They are not beautiful. Freighted low down, their steel sides scraped and marred like the hands of a labourer, their huge funnels emitting clouds of bituminous smoke, their barren steel decks glaring in the heat of the summer sun, there seems to be but little about them to attract the pleasure seeker.

—James Oliver Curwood, *The Great Lakes*, 1909

In the years immediately following World War I, the maritime industry benefitted from technology developed during the war by the military. In 1922, the *Str. Daniel J. Morrell* became the first ship on the lakes to be equipped with a gyrocompass, which soon replaced the magnetic compass as the standard navigational tool. The gyrocompass is a mechanical compass that utilizes the forces of gravity and inertia, rather than magnetism, to determine true north, or what we would refer to as the North Pole. Unlike magnetic compasses, gyrocompasses are not affected by the earth’s magnetism or ferrous metals in proximity to them.

Magnetic compasses, on the other hand, are simply sensitive magnets that will react to any iron objects that disturb their magnetic field. Magnetic compasses, in fact, do not point to polar north; they vary from polar north because of magnetic disturbances within the crust of the earth. In the Great Lakes region, compasses will show variation from true north as the result of iron ore deposits that attract the slender magnet that serves as the needle of the compass. The usual amount of these deflections are known and are shown on navigational charts so that mariners using magnetic compasses can correct for the amount of variation. However, magnetic compasses are also subject to deviation as a result of magnetic forces in the immediate vicinity of the compass. The steel hull of the ship itself affects the compass, as will magnetic fields resulting from the operation of electric motors near the compass. In fact, a crewmember standing close to a magnetic compass with a wrench in his pocket can cause the compass to deviate dramatically.
While transient deviations are a problem that mariners are sensitive to, but have to live with, those more constant deviations caused by the normal magnetic forces that exist aboard a ship can be “compensated” to eliminate most of the deviation. This is done by placing magnetic objects on each side of the compass and adjusting their position until deviations caused by the magnetic field of the vessel are substantially eliminated. Most magnetic compasses used aboard commercial vessels have a large metal ball mounted on each side of the compass for use in compensating for deviation.

Gyrocompasses, however, because they do not operate on magnetism, are capable of being adjusted so that they do point to true north. While their accuracy is somewhat dependent on the location and speed of the vessel, they are much more accurate than magnetic compasses. Commercial vessels on the lakes still have magnetic compasses aboard, but crew members rely almost totally on gyrocompasses for navigation.

The year 1922 also saw the beginning of marine radio communications on the Great Lakes. Using a 500-watt Navy surplus transmitter, radio station WCAF began broadcasting messages in Morse code to a limited number of ships on the lakes equipped with radio receivers. WCAF was owned by the Michigan Limestone and Chemical Company of Rogers City, Michigan, operators of a massive limestone quarry—the Calcite Plant—along the northern shore of Lake Huron. The first broadcasts were to vessels of the Bradley Transportation Company, a subsidiary of Michigan Limestone. Bradley was subsequently purchased along with the quarry by U.S. Steel and is today operated as part of the USS Great Lakes Fleet. A few ships of Boland and Cornelius Shipping, which has since become American Steamship, were also equipped to receive the early broadcasts from WCAF. Before the opening of the 1923 shipping season, the radio station was licensed as a public station that could serve any fleets on the lakes. The station’s call sign was changed to WHT and a stronger transmitter, capable of broadcasts in both Morse and voice, was installed.

A Bradley freighter, the Carl D. Bradley, which was subsequently renamed and operates today as the Irvin L. Clymer, was the first ship equipped to receive and transmit messages in both Morse and voice. By 1924, there were about twenty vessels on the lakes that had been equipped with Morse and voice equipment, despite outspoken objections from most of the captains who commanded the freighters. The captains feared that ship-to-shore communications, particularly in voice, would lead to the fleet offices attempting to control the daily operations of their ships. They were willing to accept the use of Morse communications, which tended to be shorter and more formal because the messages had to be transmitted by a radio operator. But they feared voice communications would allow office personnel to merely sit down at a microphone and dictate orders to their captains. After all, what did those landlubbers know about the hard realities of running a ship on the lakes? That had always been the captain’s bailiwick. After a two-year test of the voice communications system, which included broadcasts of news, religious services, and an occasional live talent show, the captains won out. WHT reverted to the use of only Morse transmissions at the end of the 1924 shipping season.

In late 1924, the little station at Rogers City changed its call sign again, to WLC, concurrent with acquisition of a powerful 10,000-watt transmitter from Navy surplus. WLC continued to serve the fleets on the lakes with Morse, or radiotelegraph, communications until the early 1940s, when voice broadcasts were again instituted. Despite continued opposition from many captains, voice rapidly became the sole mode of both ship-to-shore and ship-to-ship communications. WLC continues to serve the industry today, along with many other marine radio stations scattered around the lakes. While voice communications still predominate, using VHF or singlesideband radios, a number of fleets are now relying on sophisticated telex and satellite transmissions to send messages between the ships and fleet offices.

Communication costs are high for the fleets on the Great Lakes. On the U.S. side of the system, most fleets relied for many years on the Great Lakes Maritel Network to handle their communications between company offices and their ships. The Maritel Network, a VHF voice system operated by Lorain Electronics of Lorain, Ohio, consists of a network of stations around the lakes that are automatically tied in to the firm’s central radio facility in Lorain by telephone lines. All calls from ships are handled from Lorain, regardless of the ship’s location. Because of the limited range of VHF transmissions, a ship operating on the upper lakes cannot contact...
Lorain directly. Instead, the call is made to one of many unmanned relay stations around the lakes. Through the relay station, the ship is connected with the Lorain facility and tied into the regular telephone system. Because the system is almost completely automated, it is possible for shipboard personnel to make direct dial calls to any shoreside telephone.

The Maritel Network is an expensive operation, however. During the 1984 season, fleets subscribing to the service were billed a total of $1.3 million, most of which represented overhead costs for maintaining and operating the system. Each fleet’s share of the total was apportioned based on the fleet’s share of the total gross vessel tonnage operated by the companies subscribing to the service. As the number of ships in operation on the lakes declined and the shares apportioned among fewer ships, the high costs of operating the Maritel Network became increasingly difficult for the fleets to justify. As a result, most of the fleets withdrew from the network at the end of the 1985 season, although many still use the system occasionally, paying on a per call basis.

To reduce their need to rely on the Lorain system and in an effort to reduce their communications costs, a number of fleets installed cellular telephone systems aboard their ships. Cellular phones, the latest generation of mobile radiotelephones, are primarily designed for business use in urban areas. Much of the lower lakes, in the Cleveland-Detroit-Chicago corridor, is served presently by cellular systems, but it will be a number of years before the service can be extended to the northern lakes.

Where cellular service is not available, the fleets either use the Lorain VHF system or singlesideband transmissions through WLC. To further cut costs, several companies using singlesideband have also installed SITOR telex equipment. Messages to be broadcast via SITOR are first prepared on a microcomputer using standard word-processing software. The messages can then be transmitted over the radio link at a very high rate of speed, which reduces the transmission costs.

Two of the U.S. fleets and several Canadian fleets have also installed satellite communications (SATCOM) systems aboard some of their vessels. SATCOM messages, which can be either voice or data, are bounced off communications satellites circling the earth and relayed by a land station via regular telephone lines. The SATCOM systems are highly effective, but expensive to install and operate.

A study of communication costs conducted in 1985–86 by Columbia Transportation showed that satellite charges were among the highest of any of the alternative modes, about $10 per minute of air time. By comparison, the Lorain VHF system then cost about $10 for the first minute and $3.35 for each additional minute; singlesideband cost $3.50 a minute; and cellular transmissions cost $1.00 to $1.25 per minute.

As the cellular system is expanded to serve the less-populated areas on the northern lakes, it is likely that more and more companies will rely on cellular phones for their primary ship-to-shore and ship-to-ship communications. In the interim, the fleets will use a mix of systems, while continuing to use VHF for ship-to-ship transmissions that do not need to go through a shore station.

Another piece of equipment that was put into use for marine navigation after World War I was the radio direction-finder (RDF). Since there were few radio stations operating around the lakes at the time, the Navy installed a system of radio beacons for use specifically in direction finding. The beacon transmitters broadcast a continuous radio signal, usually a letter of the alphabet repeated continuously in Morse code. Locations of the beacons and other commercial broadcast stations around the lakes were printed on the navigational charts carried aboard ships.

RDF is nothing more than a radio with a sensitive directional antenna. When the radio is tuned to a radio transmitter in a known location, the operator is able to determine the line bearing from the ship to that transmitter. By taking bearings on two or more transmitters, the navigator can plot a reasonably accurate location of the ship through triangulation.

RDF was an important navigational tool on the lakes until the use of radar became widespread after World War II. A few ships still have RDF equipment installed in their pilothouses, though it is no longer used.

By the end of World War I, major strides had also been made in perfecting internal combustion engines, both gasoline and diesel, and in 1924 the 611-foot Henry Ford II became the first large vessel on the lakes to be powered by a diesel engine. The Henry II, as it is commonly referred to, was desig-
The M/V Henry Ford II, the first large ship with a diesel engine on the Great Lakes. Launched in 1924 as the flagship of Henry Ford’s fleet, it originally carried a portable elevator on its deck for use by the famous automaker and his guests. (Author’s collection)

nated as a Motorship (M/S) or Motor Vessel (M/V) to differentiate it from the steamers that dominated the fleet on the Great Lakes. Today, the M/V designation is most often used.

The 3,000-horsepower diesel engine installed aboard the Henry II was both smaller and lighter than comparable steam engines, and it required fewer crewmembers to operate it. On the other hand, diesels were considered less reliable than the time-tested steam engines that powered most lakers. While other diesel-powered ships followed in the wake of the Ford boat, they did not come into widespread use until the 1970s.

Another innovation on the Henry II was the first use of electric winches on the lakes. The winches are located on deck and are used to moor the vessel and open and close hatch covers. Until the construction of the Henry II, all ships on the Great Lakes used steam winches that operated off steam generated by their engine room boilers.

The launching of the M/V Henry Ford II in 1924 marked Ford Motor Company’s entry into Great Lakes shipping. Henry Ford, founder of the Ford Motor Company, personally presided over the gala launching of the ship, the first to fly the fleet flag of the giant automaker. Ford named the boat after his then seven-year-old grandson, who eventually went on to become president and chairman of the board of the Detroit auto company.

Most of the freighters on the Great Lakes have been named for executives in the shipping, mining, or steel industries, or for members of the owner’s family. Three of the ships in the Ford fleet were named for grandsons of Henry Ford—the M/V Henry Ford II, the Str. Benson Ford, and the Str. William Clay Ford. Other ships that have flown the Ford flag
have honored top executives of the auto company—Ernest R. Breech, John Dykstra, and Robert S. McNamara, perhaps better known as secretary of defense under President John F. Kennedy. While the namesakes of most of the Ford boats were familiar to people outside the shipping industry, those of most Great Lakes ships are largely unknown to people outside of the industry. It is even quite common for crewmembers aboard lakers to be unaware of the person for whom their ship has been named.

Most of the boats bear men’s names, since the shipping, steel, and mining industries have historically been dominated by men, even though ships have for centuries been referred to using the feminine gender. “What boat is that,” a crewmember might ask one of his shipmates, pointing at a passing freighter. “Why, she’s the George A. Sloan,” would come the seemingly contradictory reply. The feminine pronoun is always used, even though the ship is named after a man.

While Great Lakes ships are generally named for industry leaders, there have also been many ships with more imaginative names. The same year that the Henry Ford II made its debut, the Minnesota-Atlantic Transit Company began putting together the famous “poker fleet” of the lakes. All of the ships in the fleet were named after playing cards: Lake Ace, Lake King, Lake Queen, Lake Jack, and so on. Ships in the Cleveland Tankers fleet have always been named after celestial bodies, such as Meteor, Jupiter, and Saturn. Canada Steamship Lines has had classes of ships named for rivers, forts, and bays,
while the company’s self-unloaders have all had Indian names. Cleveland-Cliffs named many of its ships after explorers and pioneers who played important roles in the early development of the Great Lakes region, such as the Str. Frontenac, named for the French explorer, and the Str. Pontiac, which bore the name of the famous Ottawa chief. Columbia Transportation named a number of its ships for steel companies or steel mills that have been major customers for the fleet, including Armco, Ashland, Middletown, and Reserve. Tankers in the Halco fleet have taken their names from bodies of water, such as the Bay Transport and Cape Transport, while the names of self-unloaders in the fleet have all used the suffix “fax,” including the Hallfax, Orefax, and Stonfax.

Some of the more unusual names that have been given to vessels on the lakes include the Str. Maunaloa, which was named after a volcano on the island of Hawaii; the Chicago Tribune and New York News, operated by Group DesGagnes and named after newspapers that were major consumers of the rolls of newsprint carried by the two ships; the Str. Red Wing, named after the Detroit hockey club in honor of Bruce Norris, who was owner of the Red Wings and also a major shareholder in Upper Lakes Shipping, which owned the vessel; and the Highway 16, a car carrier that operated across Lake Michigan and served as the link between terminuses of U.S. Highway 16, which ended at the water’s edge in Milwaukee, Wisconsin, and Muskegon, Michigan. A few ships on the lakes have also been named for women, including the steamers R. W. Webster, Helen Evans, Martha Hindman, Hilda Marjanne, and Kaye E. Barker. Most of the ships bearing women’s names honor the mothers, wives, grandmothers, daughters, or daughters-in-law of fleet executives.

Name changes are very common, and it is not unusual for a ship to operate under two or more names during its career on the lakes. The most common reason for renaming is change of ownership. Some names have also been used for a number of different ships over time, for example, the Benson Ford. The first Benson Ford, like the Henry Ford II, was launched in 1924. In 1982, the fleet decided to scrap the aging ship, but the name was preserved by giving it to a newer ship in the fleet, which had been operating as the Str. John Dykstra. In 1985, Ford acquired two large self-unloaders from Cleveland-Cliffs and one of them, the Edward B. Greene, was then renamed the Benson Ford. The name was in continuous use on the lakes from 1924 until 1989, but on three different ships.

The year 1925 brought three “firsts” to the lakes, including the first one-piece, or patent, hatch covers on a regular bulk freighter, the first ship with twin engines and twin propellers, and the first large vessel built with a steam turbine engine. Single piece hull hatch covers had been used on the small hatch covers of the whalebacks built before the turn of the century, but the first ship with normal-sized hatch covers equipped with single-piece, steel hatch covers was the Str. William C. Atwater. The advantage of the single-piece hatches was that they were capable of better sealing off the hatch openings and did not have to be tarped during inclement weather to keep water out of the cargo hold, as did telescoping and wooden hatches.

While the small hatch covers used on the whalebacks could be handled manually by deckhands, the full-sized hatch covers on the Atwater required the use of a hatch crane. The hatch crane, or “iron deckhand,” as it is often called, straddles the hatches and moves up and down the deck on tracks. Most of the hatch cranes are powered by electric motors hooked into the ship’s electrical generating equipment by a heavy-duty extension cord, which runs the full length of the deck. Some ships have also been equipped with hatch cranes operated by small diesel engines.

The cranes can be operated by one person; three or more crewmembers were needed to remove and replace telescoping or wooden hatch covers. The operator positions the hatch crane over the hatch and lowers two hooks into steel eyes welded to the top of the hatch cover. Motors on the crane then lift the cover and it can be stacked on the deck between the hatch openings. The Atwater was built with 11-foot wide hatches on 24-foot centers, leaving 13 feet between hatches for the stacking of hatch covers.

The single-piece hatch covers speeded up the opening and closing of hatches, reducing turnaround time in port. All straight-deckers built after 1938 were equipped with the single piece hatch covers and iron deckhands. Telescoping hatches continued to be used on self-unloaders, because they had boom supports that interfered with the operation of a hatch crane. Modifications were subsequently made
The hatch covers are secured in place on the rubber-gasketed hatch covering by hatch clamps spaced approximately every two feet around the hatch. The clamps are attached to the hatch covering and can be positioned over the hatch cover and secured. Many types of clamps have been used on both telescoping and single-piece hatch covers, but most contemporary ships use Kestner clamps, which operate on a cam, or double pivot, principle and can be snapped into place by deckhands using a special tool so that the cover is locked securely to the coaming.

Advancements in steam propulsion were reflected on the lakes in 1925 with the launching of the Str. T. W. Robinson for the Bradley Transportation Line. The Robinson was equipped with a turbo-electric engine and was the first major turbine-powered vessel on the lakes, whereas all of the previous steamboats had reciprocating triple or quadruple-expansion engines. In steam turbine engines, the steam produced by the boilers is used to drive a large turbine. On the Robinson, the turbine supplied power to a generator motor that turned the vessel’s propeller shaft. On later steam turbine ships, the turbines were connected to a reduction gear that powered the shaft. Similar to an automobile transmission, the reduction gear is needed because the turbines spin at too high a speed to supply power directly to the shaft. The reduction gear reduces the rotation of the propeller shaft to about 100 revolutions per minute at full power. On reciprocating steam engines, steam pressure is used to drive large cylinders, from 20 inches to more than 60 inches in diameter, which are mounted on a crankshaft similar to what is found in a gasoline engine. The crankshaft supplies power to the propeller shaft. Turbine engines are capable of producing greater power than reciprocating steam engines can.

The Robinson was rated at 3,600 horsepower and was among the most powerful ships on the lakes when it was put into service. The vessel's boilers were fueled by coal, which had replaced the wood used as fuel by the early steamboats on the lakes. In addition to having the first steam turbine, the Robinson was also one of the first ships equipped with mechanical stokers to feed coal to its boilers. On other steamboats, the boilers were hand-fired by coalpassers, part of the “black gang” that manned the dark holds deep in the bowels of the ship where the boilers and coal bunkers were located.

The Robinson, like the other ships in the Bradley fleet, had a grey hull. The color was chosen because the Bradley boats were primarily engaged in transporting limestone, a dusty, grey rock. Painting the hulls of the stone boats grey helped to mask the dust that settled on the hulls when the boats were loading or unloading. Throughout the Great Lakes industry, ships in the cement and stone trades have generally had grey hulls, while ships in the iron ore trade have had rust-colored hulls, and ships in the coal trade have had black hulls. The colors used aren’t the most aesthetic, but they are functional and help to keep lakers looking good even when they are coated with a layer of dust.

By the 1920s, cement had come into wide use in construction of buildings and highways. A number of freighters were converted for use in carrying the dry, powdery bulk material, and in 1923 the Str. Lewis G. Harriman became the first vessel built specifically for the cement trade. The Harriman was followed in 1927 by the Str. S. T. Crapo, both operated by the Huron Portland Cement Company of Alpena, Michigan. The cement boats differ quite significantly from other bulk freighters. To reduce the possibility of water getting into the cargo hold and hardening the cement, the ships have small, circular scuttle hatches for loading, instead of the large, rectangular hatches found on other bulk freighters. When loading, the loading spouts on the
cement storage silos are connected directly to the scuttle hatches so that the cement that flows into the hold is totally protected from exposure to any moisture that might be in the air.

All of the cement boats are self-unloaders, but their equipment is very different from that used for unloading ore, stone, or coal. On the Crapo, air is injected into the cargo hold to lighten up the cement so that it will flow down through gates at the bottom of the hold and into a trough that runs the length of the cargo hold. The cement is then carried to the forward end of the cargo hold by a long auger, or screw, that rotates inside the trough. At the bow, the cement is pumped up and out of the ship by a 2,000-horsepower turbine, which can unload the ship at the rate of about 390 tons per hour. Piping on the cement boat is mated to shoreside piping by a length of large-diameter reinforced rubber hose, and the cement is pumped to the top of the storage silos at the terminals by the ship’s powerful pumping system.

The Robinson, a self-unloader, continued in service until laid up by its owners in the spring of 1982. In 1987, it was sold to a Canadian salvage firm to be cut up for scrap. The Harriman and Crapo continue to operate in the cement trade even though both have put in more than sixty seasons on the lakes. In 1987, when the Crapo celebrated the sixtieth anniversary of its launching, it was one of only four coal-fired steamboats left on the Great Lakes. With coal bunkers getting increasingly difficult to find at ports around the lakes, its owners were considering having the three boilers converted to burn fuel oil.

Shipbuilding virtually ground to a stop on the lakes from 1930–38 as a result of the Great Depression, which greatly reduced the demand for bulk commodities, particularly iron ore. Tonnages plummeted and the majority of the ships in the U.S. and Canadian fleets remained laid up throughout the period. In the midst of the depression, the Coast Guard acted to put loadline regulations into effect for vessels operating on the lakes. The regulations were intended to reduce the number of founderings that occurred as a result of ships being overloaded with cargo. With shipowners constantly trying to maximize the amount of cargo their ships hauled, there was a natural tendency for the ships to be overloaded. The secret to optimum loading is to take on as much cargo as possible, while still retaining sufficient freeboard to insure that the vessel is seaworthy. Freeboard, the distance between a ship’s waterline and its main deck, represents reserve buoyancy, a margin of safety in case the vessel takes on water.

Overloading was a particular problem in the iron ore trade. Because iron ore is such a heavy mineral, it is impossible to entirely fill a ship’s hold with ore without having the deck awash with water. It was against the nature of many shipowners to send a ship down the lakes with a hold only partially full of ore, however, and it was very common for ships to be overloaded to the point where they were no longer seaworthy.

The loadline regulations promulgated by the Coast Guard in 1936 were based on similar restrictions on loading that had been put into effect in England a full sixty years earlier. The landmark British rules were largely the result of lobbying by Samuel Plimsoll, a member of the British Parliament who was concerned about the safety of seamen. During the 1860s, the number of British-flag vessels being lost each year as the result of overloading had reached scandalous proportions. Plimsoll, in an effort to encourage public support for needed ship safety legislation, wrote a book entitled Our Seamen, An Appeal. In it he proposed specific action to deal with nine different causes of vessel casualties. He recommended legislation to prohibit the under-manning of ships, improve transverse stability, regulate vessel construction and repair, and set loading limits. To deal with the problem of overloading, Plimsoll presented the following recommendation:

Let provision be made for painting on the ship’s side what the Newcastle Chamber of Commerce calls the “maximum load line,” and that no ship under any circumstances be allowed to leave port unless that line be distinctly visible at or above the water-line; and let this fact be ascertained and communicated to the Board of Trade by a photograph of the vessel’s side as she leaves the port or dock. It will not cost more than a few shillings, and would save a great deal of false swearing afterwards.2

Plimsoll’s standards for safety were enacted into law in England in 1876 and rapidly spread to other maritime nations. The loadlines painted on the sides of ships came to be known as Plimsoll marks, in recognition of Samuel Plimsoll’s leadership in improving vessel safety.
The Plimsoll mark is painted on each side of a ship’s hull at amidships. On the lakes, the Plimsoll mark actually consists of four horizontal lines, one above the other, indicating the maximum draft to which the vessel can be loaded during each of four seasons of the year: midsummer, summer, intermediate, and winter. For most vessels, approximately one additional foot of freeboard is required during the winter period than during the midsummer period when the lakes are generally calm. The winter period, during which the least amount of cargo can be carried, goes into effect on the lakes on November 1 each year.

Loadlines are assigned to U.S. vessels by the American Bureau of Shipping and a number of other “classification societies,” based on their evaluation of a ship’s seaworthiness. The loadline for a given vessel can change over time, generally as the result of modifications made to the ship that enhance its seaworthiness. Many ships, for example, used to have wooden doors on their fore and aft superstructures on the main deck level. Those doors were particularly vulnerable to being damaged if the ship was taking waves across its deck, which could lead to flooding of the fore or aft sections of the hull. When the wooden doors were eventually replaced by stronger steel doors, reducing the likelihood of their damage and the possibility of flooding, the classification societies often determined that loadlines could be raised slightly without diminishing the vessel’s seaworthiness.

Since each inch of cargo that can be added results in an overall increase in carrying capacity of 100 to 300 tons per trip, there is an obvious economic return on a vessel owner’s investments to improve seaworthiness and operate with the least amount of allowable freeboard. With each ship making fifty to sixty round trips each year, a one-inch reduction in freeboard means that a ship could carry 5,000 to 18,000 more tons per year, a net increase that means more profit in the shipowner’s pocket.

As the recession began to wind down during the late 1930s, Great Lakes shipping companies again began to place orders with the shipyards for new tonnage. Among the first vessels launched at the end of the depression were four new 600-footers for the giant Pittsburgh Steamship Company. Two of the ships, the Str. John Hulst and Str. Ralph H. Watson were built at the Great Lakes Engineering Works in Detroit, while the Str. Governor Miller and Str. William A. Irvin came out of American Ship Building’s Lorain, Ohio, yard. The Hulst and Watson were actually 611 feet long, while the Miller and Irvin were a few inches over 609 feet. All four ships had 60-foot beams and carrying capacities of slightly over 14,000 tons.

The new ships embodied a number of innovations that made them unique on the lakes at that time. All four had steam turbine engines that provided power directly to their propeller shafts through a reduction gear, unlike the previous turbines that drove electric motors, such as on the Str. T. W. Robinson. The directly-linked turbines, simpler and less expensive than the previous turbo-electric systems, soon became the preferred propulsion system for fleets operating on the Great Lakes. Officially, the Str. Hulst, the first of the four ships to actually go into operation, was the first vessel in the inland bulk fleet to have a direct steam turbine.

The vessels were also the first built with enclosed passageways running from bow to stern just below the main deck level and above the ballast tanks located between the cargo hold and the sides of the hull. The port and starboard “tunnels,” as they are now called, allowed crewmembers to move fore and aft during inclement weather without having to go out on deck. Before that innovation in design, a safety line was strung down the center of the deck from bow to stern cabin areas to aid crewmembers in moving fore and aft when the ship was taking waves across its deck. In some instances, crewmembers would also climb across the top of the cargo in the ship’s hold, a drier and safer alternative to using the safety line, but an option that wasn’t available if the hold was completely filled.

Before the installation of tunnels, it was not uncommon for deck personnel who lived in the forward cabins to be cut off from the stern for a day or two at a time when particularly severe storms made venturing out on the exposed deck dangerous. The seriousness of that situation is underscored by the fact that galleys on lake freighters are generally located at the stern, so when deck personnel were stranded forward they had to go without meals. The enclosed passageways were rapidly adopted as a standard feature on lakers!

The four new “tin stackers” were also the first ships on the lakes with hulls that were partially
welded. Up until that time, all steel fabrication on the ships was done with rivets, which added significantly to a vessel’s weight and reduced its carrying capacity by a like amount. As welding techniques improved, the use of rivets declined.

The **Str. Irvin** was designed to be the flagship for the Pittsburgh fleet. It had an extra deck of cabins forward, called the “Texas deck,” which contained accommodations for company VIP’s and guests. The luxurious staterooms on the Texas deck were richly panelled in walnut, trimmed with gleaming brass, and rivaled the accommodations found on the grandest passenger ships of the period. The passenger quarters also featured an observation lounge with a spectacular view and a private galley and dining room. When passengers were aboard, the normal working crew of thirty-six was augmented by a guest cook, guest waiter, and guest porter, who were responsible for tending to every need of the VIP’s during their voyage aboard the *Irvin*. Diversion from the normal monotony of a trip on the lakes was provided for guests by shuffleboard games on the deck and the construction of kites. Many trips included kite competitions, with prizes for the most kites on a single line and for the longest flight.

On the *Irvin*’s maiden voyage, the passenger quarters aboard the “Pride of the Silver Stackers” were occupied by the ship’s namesake, U.S. Steel President William A. Irvin and his wife, Gertrude. Irvin and his wife made many subsequent trips on the vessel, often entertaining important customers and other dignitaries.

The *Irvin* and the three other ships launched in 1938 joined a U.S. fleet that totalled 308 ships, operated by twenty-one shipping companies. The Pittsburgh fleet, with 79 ships, was the largest. The total single-trip carrying capacity for all of the U.S. boats on the lakes was 2,640,000 tons, and that figure rose steadily as new ships were added to replace smaller vessels that were no longer economical to operate.

When the U.S. was drawn into World War II in December 1941, Great Lakes shipyards retooled to support the war effort, building hundreds of vessels for the government. Wartime production at yards on the lakes included thirty-five N-3 cargo ships; eighty-two of the larger, diesel powered, C-1 cargo ships; twenty-eight 310-foot submarines; plus an assortment of frigates, landing craft, motor torpedo boats, and minesweepers. In an effort to assist the Great Lakes shipping companies in meeting the wartime demand for iron ore and other bulk products, the U.S. Maritime Commission also contracted for the construction of sixteen new bulk freighters. The “Maritime boats,” as they came to be known, were each 620 feet long, with 60-foot beams, and were capable of carrying about 16,000 tons on a 24-foot draft. Because of the wartime shortage of both turbines and gears, the ships were powered by older model steam reciprocating engines, rated at about 2,500 horsepower.

Six of the ships were built with cruiser sterns instead of the bulkier elliptical sterns normally used on lake freighters. The fantails of the ships extended far enough beyond the end of the keel to protect the rudder and propellers from damage if the ship should happen to back into a dock. The streamlined cruiser sterns also reduced resistance and improved flow conditions at the stern, which enhanced propulsion efficiency. They also reduced the tendency of the stern to squat, or drop down in the water, an important consideration because lake vessels operate in shallow channels much of the time.

While the Maritime boats were not exactly state-of-the-art in either size or propulsion, they were an improvement over many of the older ships operating on the lakes at the time. Great Lakes shipping companies were allowed to trade their older vessels with low carrying capacities to the Maritime Commission in exchange for the new Maritime boats on a ton-for-ton basis.

The Maritime ships served their owners well in the decades following the war. Although ships in the class set few records during their lifetimes, they were familiar sights around the lakes until the 1980s when the downsizing of the U.S. fleet sent many of them to the shipbreakers. Several are still around the lakes, primarily in reserve status in the event that cargo tonnages increase. One Maritime boat, the *George A. Sloan*, was converted to diesel propulsion during the 1984–85 winter lay-up period and is the only ship of its class still in active service on the lakes.

While the Maritime boats were larger than many of the boats operating on the lakes during the World War II years, they were overshadowed by the launching of the first of what became known as the “supers.” The first of the big ships, the steamers *Leon Fraser*, *Enders M. Voorhees*, and *A. H. Ferbert*, were built in
The *Str. Leon Fraser*, one of the 640-foot "supers" launched in 1942 for the USS Great Lakes Fleet, sat idle at the former American Ship Building yard in Lorain, Ohio from 1982 to 1989. In 1990 she was moved to Superior, Wisconsin, to be shortened 120 feet and converted into a cement carrier for Inland Lakes Transportation. The *Fraser's* bowthruster tunnel is clearly visible just above the waterline. (Author’s collection)
STEAMBOATS AND SAILORS OF THE GREAT LAKES

1942 for the Pittsburgh fleet. The supers were 640 feet long, with beams of 67 feet and carrying capacities of 17,700 tons, making them by far the largest ships operating on the Great Lakes. Equipped with steam turbine engines that were in short supply because of the war effort, the ships were rated at 4,000 horsepower. That pushed them along at 14 miles an hour, 2 miles an hour faster than the smaller Maritime boats and ships like the Irvin. Throughout the war years, the supers established new cargo and speed records for the lakes. Together with the Maritime boats, they were the workhorses of World War II, helping the industry keep pace with the record demand for bulk products needed to support the war efforts of the U.S. and its allies.

In the aftermath of the war, navigation again took a major leap forward as a result of military development of radar equipment. The first vessel on the lakes equipped with radar was the Coast Guard Icebreaker Mackinaw, the largest and most powerful breaker on the lakes (see chapter 8). The “Mac” was built during the war years to assist in keeping harbors and navigational channels open during the early spring and early winter sailing periods. In 1946, Inland Steel’s E. J. Block was the first commercial freighter to have radar installed as standard equipment rather than on an experimental basis, signaling the dawn of a new era for navigation on the lakes. Radar rapidly became standard equipment on all lakers. It dramatically reduced vessel collisions and resulted in an extension of the shipping season by about a month and a half, because ships were able to operate in spite of the inclement weather conditions that commonly exist on the lakes during early spring and early winter.

It should be noted that the Block holds one other first for the fleet on the lakes. Originally built in 1908, it was almost completely rebuilt in 1946, when it underwent conversion from steam to diesel electric propulsion. It was the first, and one of the only, diesel electric ships ever to sail on the lakes. Its diesel engine actually served as an electrical generator, providing electricity to operate the large electric motors that drove the ship.

The first new ships built after World War II were the Str. Hochelaga, owned by Canada Steamship Lines, and Inland Steel’s Str. Wilfred Sykes. The Hochelaga was launched in 1949, while the Sykes came out of American Ship Building’s Lorain yard in 1950. The Hochelaga was 640 feet long, with a beam of 67 feet, virtually identical in size to the supers launched during the war for the American fleets. On its first voyage, it broke a cargo record that had stood for twenty years by carrying 589,290 bushels of wheat. Its total carrying capacity was around 18,000 tons.

At 678 feet in length and with a beam of 70 feet, the Sykes became the largest ship on the Great Lakes. With a capacity of 21,700 tons, it established a new cargo record on its maiden voyage of the 1950 season. The Sykes also had the most powerful engines of any ship on the lakes, with steam turbines capable of producing 7,000 horsepower. Capable of operating at 16 miles an hour, it was the fastest ore carrier of the time, and the first steamship to use oil, instead of coal, for fuel.

Both the art and science of shipbuilding were pushed to new levels in the design and construction of the Str. Sykes. In the postwar period, it distinctly represented a new generation of bulk freighters and gave new definition to the label “super.” The evolutionary process that began with the Hackett seemed to finally have reached perfection in the Sykes. At the same time, its improvements over previous vessels were so significant that it was in a class alone. The Sykes was hailed as the prototype for the vessels of the future on the lakes, and wherever it went the flagship of the Inland Fleet made news.

The naval architects and marine engineers who worked on the Sykes were clearly looking to the future when they designed it. Personnel at Inland had made an economic survey of the iron ore trade and reached the conclusion that the best ship for their needs would be the largest and fastest vessel that yards on the lakes were capable of building that would still fit through the locks at Sault Ste. Marie. The Sykes was designed for a maximum draft of 25 feet, 6 inches, even though the channels connecting the lakes were at that time capable of handling vessels with drafts of only up to 24 feet, 6 inches. In that respect, the Sykes was designed for the future and would not be able to reach its maximum designed capacity until channels on the lakes were deepened.

When the Sykes was launched, the best designs that were used for lakers were capable of producing ships that could operate at a maximum of about 14.5 miles an hour, while the average for the fleet on the
Spectators lined the banks of the St. Clair River at Port Huron to watch Inland Steel’s 678-foot *Str. Wilfred Sykes* pass upbound on its maiden voyage, April 21, 1950. The largest ship on the lakes when it went into service, the *Sykes* embodied many unique design innovations. Converted to a self-unloader in 1975, it is now one of the smaller U.S. ships operating on the lakes. (Institute for Great Lakes Research, Bowling Green State University)

A progress photo of the construction of the *Wilfred Sykes* at American Ship Building in Lorain, Ohio, in early 1949. Ten weeks after the keel was laid, a section of the *Syke’s* midbody is well along, clearly showing the cargo hold, side tanks and double bottom. The tunnels that will run from bow to stern can be seen above the side tanks, blocked off with sheets of plywood. (Institute for Great Lakes Research, Bowling Green State University)
lakes was only about 11.5 miles an hour. The 7,000 horsepower produced by the Sykes’s two steam turbines, combined with improvements in hull design, allowed it to operate at the almost astonishing speed of 16 miles an hour when empty. That represented a 13 percent improvement over the next fastest ship on the lakes, and a 39 percent increase over the average for the Great Lakes fleet.

In terms of both speed and carrying capacity, it was obvious to observers that the Sykes would not soon be outclassed. At the same time, people in the industry marvelled at the extent to which designers and builders of the Sykes were able to perfect virtually every aspect of the design that had gradually evolved over a period of more than nine decades on the lakes. The Sykes had the boxy, flat-bottomed hull that had always been a unique characteristic of the lakers, dictated by the shallow channels of the lakes and the desire of owners to maximize the tonnage their vessels could haul. From the standpoint of maximizing the carrying capacity of a ship, the best possible design would be a cube, or block, similar in shape to a shoebox, with no rounded edges. A hull in the shape of a shoebox would not move through the water very well, however, so some curvature of the hull is necessary at both the bow and stern to reduce the hull’s resistance to the water. The extent to which a ship achieves the carrying efficiency of a shoebox is reflected in its block coefficient. The block coefficient of a shoebox would be expressed as 1.00, indicating a perfect cube. On the lakes, vessels built prior to the Sykes had block coefficients ranging from a low of about 0.800 to a high of 0.875, meaning their hulls would fill from 80 percent to 87.5 percent of a perfect cube of their length, width, and height. While it was usually necessary to reduce the block coefficient in order to achieve higher speeds, designers of the Sykes were able to make significant improvements in its speed while maintaining the block coefficient at 0.875, the top of the range found on the lakes.

The midsection of the Sykes consists of three cargo holds separated by screen bulkheads that run transversely across the ship and aid in distributing cargo. The midsection is virtually a perfect cube, except for a slight curve where the sides and bottom of the ship meet. The lines of the bow are similar to those used on the Maritime boats built during the war. The bow cross-sections are basically U-shaped and do not flare outward at the top as they would on an ocean vessel. While a flared bow aids in rolling seas away from the ship, it is impractical on lakers primarily because of the design of the loading docks. Anything sticking out from the flat sides of the ships is likely to come into contact with the structures on the loading docks, which are often set back only four or five feet from the dock face.

Ocean vessels also normally have raked stems, or bows that jut forward, to better cut through the water. While the stem on the Sykes is raked more than those of most previous lakers, it is much more perpendicular than those of saltwater ships. This is because ships on the lakes often find it necessary to turn around alongside docks by stemming. Stemming involves holding the ship’s bow against a dock while the stern is swung around. Any dramatic rake would cause the bow to foul on dock structures when stemming.

The Sykes is fitted with a cruiser stern similar to those used on some of the Maritime boats. Model tests run before the design of the Sykes had shown that cruiser sterns cause less resistance and improve the flow of water to the propeller, while reducing squat. The overhang of the fantail also protects the rudder and propeller when the vessel is maneuvering in congested waters.

In the Great Lakes tradition extending back to the Hackett, the Sykes has its pilothouse and accommodations for the deck crew forward. In addition, there are four staterooms for guests and a lounge and observatory on a Texas deck, located above the main or spar deck and below the captain’s stateroom and pilothouse. On the main deck and poop deck aft are crew accommodations for engine and galley personnel, and galley and dining facilities, including a separate owners’ dining room for use by company officials and guests.

The engine room is located at the stern and encompasses three decks below the main deck level of the vessel. Forward are two decks below the spar deck. The first of these contains accommodations for some unlicensed personnel from the deck department, a laundry room, and storage spaces for equipment used by the deck department. The second, or lower, deck provides some work area, although most of the space is devoted to ballast tanks.

While retaining the basic traditional lines of lake freighters, the designers of the Sykes at-
tempted to modernize the appearance as much as possible. For the most part, this involved subtle modifications to the hull and superstructure that made the appearance of the ship more aesthetically pleasing to the eye. The most significant manifestation of the owner’s interest in aesthetics is the smokestack, which is much larger and more streamlined than on most lakers, where the stack is considered merely a pipe to carry away boiler gases.

Designers also sought to eliminate all superfluous details that tend to give the decks of lakers a cluttered appearance. Ventilators and storage tanks normally found atop the stern were designed in such a way that they became part of the basic structure of the stern, rather than appendages to it. Masts atop both the bow and stern were given a sleek appearance and built to be self-supporting, eliminating shrouds and stays that are normally used. The owners even agreed to a new painting scheme, which was eventually used on all Inland vessels, that further enhanced the ship’s appearance. Bands of color extending the length of the *Sykes* just below deck level add to its streamlined look.

Structurally, a 5-foot to 6-foot high inner bottom for water ballast extends the full length of the *Sykes*, with additional ballast tanks located along the sides of the hull for most of the length. Above the ballast tanks that are sandwiched between the hull and cargo holds are passageways, or tunnels, for use by crewmembers and passengers during inclement weather.

The bulkheads between the sidetanks and the cargo holds are sloped inward at the bottom to aid in distributing cargo and to keep cleanup time to a minimum when unloading. Because it was intended that a bulldozer or front-end loader would be lowered into the cargo hold to assist in cleanup when unloading, large openings were left in the screen bulkheads that separate the cargo holds so the heavy equipment can move from one hold to the next.

Both longitudinal and transverse framing was used in construction of the *Sykes*. Overlapping seams of the hull’s outer shell were riveted, as were the deckhouses and connections to stringers. To reduce weight and speed construction, welding was
used throughout most of the rest of the ship, including all of the internal structures and butt joints in the hull plating. Steel plating used on the Sykes ranged from 3⁄8 inch to about 1 1/2 inches in thickness, with the heaviest plating used on the exterior of the hull, particularly from the waterline to the deck, the areas where the hull comes in contact with docks. Hull plates were also overlapped and riveted to increase the strength of seams in vital areas. Although generally lighter steels were used inside the hull, areas of the cargo hold that are subject to damage by unloading equipment have been reinforced with thick plates of special steel alloys to help minimize damage.

To further increase the watertight integrity of the ship, both the forepeak and the engine room were separated from the midbody by watertight bulkheads. The bulkheads are fitted with watertight doors with automatic closers designed to resist water pressure even when they are not properly dogged shut. The side tanks of the Sykes, which protect the cargo hold from flooding if the sides of the hull are holed, were made a minimum of 8 feet wide, rather than the 5 or 6 feet normally found on lakers. This means that the side of the hull would have to be breached to a depth of at least 8 feet before the holds would be flooded.

The Sykes was fitted with nineteen hatches, each of which is 44 feet wide and 11 feet long, spaced on 24-foot centers. Hatch coamings are 24 inches high, 6 inches more than is required, to reduce the chance of a crewmember falling into an open hatch while working on deck. Hatch covers are fitted with one-piece hatch covers that can be dogged down securely with self-locking, toggle-type clamps; they can be dogged down or released by a simple upward or downward motion of a special lever used by deckhands. About fifty clamps secure each hatch cover. Hatch covers are moved by a hatch crane that operates on tracks that run the length of the main deck on both sides of the hatches. A 25-horsepower electric motor propels the crane, while the two lifting hooks operate off a 10-horsepower motor.

The owners of the Sykes wanted crew accommodations that would remain adequate throughout the life of the ship. Private staterooms were provided for all licensed officers, with double rooms for unlicensed personnel. Each room has a private bathroom, and the captain and chief engineer have private offices adjoining their staterooms. Recreation rooms were included in both the forward and after cabin areas for the use of crewmembers during their off-watch hours. Stairways and passageways were also designed so that it is possible to go anywhere on the ship without having to go outside, an important convenience during foul weather.

The Sykes’s steam boilers were designed to burn Bunker-C fuel, a heavy oil, rather than coal, and it was fitted with wing tanks in the engine room that have a combined capacity of 165,000 gallons. The size of the bunkers provides a cruising range of 4,500 miles; the round trip from Inland’s mills at Chicago to Duluth and back is only about 1,700 miles. The size of the fuel reserve provides a generous margin of safety in case the ship must ride out a storm.

Before selecting a propeller for use aboard the Sykes, designers conducted extensive tests of both solid and built-up propellers. Solid propellers are cast as a single unit, while the blades on built-up propellers can be removed from the hub that attaches to the vessel’s drive shaft. A built-up model with blades cast from an aluminum, manganese, and bronze alloy was chosen for use on the Sykes because ships on the lakes frequently suffer propeller damage as a result of striking ice, docks, or the bottoms of channels. With the built-up propeller, damaged blades can be changed without drydocking the ship, saving both time and money. The imposing propeller chosen for use on the Sykes has four blades and a diameter of 18 feet, 6 inches.

Just aft of the propeller is the ship’s large slab rudder, several feet taller than the propeller and approximately 8 feet wide. The rudder is attached to a heavy rudder post that connects to the keel skeg below the propeller, protecting the bottom of the propeller. The rudders on Great Lakes ships differ dramatically from those used on saltwater vessels, both in their size and the bulk of their supporting structures. The massiveness of the rudders makes them much sturdier and less likely to be damaged if they bang against a dock or the side or bottom of a river or harbor channel, as often happens. Because of the size of the rudders used on Great Lakes freighters, they are much more maneuverable than ocean vessels, which generally have to use tugs to assist them in maneuvering in confined waters. Rudder size on saltwater ships is limited because of the extreme sea conditions they commonly encounter on
the oceans. A rudder the size of those used on the lakes would present too much surface area to a following sea, making it extremely difficult to steer the ship and increasing the risk of wave damage to the rudder.

The Sykes was fitted with two 12,000-pound bowser anchors that fit inside special anchor pockets on each side of the forward bow. The pockets are designed to carry the anchors inboard so they cannot foul on docks. Each forward anchor is fitted with 540 feet of 2½-inch diameter forged alloy steel chain. The electrically driven anchor windlass is located in the ship’s forepeak on the main deck level. The Sykes also carries a single stockless stern anchor of 10,000 pounds, fitted with 540 feet of 1½-inch diameter steel chain. The stern anchor windlass is on the main deck, aft of the stern deckhouse.

A total of six 50-horsepower electric mooring winches were installed aboard the Sykes, a configuration that has become standard for lake freighters. Two are located at the forward end of the deck, two at the aft end of the deck, and one each in the forepeak and on the fantail. Control stations for the winches are located both fore and aft on each side of the ship. The 1½-inch plow steel mooring cables are paid out through special universal mooring chocks located at the ship’s side adjacent to each winch. The sheaves in the chocks rotate within the frames on ball bearings so the chocks will automatically rotate to accommodate the angle of the mooring cables from the hull to the dock, preventing excessive strain and wear on the cables.

Lifesaving equipment installed aboard the Sykes consisted of two thirty-one-person lifeboats and one fifteen-person raft. The boats are carried on davits located on the port and starboard sides of the after poop deck and can be raised and lowered by power winches. The raft was stowed on the roof of the pilothouse in a rack that would allow it to float free if the ship sank. That raft has since been replaced by a number of inflatable life rafts stowed in containers on deck.

The ultramodern Sykes, the “ship of the future,” joined a U.S. fleet on the lakes that included 260 bulk freighters operated by twenty-five companies. The average carrying capacity of the ships in 1950 was just 11,300 tons, ranging from a little over 6,000 tons for the smallest vessels to 21,700 tons for the Sykes.³

The demand for iron ore was increasing significantly when the Sykes made its long-awaited debut, and many fleets scurried to put new vessels into service. Shipyards soon had a backlog of orders on their books, so several fleets opted to have surplus ocean vessels converted for use on the lakes. Cleveland-Cliffs led the way with the conversion of the Victory, the first refurbished salty to be brought onto the lakes. Three C4-S-A4 cargo ships were also converted for Nicholson-Universal Steamship Company, which was 70 percent owned by Republic Steel. Two C4-S-B2 fast troop transports were converted, one each for Hanna Mining Company and Amersand Steamship Company. The Amersand vessel was partially owned by Boland & Cornelius, the fleet that would operate the new ship.

Conversion of the ships involved lengthening them, constructing new, fuller bows, replacing their midship pilothouses with new bow pilothouses, and overhauling their steam turbine propulsion machinery. The retrofitted vessels ranged in length from 585 to 714 feet, with Hanna Mining’s new Str. Joseph H. Thompson, the first ship on the lakes to exceed the 700-foot mark.

Because they were too long to transit the locks on the Welland and St. Lawrence, the new ships made their way to the lakes as the Victory had done, being towed unceremoniously up the winding Mississippi and through the Illinois Waterway and Ship Canal to Lake Michigan. With its conversion completed in just ninety days, Cliffs Victory entered service on the lakes on June 4, 1951. The Tom M. Girdler went into operation at the end of the 1951 season, while the Charles M. White, Troy H. Browning, and Joseph H. Thompson began their service on the Great Lakes during the 1952 season. The McKee Sons, which also underwent conversion to a self-unloader, was not ready to make its maiden voyage on the lakes until 1953. Because the converted vessels were half laker and half ocean vessel, they were often referred to as “hermaphrodites.” The word originally referred to a plant or animal that had both male and female sex organs, but the term had previously been used in marine circles to refer to a type of sailing ship that was square-rigged forward and schooner-rigged aft.

The Girdler, White, and Browning had been converted to haul iron ore to Republic Steel’s mill up Cleveland’s shallow and winding Cuyahoga River. Thus they had relatively modest depths and drafts,
over 3 feet less than that of the Thompson, and they could carry only about 14,000 tons. Because of their shallow drafts, the three ships could not later be economically lengthened, and when the recession hit the industry in 1980, they were among the first to be sent to the shipbreakers for scrapping.

The Cliffs Victory, which had been lengthened to 716 feet in 1957, survived a little longer, but when Cleveland-Cliffs got out of the shipping business in late 1984, the Victory was sold to a Liberian shipping company, ostensibly for service in the Asian trade. By 1987, however, it too had gone to the shipbreakers in the Pacific, far distant from the familiar waters of the Great Lakes. During its more than three decades on the lakes, the Victory cultivated a reputation as one of the fastest of the bulk carriers, capable of speeds of up to 20 miles an hour when empty. It was also the most distinctive ship in the Great Lakes fleet. With one cargo hold aft of the stern deckhouse, it looked for all the world like it had midship cabins, or as if a long tail had been tacked onto an otherwise normal looking ship. The Victory's distinctive appearance made it a favorite with boatwatchers around the lakes.

Captain Henry “Bud” Zeber, who was master of the Victory for about seven seasons said: “She was one of the best sea ships on the lakes because of her sharp, flared bow, but she was a mean one for rolling. She was also a hard handling ship around docks,” he added, “because of the flare of her bow.” Zeber noted that even at the end of a long and distinguished career, the Victory had made a place for itself in the record books—as the last of the famous Victory-class to see service, a distinction it had held for many years.

The self-unloading McKee Sons, 633 feet long, survived the recession, but has operated little since 1980. The Thompson, originally the longest of the converted salties, also saw limited service after 1980, spending most of its time laid up in a slip on
The USS Great Lakes Fleet's Str. Philip R. Clarke downbound on Lake St. Clair with a cargo of limestone. The 767-foot Clarke is one of the eight AAA-Class boats launched on the lakes during the Korean War. Originally 647 feet long, all but one have since been converted to self-unloaders and are still in service. (Author’s collection)
the Detroit River. In 1983, it was sold to Upper Peninsula Towing Company of Escanaba, Michigan, for conversion to a barge. While the converted ocean vessels were never completely accepted by many people in the Great Lakes industry, they did provide their fleets with additional carrying capacity when they badly needed it. With the coming of the Korean War, fleets on the lakes had to scramble to find additional ships to meet wartime demand for iron ore, and the converted salties were an innovative and generally successful solution to the problem.

Great Lakes shipyards produced eleven new ships during the Korean War, while three other new bulk freighters were built for Great Lakes service at East Coast shipyards and brought up the Mississippi. The ships ranged in length from 626 to 690 feet. Ten of the ships had 70-foot beams, while one, the self-unloader John G. Munson, had a 72-foot beam. Their cargo capacities ranged from 17,800 tons to about 22,000 tons. All were built with oil-fired steam turbine engines.

As the nature of the Great Lakes industry changed, the ships built during the early 1950s were upgraded by their owners to keep pace with the demands of the industry. When tonnages on the lakes rose to record highs during the 1970s, most of the ships were lengthened, or “stretched,” by the addition of new midbody sections that increased their carrying capacities. Eventually, all but three of the fourteen ships were lengthened. One of the three that did not get stretched was the Str. Ernest T. Weir, which at 690 feet had been the longest of the original ships. Most of those lengthened are now 767 feet long.

While only one of the original fourteen had been launched as a self-unloader, all but three of the other vessels have since had self-unloading systems installed. Most of the conversions occurred during the early 1980s when the dramatic drop in tonnages on the lakes gave a decided advantage to the versatile self-unloaders that are not limited in the ports they can serve. Most of the ships have remained in active service and are among the only traditional lakers, with forward pilothouses, still in operation by the U.S. fleet.

The Str. George M. Humphrey, built in 1954 for Hanna Mining Company, was the first ship on the lakes with a 75-foot beam. The Humphrey also had the largest hatches on the lakes, being 48 feet long and 17 feet wide. The hatches continued to be spaced on 24-foot centers, except over the three screen bulkheads that separated the cargo holds. There the spacing was 36 feet, to provide an area of open deck large enough to stack hatch covers that had been removed for loading or unloading. The Humphrey was 678 feet long and had a carrying capacity of 22,605 tons. Shortly after launching, it established a cargo record that would stand on the Great Lakes until 1960.

With the opening of the St. Lawrence Seaway in 1959, allowing large ships to pass from the Great Lakes to the Atlantic Ocean for the first time, several U.S. and Canadian companies launched “maximum Seaway-size” freighters. The first of the new ships built to the dimensions of the Welland and St. Lawrence locks was the Str. Edmund Fitzgerald, owned by Northwestern Mutual Insurance Company and operated by Columbia Transportation. The “Fitz,” as it was known, was 729 feet long, the “Queen of the Lakes” when launched in the fall of 1958, just a few months before the opening of the Seaway (see chapter 7). In 1959, the Canadians followed with the launching of the Str. Menihek Lake, owned by Carryore Limited, a Canadian subsidiary of Hanna Mining. At 715 feet in length, it was the largest vessel in the Canadian fleet.

Opening of the Seaway system had a dramatic effect on Canadian shipping on the lakes. From the opening of the Seaway in 1959 until the end of 1969, eleven years, Canadian fleets launched sixty-nine new ships. By comparison, U.S. fleets added only ten ships during the same period, and five of those were converted saltwater vessels.

Iron ore tonnages on the lakes, the staple for the U.S. fleet, fell steadily in the years following the Korean War. While almost 96 million tons of ore was shipped in 1953, less than 61 million tons moved in 1961. Tonnages climbed slowly throughout the rest of the 1960s, the result of both the growing war in Vietnam and the health of the U.S. auto industry. The U.S. tonnages could, for the most part, be handled by vessels that were in operation on the lakes before the sixties. Few U.S. ships were involved in trade out the Seaway. On the Canadian side, however, the opening of the Seaway created a boom for shipping companies. For the first time in history, the
A saltwater ship passes the Str. Edward B. Greene in the St. Marys River. The salty's bulbous bow and cargo handling cranes are clearly visible. The Greene was a AAA-Class vessel, built during the Korean War for Cleveland-Cliffs and later lengthened and converted to a self-unloader. It has since been purchased by Interlake Steamship Company and operates today as the Kaye E. Barker. (Author’s Collection)
province of Ontario, the most industrialized of all Canadian provinces, was connected by water to Quebec, the Maritime Provinces, and the Atlantic Ocean by a seaway capable of handling full-size ships.

Before the opening of the Seaway, the Canadian fleet consisted largely of small canallers, but the companies began to rapidly shift to maximum Seaway-size bulk freighters after 1959. The boom in Canadian fleet expansion was fueled by exponential increases in outbound movements of Canadian grains and inbound movements of Canadian ore from mines in Quebec and Labrador.

Grain shipments out the Seaway on full-size lakers resulted in sharp reductions in transportation costs for Canadian grains moving onto world markets. As a result, Canada began to carve out a greater share of the international grain trade, resulting in still more grain that had to be moved through the Seaway. Thunder Bay, Ontario, located at the head of Lake Superior and connected by railroads with the grain-producing provinces on the Canadian plains, became the largest grain port in the world. Grain tonnages shipped on the lakes increased from 13 million tons in 1959 to 25 million tons in 1966, with most of the increase moving aboard Canadian vessels to mills or storage facilities on the Seaway.5 The opening of the Seaway also cut the costs of shipping iron ore from Quebec and Labrador to U.S. and Canadian steel mills on the lakes. Iron ore became the primary backhaul cargo for Canadian bulk freighters carrying grain out the Seaway, making the trade route a lucrative one for the Canadian fleets.

The opening of the Seaway completely revitalized the Canadian bulk fleet. Virtually all of the Canadian ships built after 1959 were constructed to maximum Seaway-size, which was eventually set at 730 feet. Even today, no ships in the Canadian fleet exceed the maximum sizes allowed on the Seaway, a testimony to the importance of that trade route to bulk fleet operators.

While there was little expansion in the U.S. bulk fleet from 1959 through 1969, the period is significant for several reasons. First, it was primarily during the 1960s that bowthrusters were installed on most of the U.S. bulk freighters. The thrusters are mounted in a 5-foot to 6-foot diameter tunnel that runs transversely through the ship’s hull in the forepeak, just below the waterline when the vessel is empty. At each end of the tunnel is a propeller mounted parallel with the ship’s longitudinal centerline. The propellers are powered by a diesel engine of about 1,000–1,500 horsepower that is located in the forepeak. The thrusters are controlled from the pilot-house and can be used to move the bow of the ship to the left or right when docking or maneuvering at slow speeds. Thrusters further increase the maneuverability of the lakers, generally eliminating the need for the freighters to be assisted by tugs when operating in confined rivers or harbors, and reducing damage to hulls caused by collisions with docks. They proved so popular with vessel personnel that there are now only a couple of ships left on the lakes that do not have thrusters.

The 1960s also marked the beginning of the end for steam propulsion on the Great Lakes. The last ships in the lakes fleet built with steam engines were launched in 1960, although five saltwater steamers were converted for use on the lakes between 1961 and 1965. In 1967, the Canadians launched their last steam vessel for service on the lakes. Since 1967, all ships added to the U.S. and Canadian bulk fleets on the Great Lakes have been powered by diesel engines. Diesels are cheaper to build than steam engines, and they require significantly fewer personnel to operate them. Those savings more than offset the higher fuel and maintenance costs associated with diesels.

The year 1969 marked the one hundredth anniversary of the unique Great Lakes bulk freighter. When the Str. Hackett was launched in 1869, it combined steam and sailing vessel technology of the time into a new type of ship that immediately proved so well suited to hauling bulk cargo that the basic design survived for one hundred years. Even though the Great Lakes industry has always been proud of its heritage, the centennial of the launching of the Hackett went largely unobserved on the lakes. Naval architects and marine engineers were already at their drawing boards designing a new class of ships that would double the carrying capacity of any vessel then operating on the lakes. At the same time, they were beginning to seriously question the efficiency of the traditional laker design that had been developed a century before by Captain Eli Peck of Cleveland.
Notes

5. Ibid.