atlantic travel... The wealth generated by shipping financed the digging of the Erie Canal, a tremendous capital undertaking that, from 1825 on, had a great effect on the city's growing economic base... The water link to the lakes made Chicago an outpost of that economy. New York rose to dominance in Atlantic trades. From the War of 1812 to the Civil War, the port handled 60 percent of all American East Coast trade...

Cunard opened regular transatlantic service on the news steamers in 1840 between Liverpool and Boston. However, within a few years, New York drew Cunard to its port. Designers improved the efficiency of steam liners and by 1851; American Collins liners crossed the Atlantic in ten days. These swift steamers took the cream of the carrying trade, but a rising tide of immigrants continued to come in by sail, providing business for the still-active packet ships.

New York's bustling harbor served more than just the great packet ships and steamers. The city's population increased through the 19th Century. The Revolutionary War had left the city with a population of 10,000. By 1850, that number had grown to 515,000. Ten years later, it reached 800,000. To serve this population, New York's spacious harbor was home, host, and highway for an almost infinite variety of vessels. The survival of the vast numbers of people flowing into the city depended on the grain brought in on Erie Canal barges from the mid-western states, and produce coming from Connecticut, New Jersey, and Long Island farms in river schooners and sloops...

The Civil War (1861-1865) brought draft riots and deep distress to New York. But America emerged from the all-consuming conflict as an industrial nation. The merchant marine was destroyed in the war, and after the war, New York's energies turned inland to railroad building and serving internal markets. Sailing ships built and owned in Maine were still on South Street, but the main action was in foreign steamers berthing on the North River or Hudson Shore... The liners also carried immigrants...

America's Entry into World War I in 1917 tipped the balance in a devastating conflict, but led to an uneasy peace. Liners kept sailing, sailing ships dwindled away, airplanes

arrived on the scene. Depression followed the 1920s. President Wilson had been defeated in the U.S. Senate in his effort to keep the U.S. in the League of Nations; collective security broke down and renewed European war broke out, becoming worldwide after the entry of the U.S. in 1941 (World War II). The main effort was to contain and then smash Nazi, Germany, first by keeping Great Britain (and later Russia) in the war, then by going over to the offensive with an Anglo-American army. New York was the gateway for this effort—the result was the Battle of the Atlantic, which changed the fate of sailors returning to New York after the war.

During World War II, New York harbor was divided into six hundred individual ship anchorages able to accommodate ocean-going vessels awaiting berthing or already loaded and awaiting convoy assignment and sortie. On the peak day in March 1943, there were a total of 543 merchant ships at anchor in New York harbor, a figure very close to maximum capacity.

The Port of New York was really eleven ports in one. It boasted a developed shoreline of over 650 miles comprising the waterfronts of Manhattan, Brooklyn, Queens, the Bronx, and Staten Island as well as the New Jersey shoreline from Perth Amboy to Elizabeth, Bayonne, Newark, Jersey City, Hoboken and Weehawken.

The Port of New York included some 1,800 docks, piers, and wharves of every conceivable size, condition, and state of repair. Some 750 were classified as "active" and 200 were able to berth 425 ocean-going vessels simultaneously in addition to the 600 able to anchor in the harbor. These docks and piers gave access to 1,100 warehouses containing some 41 million square feet of enclosed storage space.

In addition, the Port of New York had thirty-nine active shipyards, not including the huge New York Naval Shipyard on the Brooklyn side of the East River. These facilities included nine big ship repair yards, thirty-six large dry-docks, twenty-five small shipyards, thirty-three locomotive and gantry cranes of fifty ton lift capacity or greater, five floating derricks, and more than one hundred tractor cranes. Over 575 tugboats worked the Port of New York.

Between Pearl Harbor and VJ-Day, more than three million troops and their equipment and over 63 million tons of additional supplies and materials were shipped overseas through the Port of New York.

Trucks working on a new national highway system replaced much coastal traffic by sea. The jet airliner replaced the ocean liner in the passenger trade. And very large, fast ships carried cargo in containers demanding huge parking areas, which were developed in new seaports in the Jersey marshes and Staten Island. By the 1960s, most commercial traffic had left Manhattan and the traditional seaport district was in danger of being wiped out and forgotten.

Excerpted and adapted from:

New York is a Tall Ship: Showing how New York Grew to Greatness on Maritime Trade and what New Yorkers Learned Along the Way.

Meany Jr., Joseph F. *Port in a Storm: The Port of New York in World War II*. New York State Historical Society. 1992-present.
<http://www.nysm.nysed.gov/hisportofnewyork.html>

Discussion Questions

1. Describe the beginnings of seaport trade in New York.
2. What role did the seaport play for the British? What occurred between the British and America? How did this affect New York's trade and port activity? After the British left New York, what happened to the port?
3. What type of sailing vessel boosted the harbor's activity? What was the result of the result in the growth of the shipping industry?
4. What role did steamers have in trade activity?
5. What products did railroads and barges carry that were useful to New Yorkers?
6. After the Civil War, what did New York begin to build? What types of sailing vessels were most popular?
7. What happened to the ports after the World Wars I and II?
8. Describe the port as it was during World War II.
9. Discuss what you think is happening to New York ports and waterfronts now.

Vocabulary

anchorage, boom, capital, coastal, consuming, contentious, convoy, dominance, entrepot, exacerbated, hinterlands, maritime, outpost, postwar, rebellion, schooner, seafaring, sloop, sortie, spacious, thriving, transatlantic, undertaking, vast, wharves

C. The Port and its Railroads and Vessels

Port History As you look out over the Hudson River today, you may still see an occasional tugboat pushing a barge up river, a tanker moving slowly through the water or an ocean liner bound for the islands pulling out of port.

But only a few decades ago, the waters and the piers along the New Jersey side of the Hudson were swarming with activity. Boats often had to wait nearly two hours just to unload their freight. Between the ferryboats moving passengers back and forth across the river, the railroad carfloats transporting freight, and the tugboats each sounding their own individual steam whistles, the harbor looked and sounded like a traffic jam in midtown Manhattan.

Between 1910 and 1960, New York and New Jersey made up one of the leading ports in the world. As cargo and immigrants sailed in from the Atlantic on ocean liners, freight was transported across the harbor on barges and lighters, and people crossed the river on

ferries to connect with thirteen different railroad lines on the New Jersey side of the Hudson....

At the harbor's peak, the Pennsylvania Railroad alone had more than 500 hulls in the water and there were several thousand boats in the harbor. Many of the ships lining the New Jersey side of the Hudson were ocean liners. The history of her docks and piers would not be complete without the great ships that docked there.

In the early days, from the 1880s until about 1910, most of the ships were German. The Hamburg-Amerika Line and North German Lloyd dominated the transatlantic traffic and owned docks up and down the riverside of Hoboken. But, when World War I erupted, the German-owned docks and piers were seized and locked. The German ships were eventually replaced by another great shipping company. The Holland-America Line. From 1910 through 1963, this major transatlantic steamship company docked in Hoboken and in 1947, they bought the property making them the only major transatlantic steamship company to own its own terminal in the port....

Ligherage and Railroads The geographical asset for shipping presented a major problem for railroading—the link between cargoes and their destinations across the United States was interrupted by the Hudson River. Unlike most ports where railroads could transport goods directly to the berths of large vessels, all but one railroad company, New York Central, had terminals ending on the New Jersey side of the Hudson. The ligherage system was developed for transferring cargo, so goods could pass through to cargo ships for passage across the Atlantic. The term lighter originally referred to vessels used to lighten the load of ships attempting to dock in shallow waters.

Of course, there were many types of marine equipment moving back and forth across the harbor at one time. Carfloats could accommodate rail cars back to back for up to three hundred feet and could line cars up next to each other three tracks abreast. These particular carfloats were known as transfer carfloats. Station floats had a platform in the middle of two tracks and allowed freight to be moved from one car to another while the railcars stayed on the float.

Almost none of this marine equipment could get anywhere under its own steam. The only ligherage equipment that was self-propelled was an occasional barge delivering mail. Most everything in the harbor would have been dead in the water without tugboats. The tugs pushed, pulled, and maneuvered—they were the heartbeat of the ligherage system, with each rail line from Erie, to Pennsylvania Central, to New York Central operating its own fleet of tugs.

The efficient movement of goods across the Hudson was provided by the railroads free of charge to their clients to, at first, to compete with canal boats, and later to keep the port a viable destination for shippers. By the 1920s, each railroad company owned a significant piece of property in the form of terminals in New York and New Jersey, and was forced to protect its investments by providing free ligherage.

There were freight terminals in Weehawken, Hoboken, and Jersey City, New Jersey. On the West side of Manhattan, there were piers on Barclay Street, 33rd Street, and 60th Street. Even New York Central developed facilities on the New Jersey side of the Hudson to handle freight that had to cross the river.

At the harbor's peak, the Pennsylvania Railroad alone had more than 500 hulls, and there were several thousand boats in the harbor. In Greenville, New Jersey, the Pennsylvania Railroad, and the New Haven Railroad owned property. At Pavonia Avenue in Jersey City, was once the Erie Railroad Shipyard and marine department, and the New York Central Railroad moved goods to terminals in Williamsburgh, Brooklyn, and Port Morris in the Bronx.

The lighterage system was a boon to the shipping industry. Because railroad companies absorbed the additional costs of lighterage, the shippers stayed happy but eventually the cost to the railroads became prohibitive. Expenses for the lighterage system continued to climb as the volume of cargo decreased. Trucking and container ships quickly moved in and the railroads could no longer compete. By the mid 1970s, Erie was the last railroad operating a transfer tug and a carfloat in the water, and in 1975, the Erie's tugboat Elmira made its last trip across the river from New Jersey to Manhattan.

A system of moving cargo that at one time consisted of float bridges, carfloats, tugboats, ferries, and barges—more than 2,500 pieces of marine equipment chugging back and forth across the Hudson River—has virtually disappeared...

Excerpted from *The Lighterage System in the New York/New Jersey Harbor*. A publication of The Hudson Waterfront Museum, in conjunction with the Exhibit on the Lehigh Valley Covered Barge, #79. Liberty State Park, Jersey City, New Jersey. July, 1992. pp. 5-11.

Discussion Questions

1. During what years were New Jersey and New York among the leading ports in the world?
2. What types of floating vessels were at the core of the port's trade activity? What type of transportation required the different types of floating vessels?
3. Describe the change in ownership of ships between the 1880s and 1963.
4. What was the geographical factor that required railroad terminals to be located in New Jersey? List some of the terminal locations.
5. What system was developed to transport freight across the Hudson? What is the origin of the word that describes this transportation system?
6. How did these vessels transport cargo?
7. Name several of the types of lighterage vessels and describe how they moved.
8. How do you think most cargo is now shipped across the Hudson?

Vocabulary

asset, barge, berths, carfloats, chugging, fleet, freight, hull, lighterage, lighter, maritime, ocean liner, pier, swarming, tanker, transatlantic, tugboat,

E. Types of Vessels

Lighterage Tugboats (19th-20th centuries) A standard tug was long and narrow, with a long deckhouse and wheelhouse surrounded with windows. The largest working in the port, called transfer tugs, measured 110 feet in length. They were designed to handle 300-foot carfloats moving railway cars between terminals on opposite sides of the harbor and were characterized by extra high wheelhouses for visibility over the cars and tall stacks. The smallest, called a drill or shifting tugs and measuring 70 feet in length, were used to move barges within a slip or between piers within a terminal.

Sloop-rigged sailing craft These were the earliest self-propelled lighters, used primarily in the 19th century. Some may have begun life as Hudson River packets, but in later years, the majority were clearly built for the harbor. They had very boxy lines, with a beam almost half their length. One massive timber supported the rig; a large mainsail and a single jib set to a short bowsprit. The main had no boom and was furled by dropping the gaff and brailing the whole works in the mast.

Hold Barges (also called coal barges, coal boxes, grain boxes, boxes, or box barges) carried bulk cargo. They were built to carry cargo in the hold not on deck; they were equivalent of the railroad gondola. One or more large hatches took up most of the main deck (the marine term “hatch” refers to the opening, not the cover for the opening.) Those built for use around the harbor were typically 90-120 feet long and about 30 feet wide. They were basically rectangular, and their sides and ends were vertical, except at the lower portion of the ends, which were curved or oblique (“raked”). A cabin was generally at the stern, standing on the main deck or sunk into it. Hatch covers might be present, especially if they were carrying grain. Railroads and private companies, such as coal dealers, owned a large number of these barges.

Deck Scows Typically about 90’ x 13’, these were equivalent of a railroad flatcar and carried miscellaneous cargo stowed on the main deck, with the hold serving mainly as a flotation. The hull was built as a kind of thoroughly braced box with specific characteristics that make it distinctively different from more traditional types of vessels. The captain’s quarters were in a small cabin at the stern. Plain open deck scows usually had low coamings at the sides and might have high bulkheads fore and aft on deck, to guard against shifting cargo.

Lighters (derrick lighters, hoisters, stick lighters) The term “lighter” most often refers to craft built like deck scows but with the addition of a mast, boom and hoisting gear, and without the deck bulkheads; the captain’s quarters shared a cabin with the hoisting gear. Lighters could carry 250 to 400 tons, and were used to handle all kinds of cargo, using tarps for protection from the weather. They were much more common than plain deck scows in the railroad navy, at least before the 1950s.

The ancestor of this type was the self-propelled sailing lighter with a mast that carried both sail and hoisting tackle. These (plus the wooden carfloat) were the type of craft of the railroad navy from about 1870-1890. In the late 19th century, the sail generally went out of use because haulage by tug was more efficient (though private industries used them until about 1920). The lighter became squarer and larger, but the mast and boom were kept for hoisting small loads (5 tons maximum). The hoist was originally hand-powered, but after about 1910, it was found that steam or gas hoisting engines were worth the investment.

Crane Barges (derrick) Most fleets also included a few additional scows fitted with heavier lifting equipment; extra charges were made if the freight required use of these. In the 20th century, these barges were likely to utilize a steel A-frame instead of a mast, and a steel boom, and possibly, a steel hull, and could lift 25 or 50 tons.

Covered Barges (house barges) These were the equivalent of a boxcar and carried cargo needing protection from the elements. It was basically a deck scow with a “house” on deck; this was a shed superstructure, usually built of barn siding over stud framing, with a captain’s living quarters at one end or on top of the house. It had sliding doors on each side and a hatch at the margin of the roof, joining each door for lifting cargo vertically...In most of the railroad fleets, covered barges were the most numerous type of vessel. For carrying perishables, some covered barges had walls sheathed on the inside and filled with insulation. They were equipped with ice bins and stoves to serve as the equivalent of railroad refrigerator cars.

Some of the earliest covered barges were used to transport people rather than cargo. From the 1820s into the 1850s, a number of “safety barges” were built for the Hudson River. They looked much like steamboats, but had no propelling machinery. Towed by steamboats or towboats, they provided transportation for people concerned about the danger of boiler explosions on steam-propelled craft “Immigrant barges” were used to move arriving passengers from liners to Castle Garden and later Ellis Island, and from there to rail terminals in New Jersey.

The earliest fully enclosed barges were simply craft of the types described above with their sides completely walled in with wooden planking. Their hulls still conformed to the steamboat shape, with pointed bow and a round counter stern. The deckhouse filled most of this area, only squared off well forward, and following the curve of the counter aft. Their hulls were light enough in construction to still need a system of hog chains, supported on several masts, to provide longitudinal strength. One use for barges of this type was the transport of block ice from points up the river to the city. In this case, several windmills with furling sails would surmount the deckhouse for pumping meltwater out the hull while en route.

Carfloats By the late 1860s, railway cars were being transported across the harbor on specially designed car floats. They were oversized scows (a flat deck) on which railroad tracks were laid for the transportation of loaded and empty railroad cars between railroad terminals. Early wooden carfloats measured 240 feet in length, and later steel ones, built

for the 20th century, measured over 300 feet. The latter, which could carry from 21 to 23 freight cars, were called “Broadway carfloats” by tug crewmen. The floats usually had no quarters for the crew.

Two types of carfloats were developed: transfer carfloats that discharged cars at their destination, and station or terminal car floats that only discharged the contents of the cars. The transfer floats usually had three lines of rails from bow to stern. The terminal floats substituted a long, narrow platform with a sheltering roof for the middle track. They were usually moored at the end of the platform lined up with a warehouse door. Portable gangways were then placed between the doors of the freight cars and the platform, and between the platform and the warehouse door, providing a route over which to move the goods by hand truck. Cargo could also be transferred from car floats lying alongside oceangoing vessels by placing one empty flat car in the string of cars next to the ship’s side. The goods were then moved from the freight cars to the flat car over the platform and portable gangways, to be hoisted with the ship’s gear.

Floating Grain Elevators (19th-20th Centuries) These were very specialized craft carried a tall superstructure designed to lower a “grain leg” into a hold barge carrying grain; the grain was raised to a hopper at the top and then dumped through a spout into a waiting ship. Hull types varied, and some were self-propelled.

Maintenance and Work Barges These included non-revenue types of vessels, including pile drivers, floating cement plants, etc. They were often converted or rebuilt from other types of scows.

Steam Lighters In addition to the above, several railroads operate self-propelled lighters, able to quickly slip in and out of congested slips to make express deliveries. They were built like tugboats, with molded (curved) lines, but with a beamier and lighter hull. There were three kinds of steam lighters, all with their own steam hoisting gear:

- single masted open, wheelhouse well aft, large open deck forward
- two-masted, wheelhouse near amidships, open decks for cargo both forward and aft
- covered, with a deckhouse running almost from bow to stern, sliding door in side for loading, wheelhouse at forward end of upper deck.

Refrigerator Barges The railroads also operated insulated covered barges in which the cargo could be kept either refrigerated or warm. . .Refrigeration was accomplished by building free standing ice bunkers within each end of the deckhouse, lined with slats. The blocks of ice were lowered into them through hatches in the roof. Horizontal doors on the inside-facing walls of the bunkers were opened to circulate cooled air. Heating was done with a stove installed near the center of the deckhouse.

Steel Covered Barges These were the last generation of wooden covered barges built from a different material. Steel houses were added to the basic deck scow. Later barges built for McAllister Brothers --a company that transported coffee from Brooklyn to the

Maxwell House plant in Hoboken, New Jersey—and others, had vertical outside ribs for strengthening.

Excerpted and adapted from:

Brouwer, Norman. “Moving Goods with the Port.” Chapter 5 of *The Port of New York: A History: 1860-1985. Seaport*. Spring 1987. Pp. 30-35.

Flagg, Thomas, “The Vessels of the Railroad Navy at the Port of New York, Part I: Overview and Deck Scow.” *Transfer* No. 22, January-April 1997. Rail-Marine Information Group. pp. 3-11.

The Hudson River Covered Barge

Discussion Questions

1. What were the primary uses of barges?
2. List each type of barge and specify for what it was used. What are the similarities and differences among the vessels?
3. What type of barge is LHV #79? What physical characteristics does the barge have that suggest it is this type of vessel?

Vocabulary

aft, amidship, beamier, boom, bowsprit, brailing, bulkhead, carfloat, coaming, craft, deckhouse, discharge, flotation, fore, furred, gangway, hoist, hopper, insulation, hull, jib, lighterage, mainsail massive, mast, moored, oblique, packet, perishable, pier, raft, railroad gondola, rectangular, rig, self-propelled, sheathed slip, slat, sloop, stern, superstructure, stud framing, surmounted, tarps, timber, wheelhouse

F. Work on the Barge

There were many and varied jobs generated by the lighterage system in the harbor. Barge captains, longshoremen, engineers, oilers, mates, pilots, woodworkers, metal workers, floatsmen—all had a part in moving freight from one side of the river bank to the other. Some were working for private companies like the Meseck Towing Line. Some worked for related industries like the Sobork Woodworking Company, carving eagles for tugboats, or for a company like Union Dry Dock in Hoboken—cleaning, painting, and maintaining marine equipment.

The jobs generated by the railroads are of particular interest since so many railroad companies were involved in their own maintenance. The Erie Railroad alone had an enormous maintenance facility on Pavonia Avenue in Jersey City.

Back then, the shoreline was the hub of transportation and commerce. It was a place for straining muscles and earning a living. Many times, whole families worked together for

the same company, or at least in similar occupations. Generation after generation worked for the railroads, where seniority was everything. On railroad tugs, a worker could start out as a fireman, work his way up to oiler, and perhaps eventually make it to engineer.

Jim O'Day, Barge Captain

My father was a barge captain. It was a demanding job. There were times that cargo would require heat, so he would have to keep a stove going in the freight house to keep the cargo warm. Sometimes the cargo needed refrigeration, and the barge had an area that had to be loaded with ice.

I remember my father made flower boxes and shutters for the cabin windows. He was quite a carpenter. He made all the furniture in the rooms, the cabinets for the kitchen, and he kept the boat in good repair himself. My father also made swings in the freight house. While the boat was empty, we would play on the swings, and when it was time to load the boats, he would tie the swings up.

For relaxation, there were rafts we would use that would be hooked up between the barges and the piers. Families from different boats would get together and have little picnics on these rafts, and then they would swim and crab and fish.

When I was eighteen, in 1947, I started on the barges. I always associated certain smells with my childhood—like the scent of oakum and the ropes on the boats. You could get a job with the railroad through family. I decided that I'd like to try it, so I went down and applied, and got the job of barge captain.

A barge captain didn't necessarily have a pilot's license. Barges were not self-driven; tugs had to take them everywhere. Barge captain meant you took care of the safety of the vessel. I would clean up the boat, check the safety lines, check the hatches. I checked the cargo on and off, made manifests, and kept logs. I guess the major changes, from my father's day, was the amount of hours you had to work, and the pay. In the winter, it wasn't the nicest job in the world—you were out in all kinds of bad weather. But, on a nice day, once you caught up with your paperwork, it was a great job.

Sal Notarile, Barge Captain

My name is Salvatore Notarile. I've been in this business since July 10, 1952. I hold a first class pilot's license and a master's license.

When I was a child, I used to see tugboats. I'd be going over the Manhattan Bridge by subway, looking down with my father, and say: "Why don't I get a job like that on a boat?" I was a little boy. And lo' and behold, I had the opportunity to be hired. On the Erie, we had twelve boats. We had about 36 crews when I first started out in '52 and we were considered small compared to the New York Central and the Pennsylvania. In the old-time railroad, there were whistle signals. It was constant communication by whistle. We used hand signals when the crew was in view, but when we had ten, eleven,

or twelve barges grouped together, and made up with lines in between, you were obscured from the crew, and all the signals were whistles.

I knew I wanted to become a captain. Everybody does. Everyone on deck wants to. Most people wouldn't admit it...But everybody wants that license, that's for sure. When I stood for my first class pilot's license, you had to be sponsored by two captains with a letter from the company. It was a written examination that took five days and you had to maintain ninety percent. They'd give you five questions at a time and they wouldn't waste your time or their time. They could tell if you maintained a ninety- percent level. If not, they'd stop you right then and there and say" "Come back in thirty days." And that's what happened to many people. It discouraged them from coming back after thirty days, or discouraged them from getting their license. I've seen people who had the mental ability to pass any examination, but whatever held them back, I don't know. Maybe they never wanted to face the responsibility of the boat.

We're a one-crew outfit now, but in years back, in a twenty-four hour day, you had three crews aboard. We carried anything and everything, including livestock. We used to take carloads of cattle and sheep right from the Erie Railroad in Jersey City over to Hunter's Point, to the Long Island Railroad. We used to have a General Motors contract where we had complete automobiles, side view mirrors and all, encased. Typical cargo now, cross-harbor, is newsprint, bricks, lumber, oil, syrups....

Jack Quimby, oiler and engineer
Lackawanna Railroad marine division

My name is Jack Quimby and I started with the Delaware Lackawanna Invested Railroad in May of 1951 as a fireman on their tugs. I worked on the railroad ferries until the final trip, Thanksgiving evening, November 1967.

The tugboats had three furnace boilers, scotch boilers—about 150 pounds of pressure. The boats had been built around 1901 to 1903, so they weren't too new at the time. They had two, three, or four furnaces. The Bronx was the biggest one—it had four furnaces of one thousand horsepower. It carried two of what they called Broadway carfloats with twenty-one cars a piece, up to the Harlem transfer on the Harlem River.

Most people think that to build a coal fire, you just pour in the coal. Well, sooner or later, the furnace became chock-full of ashes. So, you had to ream the fires and pull the ashes out with ash hoes, one at a time. You were fighting the clock and the steam pressure gauge at the same time. Meantime, the engineer was screaming down the hatch at you to keep the pressure up. It got rather entertaining, but when you're twenty years old, you don't worry about that.

I started as a coal passer—a fireman. You bailed about a ton of coal an hour, and then you'd take out the ashes—about a third of the weight—on the hour. It was quite a job. They called my "fire boy" even after I got to be twenty-five and had a family of three children.

My father taught me something about steam engines. He was an engineer, so maybe I had an edge on the rest of the gang. I graduated to oiler because I had mechanical ability... It's a way of life that's totally gone today. There were rough parts of it like anything else, but I enjoyed it. The best parts were the camaraderie and seeing the moving machinery. The smell of the oil and coal and everything else. The fact is, you're young and you're strong, and you think: Wow, this is the life!

Excerpted from *The Lighterage System in the New York/New Jersey Harbor*. A publication of The Hudson Waterfront Museum, in conjunction with the Exhibit on the Lehigh Valley Covered Barge, #79. July, 1992. Pp. 16-17, 22-23, & 24-27.

Discussion Questions

1. What types of jobs did people have on barges?
2. What was similar about the work the speakers did? What was different? What were the feelings these workers had about their work?
3. What people in the speakers' lives influenced their choices to work on barges?
4. What licenses or experience did the men need for their jobs? How did these credentials support their work?
5. What types of skills do you think you would need to have a job on the barge?

Vocabulary

barge, commerce, engineers, floatsmen, hub, lighterage, longshoremen, mates, metal workers, oiler, piers, pilots, raft, woodworkers

VI. Visuals

- 1) Picture of LHV #79
- 2) Current map of Brooklyn
- 3) 1930s map of Brooklyn waterways
- 4) Picture of New York harbor
- 5) Diagrams of lighterage vessels
- 6) Pictures of Lehigh Valley railroad

VII. Teaching and Learning Activities

A. History of New York City's Port

Step 1: Have students brainstorm and discuss associations with the word port. Chart and synthesize their responses. Explain what a port is, where it is located, and what its role is in terms of trade, travel, recreation, etc. Ask students if there is a port in New York and where it might be located. Show students a New York City map and ask them to identify ports or areas where they believe they are situated.

Step 2: Explain that the port was active even before New York was a city, and that it continued to grow, particularly during the industrial era, and was at its peak during World War II. Distribute or display maps and pictures that highlight the port's makeup and activity. Direct students to read "New York's Growth into Maritime Trade" (Reading B), and then respond to the discussion questions.

Step 3: Divide students into small groups and instruct them to create a timeline documenting New York's port activity to the present. Display the group timelines around the classroom for students to review and discuss.

Step 4: Have students conduct research on the present status of the port and waterfront by contacting metropolitan waterfront advocacy organizations. Based on their research and timelines, instruct students to share their predictions about the future of the port. They should add these predictions to their timelines.

B. Moving the Goods

Step 1: Divide the class into groups of 4-5 students each. For each group, provide model trains and boats, and smaller items that represent cargo. Show students a visual (map or drawing) that exhibits the following dilemma, which should be read to the class:

Cargo or merchandise carried on a railroad must be delivered to other areas in the United States, but there is no direct railroad connection to these locales because of a major geographic boundary—a body of water that stops the railroad from moving forward. There are no bridges, tunnels or other delivery methods that would allow for the transport of freight.

Tell students that using the models and the visual, their task is to figure out a strategy to resolve this dilemma. (Older students can solve the problem through discussion.) Have each group present its strategy to the class, which can pose questions regarding or make suggestions about groups' strategies.

Step 2: After the groups' presentations, explain that during the peak of maritime trade in the port of New York, this railroad-to-port cargo delivery was an actual dilemma. On a map, point out the geographical limitations that prevented railroads from going into certain areas of New York and New Jersey. The geographical asset for shipping presented a major problem for railroading—the link between cargoes and their destinations across the United States was interrupted by the Hudson River. Unlike most ports where railroads could transport goods directly to the berths of large vessels, all but one railroad company, New York Central, had terminals ending on the New Jersey side of the Hudson.

Step 3: Ask the students to review group strategies to determine which one most accurately addressed this transport issue. Explain the period during which the lighterage system began and why such a system was necessary.

Step 4: Divide students into small groups. Direct them to read “The Port and its Railroads and Vessels” (Reading C) and then respond to the discussion questions.

Step 5: In the same small groups, have students research a railroad line (including the Lehigh Valley Railroad) and its shipping vessels that were key to New York’s maritime trade. Data sources should include print and Internet materials, outreach to railroad and historic organizations, and contacts with waterfront and port historians and personnel. Instruct students to include the line’s history, its typical routes (with maps or charts, if possible), the number of vessels in its lighterage system, where it had terminals, the type of goods it carried, etc. Ask each group to write a profile for its railroad that includes pictures, charts, maps, etc. Help students compile their profiles into a bound collection. Present each student with a photocopy of the collection.

Step 6: Have students review the collection to analyze and discuss common factors that contributed to the railroad lines’ growth and prosperity of the railroad lines and demise as industrialization and technology changed maritime trade.

C. Types of Vessels

Step 1: Explain to students that the lighterage system was comprised of vessels with varied physical capacities for transporting different types of cargo. Most of these vessels are obsolete—some remain as museums—while others have been adapted to the modern world. Direct students to read “Types of Vessels” (Reading E) and respond to the discussion questions.

Step 2: Divide students into small groups. Instruct each group to discuss the similarities and differences among various types of lighterage vessels. Direct students to create a chart highlighting these similarities and differences, creating headings common to all the barges, such as barge name, era, goods carried, structure, etc. Have the groups compare charts to confirm or revise information.

Step 3: Have each group select a barge in which it is interested, and then recreate it as a model, drawing, etc. Invite each group to research additional actual historic information about its barge category. For example, a group can select a railroad company that used its type of barge. Display the reproductions with their descriptions and history. (Students may want to exhibit their models or drawings at LHV #79.)

D. The Workers

Step 1: Ask the students to list as many types of jobs maritime trade might have provided, from running the railroad to working at the waterfront. Direct them to read “Work on the Barge” (Reading F) and then respond to the discussion questions. Ask students to add other jobs to their lists highlighted in the reading.

Step 2: Have students conduct research on the variety of barge jobs available during the lighterage area. Each student selects one type of worker—fictitious or actual—and writes

several diary entries about his or her daily life on a barge, using, where applicable, actual historic data regarding railroad lines, cargo, shipment routes, etc.

Step 3: Ask students to read their entries as dramatic monologues or recreate their personages through role plays.

VIII. Supplemental Resources

Brooklyn Historical Society
www.brooklynhistory.org

New York State Museum
<http://www.nysm.nysed.gov/>

New York Public Library Digital Library Collection
<http://digital.nypl.org/>

Maritime History on the Internet
<http://ils.unc.edu/maritime/general.shtml>

National Railway Historical Society
<http://www.nrhs.com/photos/scenes.htm>

Sea History
<http://www.seahistory.org/>

American Memory
<http://lcweb2.loc.gov/ammem/ammemhome.html>

New York History Net
<http://www.nyhistory.com/links/education.htm>