

# INLAND SEAS<sup>®</sup>



**QUARTERLY JOURNAL  
OF THE GREAT LAKES  
HISTORICAL SOCIETY**

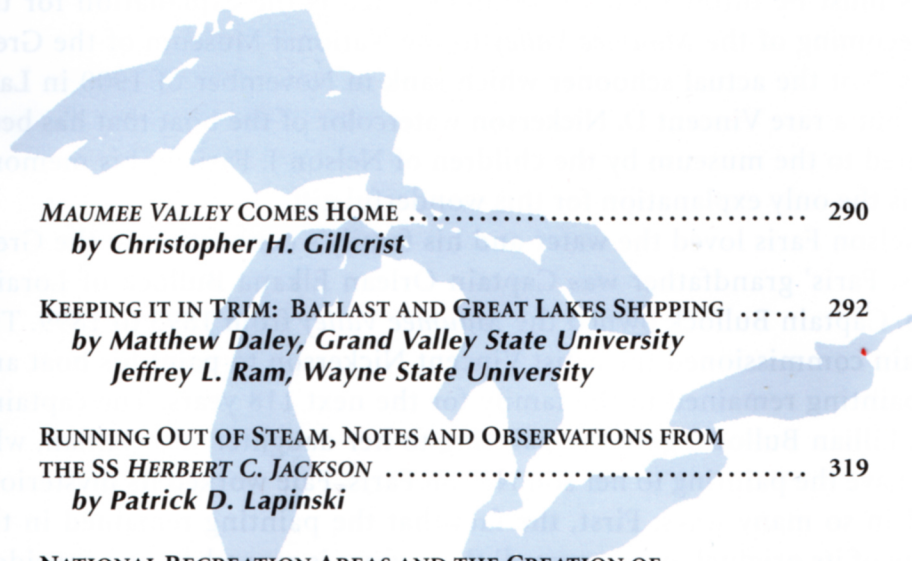
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## RUNNING OUT OF STEAM

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*Notes and Observations from the SS Herbert C. Jackson*  
by Patrick D. Lapinski

“If the steamship were to pass entirely, the men who have grown up in them would be as reluctant to transfer their services as, a century ago, their forebears were reluctant to leave sail for steam.”  
G. Gibbard Jackson, 1928

I woke up early, stepping outside to a balmy, damp morning on the outskirts of Marquette. The pre-dawn motel parking lot already had a couple of smokers huddled under an awning while a tousled, heavysset man walked a small dog in an island of grass between the parking lot and the highway. The air was heavy with the odor of rotting leaves. Beyond, in the distance, it was hard to tell the sky from the water as the horizon blended the steely, undulating water of Lake Superior with a dark curtain of cloud suspended above it into an imperceptible expanse of nothingness. This is really warm for mid-October, I thought, heading back to gather the rest of my belongings and my traveling companions, but now is not the time to be superstitious.



On the Detroit River heading for Marquette. Detroit skyline on the left, Windsor on the right.

Sometime during the morning, the steamship *Herbert C. Jackson* arrived at the Canadian National ore dock at Marquette's Upper Harbor, often referred to as Presque Isle harbor. We're on the opposite end of town so I turn onto the highway from the motel, headed toward the downtown district. Marquette made its name as a lumber and ore shipping port in the late 1800s, and over a century later has grown to become one of the largest cities in Upper Peninsula of Michigan.

At the edge of downtown I turn right, coasting down a block long incline before taking a left onto the road that follows the contours of the lake along what is now a landscaped civic park and marina. This is where it all began in the fall of 1853 when the first "large" shipment of iron ore from Lake Superior, 152 tons destined for the Sharon Iron Company in Sharon, Pennsylvania, was loaded by hand into wooden barrels. The skeletal ribs of an old concrete ore dock jut out into the small embayment, its connecting rail trestle long ago removed. We are on the path of history here, I think as I peer out into the murky landscape. It's just a little hard to see it right now.

The road curves behind the old Coast Guard station, now a maritime museum. Here, the shoreline widens where a large, exposed outcropping of volcanic rock rises out of the lake, forming a naturally protective barrier for the lower harbor from the northwest winds. It is on this point of rock that the current Marquette lighthouse was built atop the small promontory in 1866, its light still an active beacon.

Rain splatters hard against the windshield, the darkness of the asphalt sucking up any illumination from my headlights. Beneath clumps of trees the rain presses the wet reds, yellows, oranges and browns of autumn flat against the black roadbed. A few miles down the road the ore dock comes into view, distorted in the rain and gloom into a long rectangular shape on the horizon. There is no ship in sight. I take it on faith that they are on the opposite side of the dock.

There's nothing very glamorous about catching a boat on the Great Lakes, at least not this morning. We don't have a cruise director funneling us into a queue for boarding, just a closed steel gate which precipitates (no pun intended) a brisk walk from the car to a cinderblock guard shack. Long gone are the days of just showing up and hauling everything down the dock without a care in the world. The advent of Homeland Security and a heightened sense of security have changed all that. In the past ten years, an infrastructure of guard posts, fences, cameras, and personal identification cards has become part of the here and now. The ideals of personal freedom and what it takes to protect them is a touchy subject, particularly among many mariners, so not only do I tread warily around this topic, I avoid it when possible.

Stepping inside the shack I am surprised to find a security guard who works for the railroad. The ore docks in Minnesota and Wisconsin have farmed out their security to private firms, those docks usually manned by ruddy-faced, uniformed college kids or retired workers. The room is small, lit by a low-watt desk lamp and a computer screen. Along with the red and amber lights of charging batteries and radios, it's a dry, warm space.

As we exchange greetings, it seems like a shame to roust the man out of his warm cocoon, but soothing ambience or not, it's time to get the hardest part of the day out of the way. We're here to document the operation of the last steamship in the century-long history of The Interlake Steamship Company and I have a car full of bags, cameras, computers and personal creature comforts that are a part of my traveling retinue idling outside the gate. I head back to the car as the guard dons his rain gear. Soon we're inside the fenced perimeter, quickly shuttling everything inside the shack until the car is empty and parked in a muddy, rain soaked field across the road from the dock.

We've done our part, so now it's time for the guard to do his work. There are several steps involved in boarding a vessel, the first of which is getting onto the "list," the official roster of crew, vendors, guests and service people that is faxed or emailed from the ship to the dock prior to the vessel's arrival. This can sometimes be a real wildcard because if the mate forgets to put your name on the list, then the guard has to radio the ship, and if they're busy loading, they don't always answer the phone. In this case, because we are guests of Interlake, there's no need to worry.

I've hardly paid any attention to the ship we're about to board, other than to notice that it is moving slowly away from us, shifting back along the dock. Looks like we'll be walking a bit further to get on. With everything piled onto the concrete floor and a small plastic chair in the corner of the room, the fluorescent ceiling lights come on, our dilated pupils screaming No! and making us all look wet, tired and anxious. Once we are confirmed on the list, we provide our identification, which in this instance is either a driver's license or a TWIC card. The TWIC (Transportation Workers Identification Credential) is a government issued card embedded with chip technology that serves as one of two required forms of identification for mariners, the other being their merchant mariner credential (MMC). The guard radios the mate on the *Jackson* to let him know that we have arrived. Since the boat is being repositioned beneath a new set of chutes, it'll be a little while before they can send someone to help us with our gear.

Providing identification is only one part of the check-in process. The second is submitting to a search of our belongings, an invasive procedure



Moving through the MacArthur Lock. Nate Chesebro on the wall, Mike Ojala on the boat.

we willingly agree to (not that we have a choice). A bad attitude or even a sense of urgency can make this a very painful process. One by one we pull zippers and unlatch cases, talk about our beaten cameras and what a pain in the butt digital technology is because it requires so much more peripheral equipment than a simple camera and rolls of Kodachrome that I carried when I first started doing this over three decades ago. The search is also designed to stifle the flow of contraband, which primarily consists of bringing alcohol aboard a vessel. There is a strict, zero tolerance of alcohol in effect, a legacy from the grounding of the supertanker *Exxon Valdez*.

We have now been joined by one of the ship's crew, back from his run up the street. He waits patiently in his yellow rain slicker and hardhat while our bags are checked. I've lost track of the time, but the sky is brighter, the rain has stopped, and by the time our bags are cleared, Nate Chesebro, an AB from the *Jackson*, is on his way to lend a hand. It's time for our adventure to begin. We commandeer an unwieldy flatbed cart from a metal lawn equipment storage shed behind the guard shack and with the diligence of a Greyhound baggage clerk we haphazardly transfer our belongings as quickly as we can to the cart, our shoulders and backs, gearing up like an expedition to the summit of Everest.

To reach the ship we take a paved walkway underneath the trestle that leads to the interior of the ore dock. Walking alongside the dock where the

ship is moored is forbidden, not smart even if it were allowed, and here, not practical. The Marquette dock has a narrow concrete apron beneath the loading chutes, enough room for crew to walk, but not much more than that. Besides, it's much easier taking the nice asphalt path. I recall this being a wooden walkway on my first visit here years ago. The CN docks in Duluth and Two Harbors have steel-grated catwalks that straddle the center of their docks about a half story above the ground. Using a cart there is impossible, especially in Duluth. About a quarter of the way down that dock, just past an abandoned, grime-layered phone booth reminiscent of the Chernobyl landscape, an additional overpass straddles the conveyor belt running from an unloading hopper to the storage field.

The Presque Isle ore dock and trestle were erected between 1911 and 1912 for the Lake Superior and Ishpeming (LS&I) Railroad. Construction of the Presque Isle dock combined the efforts of the railroad and several regional engineering firms, each applying their structural expertise to the project. The submerged timbers of the upper harbor's original 1896 era wood-framed ore dock are located a short distance to the east. You'd find the same thing here if you could magically scrape this dock off the surface of the water because beneath it is a wealth of Oregon fir driven twenty feet into the lake bed. Over 9,000 of these timber pilings form the base of the dock, serving as giant shock absorbers for the 9-foot-thick concrete cap atop which sits the dock we are about to walk beneath.

Upon our approach, my eye was drawn to the ore dock itself, a physically imposing structure of concrete extending 1,200 feet into Lake Superior. The top of the dock, 75 feet above ground, is as flat as an aircraft carrier, its 54-foot wide surface housing four sections of track running the length of the dock for the movement of ore laden trains. I've been looking at ore docks for my entire life and they haven't lost their sense of enormity; gazing directly up can be a dizzying experience, akin to standing at the base of a six-story building. I have come to appreciate their simplistic design and functionality.

While the dock itself is physically astounding, the bridge approach is impressive in its own right. As we arrived at the dock we drove beneath one of its towering supports, called a "bent," that straddles the road leading out to Presque Isle. Driving towards it is a catalyst to my imagination, transporting my waking brain to the entrance of Jurassic Park, or in another leap to a fortress built to forbid the likes of King Kong himself. But it's not Hollywood, it's Marquette! The bridge measures 600 feet in length, rising on a low grade 70 feet above the roadbed to the height of the dock. Its design is typical of rail trestles and industrial bridges of the day, put up in

erector set fashion using steel girder plates supported by angular posts mounted atop stone and concrete blocks.

By the time we traverse the walkway down the center of the ore dock, the first run of ore has been made aboard the *Jackson*. I take one last look before ascending a few narrow steps to the dock apron. I can almost feel the locomotives and ore cars moving overhead like I did as a kid passing beneath the Great Northern trestle along Highway 2 in Superior. The rumble was the deep, heavy sound of something massive moving overhead, the weight of its passing sending tremors and vibrations into the pit of my stomach. As we move beneath the dock in Marquette, this feeling of familiarity awakens a long dormant memory of my Uncle Rollie, a locomotive engineer who lived in a small, one room shack beside the ore trestle in Superior's Allouez neighborhood. The windows were translucent, filtered with a red and brown layer of grime caused by the iron ore dust. The smell of his musty, tobacco-saturated wool clothing, along with the acrid odor of kerosene and fried food encased in his small wooden home left an indelible impression on me. No one in his right mind would live like that nowadays.

As we step onto the dock apron, I could probably stand with my arms outstretched and touch both the ship and the dock at the same time, we're that close. Instead, we form a human luggage brigade, handing our bags one at a time to the youthful Chesebro to wrap each item with a rope line lowered from the ship, nervously trusting his skill to ensure nothing falls into the narrow gap between the dock and the hull. This is always an anxious moment for me with my cameras. I usually throw the shoulder strap over my head and climb to the deck with my bag slung behind my back, but here I hand my pack to the deckhand to wind the line around its exterior like all our other belongings. Because the dock is both narrow and tall, the ladder down from the *Jackson* is nearly horizontal, which could cause my camera bag to swing loose from my back, offsetting my balance. I defer to safety as I leg it over a mooring cable, my boot landing firmly on the second rung of the ladder and climb ice crevasse style to the deck while my camera is hoisted beside me, arriving safely on deck seconds before I do.

After almost two months of delays and schedule changes, we have finally arrived at our destination. Both of my adult sons are accompanying me on this trip. In their own ways, each has grown up around the boats, learning to appreciate an industry that not everyone gets to see close up. Over the years they have been my traveling companions on many an adventure, but I think this may be the first time our schedules have worked out so that we could all ride together. I believe we would all sleep in the dunnage



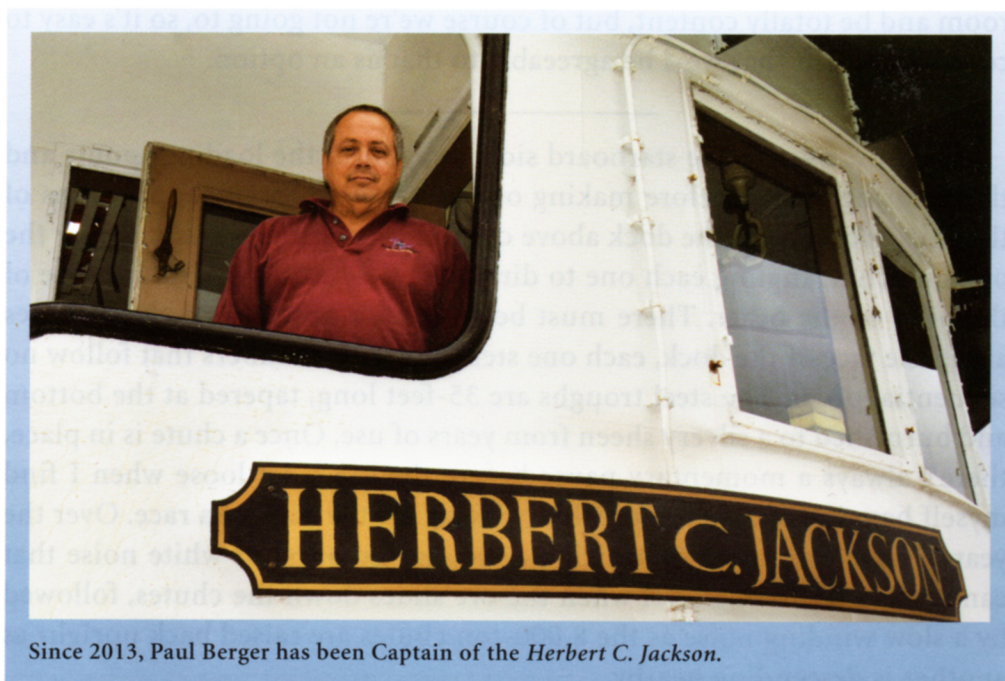
room and be totally content, but of course we're not going to, so it's easy to convince myself that we'd be agreeable to that as an option.

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We cross over to the starboard side, away from the loading spouts and the mooring cables, before making our way toward the forward cabins of the ship. Workers on the dock above continue lowering the chutes over the open hatches, angling each one to direct the flow of the ore to one side of the hold or the other. There must be close to a hundred of these chutes along the face of the dock, each one stenciled with numbers that follow no sequential order. The steel troughs are 35-feet long, tapered at the bottom and burnished to a silvery sheen from years of use. Once a chute is in place, there's always a momentary pause before the ore is let loose when I find myself hanging on in suspense, like waiting for the start of a race. Over the years I have also come to anticipate the searing burst of white noise that can reach a deafening level when the ore slides down the chutes, followed by a slow winding noise as the 8,000-ton chutes are raised back upright as another is descending nearby.

On most Great Lakes ships, it's the First Mate's job to make sure the cargo is properly loaded. On the *Jackson*, this falls to Mike MacDonald, a man who has spent hundreds of dollars outfitting himself for the various weather he will encounter on the job. Today he's wearing a bright yellow slicker and rain pants. Beneath the brim of his hardhat his eyes are shielded behind thick, black-framed safety glasses. A moustache and dark goatee outline the contours of his face. The ore is at the dock and in the train cars, so even with a few delays to let a downburst go through, the loading is well into the second run. Each rail car holds about 250 tons of ore so if the *Jackson* loads 22,500 tons, it is the equivalent of 90 hopper cars.

The estimated departure time is around noon, which is good because a change in the weather is expected to arrive by mid-afternoon when a low-pressure front moves onto the lake, accompanied by winds increasing from the northwest to about 30 to 40 miles per hour. In the pilothouse we are introduced to the ship's captain, Paul Berger. Wearing a burgundy Interlake polo, Berger is of medium height, has a full, round-shaped face with short cropped hair graying slightly at the temples. He is calm and self-possessed. He looks young for a captain. "Welcome to the *Jackson*, the 'Last of the Originals.'" As he goes over the ground rules and safety details for the trip, he gets updates on the loading and the weather. Berger wants to get his ship out of Marquette before the wind picks up. If the loading goes much beyond noon he may have to wait at the dock until the front passes. The delay



Since 2013, Paul Berger has been Captain of the *Herbert C. Jackson*.

could mean a loss of about eight hours. What he's hearing from the mate is good news so far.

By late morning the trunk hatch in back is full and the unloading boom is re-centered over the deck. Mike Ojala, the ship's bos'n, is systematically lifting hatch covers and setting them back in place atop the coamings while every available deckhand trails behind tightening hatch clamps over the steel covers in anticipation of rough weather. Mike began sailing on the Lakes in the early 1970s out of Superior, Wisconsin, and his name is now up there near the top of the list on the unlicensed roster of mariners for Interlake Steamship. He has a reputation as a tough, no nonsense deck boss and the crewmen working under him reflect a similar taciturn nature. The last time I'd seen Mike he was wheeling, but he told me he felt confined being in the pilothouse so he went back out on deck where he feels most comfortable.

The *Jackson* is backing away from the dock right around the noon hour. The wind is beginning to stiffen, the sky has taken on a purplish hue, the lake flecked with whitecaps dancing across its surface. I am already calculating in my head — noon depart, midnight at the Soo, nighttime in the St. Clair and Detroit Rivers, daylight at the Rouge and outbound. Ships run on time. Time is the nature of everything on board the ship. How long to load, how long from dock to dock, how long to unload, how much time for sleep, etc.

Once clear of the dock, Berger uses a combination of bow thruster and rudder to make a roughly 180-degree turn as he brings the *Jackson* to an easterly facing direction. From my vantage point looking aft, the large "Superior Dome" on the Northern Michigan University campus looms in the distance directly behind the ship. When viewed from the water, its geodesic shape resembles a giant beaver dam sitting on the edge of the shore, or perhaps a big communal sauna that the City of Marquette uses in the winter? The *Jackson* slowly comes around as it heads into the lake, the water pushed through the propeller at the stern roiling as it collides with the swells coming into the bay. With time on our side we will be able to outrun the wind and the waves to Whitefish Bay in about ten to twelve hours.

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It's just past midnight when the steamer *Herbert C. Jackson* begins moving out of the Poe Lock at Sault Ste. Marie, Michigan, the enormous ship and its cargo lowered from the level of Lake Superior, the highest above sea level of the five Great Lakes, to the level of Lake Huron. The main deck of the *Jackson* is now 21 feet lower and nearly level with the top of the lock walls. The town of Sault Ste. Marie is quiet at this hour. While there's little to no traffic along Portage Avenue, the original bypass of the St. Marys rapids, the *Jackson* is a hive of activity as deckhands re-coil heaving lines and bring in the mooring cables while the mates position themselves forward, aft and mid-ship to give distances to the captain as the *Jackson* departs the lock.

On the ship's bridge, the chadburn clangs like the ringing of a firehouse bell. It sounds bright and precise as Berger signals the engine room for a change in speed. Where there's a chain of command there's also a chain of dependency. Next year all he'll need to do is push a small lever to change speed, no longer relying on someone over 600 feet away and several decks below the surface to respond to the radio telegraph order.

The large, timber-lined lock gates open slowly in front of us. An upbound "salty," the *Federal Ems*, is nearing the upper pier on the east side of the locks, assisted by two G tugs (Great Lakes Towing) to guide it into the lock. Captain Berger watches them approach with a sense of curiosity, admiring how the tug captains handle their crafts in this obvious mismatch in size. With the salty carrying little ballast and being empty of cargo, its freeboard must be 20 feet or more, dwarfing the tug at its bow. The tug's job, explains Berger, is to get the upbound salty to the lock entrance without going into it, which requires skilled maneuvering to position the tug against the ship and then get out of its way at the last minute.

“He’s sideways to this guy, pinning his bow against the dock,” explains the captain. “He’ll get up by the nose pier and he’ll feather himself back, feather himself back, feather himself back — at the very last minute you’re thinking you’re going to smash his poor bastard and the next thing you know...brrrrum...he backs out of there and away he goes. Same way coming downbound, he’s sideways, sideways, sideways, he comes up to the nose pier, he feathers, feathers, feathers, feathers, and right at the last minute, he breaks away and shoots-in in front of you and locks down with you.”

Captain Berger learned to handle boats at an early age. He grew up the nephew of Jack Lamb, a captain with the Neuman Line (Neuman Ferry & Cruise Line), a small fleet of ferry boats operating between Marblehead and Sandusky to Kelleys Island and North Bass Island in Lake Erie. From about the age of two he would sit on his Uncle Jack’s lap and help “steer” the boat. Berger speaks fondly of his uncle and keeps his photo hanging on the wall of his office. “His passion of boats, ships, and the water was contagious,” recalls Berger. “From my earliest childhood, during summer vacation, all I wanted to do was go for a boat ride with Uncle Jack.”

Berger eventually became a captain with the ferry line, working for a dozen years before he joined Interlake Steamship in December 1997 as a watchman aboard the *Mesabi Miner*. Berger worked his way up the ranks with the same energy and enthusiasm that marked his tenure with the Neuman Line. In 2013, he was named captain of the *Herbert C. Jackson*.

The appointment was a milestone in his career, but his proudest moment came as he passed Sandusky, Ohio, in command of the *Jackson*, a memory he reflected upon when speaking at the funeral of his Uncle Jack in 2014. “I am so thankful that he was on the Jackson Street pier when I came by as the permanent master of the *Herbert C. Jackson*. It’s comforting to know that he got to see me and understood that the dream we shared my whole life, of me becoming a freighter captain, had finally come true.”

Berger’s Uncle Jack was the first of many seasoned masters to teach him the tricks of the trade. As he guides the *Jackson* out of the lock and past the salty, Berger recalled coming into the very same lock years previously aboard “this old junk Polish ship with a direct reverse diesel” while working on his river pilotage. The only way to go from ahead to astern with a direct reverse diesel engine, explains the captain, was to shut the engine off, switch the cams and then restart the engine going astern. His story is a fitting example of the changes in technology he has seen in a relatively short span of time.

“A merchant ship, it cannot be over emphasised, is built for one purpose only: to make money, to produce, like any other piece of machinery, a reasonable return on capital invested.” Dr. Basil Greenhill, 1993

Like the advent and growth of steam in the age of sail, the replacement of steam has been going on for years. Steamboat purists would argue that the true loss of steam came with the end of the reciprocating engine. Author and photographer David Plowden mourned its loss nearly a half century ago in the prologue to his book *Farewell to Steam* in 1966. “This creation is perhaps the simplest and most beautiful power mechanism that man has ever devised,” wrote Plowden, “to me all other machines pale by comparison.”

When the order for construction of the *Jackson* went on the books, steam-powered ships were by no means nearing the end of their existence on the Great Lakes. Built in Detroit at the Great Lakes Engineering Works and side-launched into the Rouge River in 1959 as hull number 302, the *S/S Herbert C. Jackson* entered into the iron ore trade as one of 32 steamers in service that year for Pickands Mather & Company. In addition to the hundreds of steamers already on the Lakes at the start of the 1960s, no one could have predicted that the *Jackson* would actually be one of the last American steamships built for use on the Great Lakes.

Historically, the *Jackson* was the second to the last ship built at the Detroit shipyard, one of the last American ships built with fore and aft deck housings, the first built with engine controls forward of the boilers, and the last steamship built for Pickands Mather. Upon completion, the *Jackson* was officially registered with a weight of 12,752 gross tons, an overall length of 689 feet, and a beam of 75 feet. A General Electric double compound steam turbine engine with 6,000 shaft-horsepower was installed to power the *Jackson*.

Clevelander Herbert Cooper Jackson was born in 1894. Like many men who later came to the mining and shipping industry, Jackson attended school in the Ivy League. After graduating from Yale University in 1916, Jackson returned to Cleveland where he joined the staff of Pickands Mather, parlaying his bachelor's degree into a solid career, eventually making his mark as a mining tax expert. In a biographical sketch of Jackson by the late John Greenwood, himself a former shipping executive, Jackson's rise to leadership within the company began in 1942 when Jackson was promoted to a partner. He became a managing partner between 1956 and 1960, the position he held at the time his namesake was launched. “In 1960 he was elected executive vice president and retained that title until retiring in December 1962, after forty-six years with the company,” concluded Greenwood. Herbert Jackson passed away in Cleveland in 1981.

With the *Jackson* out of the lock, Captain Berger winds the crank on the telephone mounted on the wall with a few quick rotations of his wrist, calling the engine room. "Hi Paige, let's go to five-five on standby." This is one of the aspects of steamboating that will end when the *Jackson* is converted to diesel. For Berger, the immediate reaction time he will gain by having direct control of the engines is a huge advantage over the current system. He uses this short stretch between the locks, the supply ship *Ojibway*, and the lower St. Marys River to illustrate his point.

"The rivers all have speed limits," say Berger. "Okay, right now I'm turning 70 turns and we're getting up to our speed, so now I have to call the engine room." Berger winds the phone again and tells the engineer he wants 55 rpm now. "So now she's going to crank us down to 55 rpm. When we get down there a little farther that won't be fast enough so I have to call her again and say bring her up to 60 rpm and then we get down a little farther and that still won't be fast enough and then you go to 65."

In the engine room, 3<sup>rd</sup> Assistant Engineer Paige Jehnke is at the ship's throttles. In stark contrast to the dimly lit bridge, the ship's engine room is lit up like the kitchen of a large restaurant. It's hard to find any hint of a shadow between the freshly wiped floor and the high gloss white and gray paint that coats most of the walls and machinery. This is the heart of the *Jackson*, a fine-tuned cacophony of engines, motors, and machinery that handle everything from propulsion power, steering, house electricity, potable water and sewage treatment. When the pilothouse calls for a change in speed, she makes the adjustment and waits for the next command. For the remainder of her four-hour watch in the river, Paige will be tethered to the throttle deck to respond to any calls from up forward.

"Let's say 65 will only get us up to 11.7 miles an hour," continues Berger. "Well, the speed limit's 12. So, do I call her and tell her give me 67 rpms? you know, where next year it'll be, no that isn't quite enough, pffft, pfft, you push the handle a little farther, give it a couple more degrees of pitch, another couple feet of pitch — it's going to be better all the way around."

Back in the darkened pilothouse, 2<sup>nd</sup> Mate Jean-Francois Pannelton arrives for his four-hour watch and settles in with the captain and the wheelsman for the descent down the St. Marys River before reaching Lake Huron around the breakfast hour. In a few minutes the supply boat *Ojibway*, better known as the grub boat, will be alongside. It's a light load tonight, just a few lifts. Once everything is stowed away around two in the morning the crew can get some rest knowing they have all of Lake Huron ahead of them when daylight comes.

It's morning on northern Lake Huron as I walk down the deck towards the after end. The sun is at my back today with the *Jackson* now heading in a southerly direction toward the St. Clair River. We're surrounded by an expanse of dark blue water, slightly ruffled by a light breeze but beneath a clear sky. To my left is the eastern side of Michigan, its bluish-green shoreline hazy in the morning light. Aside from its heavily forested interior, this is quarry country, home to some of the largest limestone and mineral deposits in North America. The loading ports of Alpena, Port Calcite (Rogers City), and Stoneport provide a constant flow of natural resources for construction and manufacturing throughout the Great Lakes basin.

This will be my first time going into the engine room on this trip. Dave Zalewski, the permanent Chief Engineer on the *Jackson* is on vacation, so I'll be the guest of Bryan Brenner, permanent First Assistant and relief Chief. I'm excited to take a look around, talk to some of the crew on watch and let them get familiar with the guy walking around with the cameras. It gives everyone a chance to ask questions and figure out what I'm up to if they're curious.

The access doors to the engine room are located just inside the after cabins on either side the spar deck. Once I'm in the entryway I push in some ear plugs before descending the ladder to the main deck. A change in temperature is immediate but doesn't rise dramatically as I work my way down. The decibel level from the machinery is more noticeable, but with my hearing protection I'm ready for my visit.

Engine rooms are multi-leveled spaces designed to house the ship's engines and auxiliary machinery. The lay-out on the *Jackson* is similar to nearly all vessels of its era; it has a main deck, an operating deck, and the engine room floor. Above the main deck are catwalks and ladders that lead upward around the piping and vents encased in the vessel's smokestack. Below the engine floor is the ship's inner bottom, located about five to six feet up from the keel and running the entire length of the vessel from the forepeak bulkhead to the after peak bulkhead. Beneath the cargo holds, this space is used for ballast water. The annual clean-out of these tanks is one of the dirtiest jobs on a boat, and if you're claustrophobic this is the last place you want to work.

I start my self-guided tour by descending to the lowest level of the engine room. There isn't a "floor" per se, rather grids of steel grating that can be easily moved to allow access to whatever sits atop the grating, below it, or pops up through it. Down here you can really see the slope of the hull as it tapers toward the stern where the propeller shaft runs. Two rows of ballast pumps are located here, as well as auxiliary ballast pumps on the port



View of the engine room floor showing circulation pumps, feed pumps, water strainers and more. This room is a learning experience: everything you run into made of steel is going to hurt.

and starboard sides, along with sewage pumps, lube oil strainers and purifiers, cooling water strainers, bilge pumps, and tons of piping surrounding the main engine foundation. This is definitely a head-knocking, shin-biting area, so I keep my movements slow.

The next deck up is the operating deck. This one will see considerable change once the *Jackson* is re-powered. The starboard ladder up from the engine floor comes out near the control console in front of the turbines. I get confused which direction I'm facing down here because of the location of the ship's boilers. For instance, on the *Kaye E. Barker* or the *Beeghly*, when those vessels were steamers, the boilers were directly behind the console or throttle deck. Here on the *Jackson*, they are across the deck on the other side of the engines. Of course, if I'm really unsure which way I'm facing I can always go up one level to one of the gangway doors to see which way the water is flowing along the hull, or better yet, poke my head out like a dog from a car window and enjoy the breeze and the cool air coming off the water.

The operating deck is home to the upper halves of the steam turbines, the control console, aside which stands a small air conditioned office not much larger than a phone booth, the base of the two main boilers, the main electrical switchboard, and the steam-powered electrical generators for ship's power. I don't get too far before Tom Acton, the QMED on the 4 to 8



watch, challenges me with a photo op; catching a shot of the fuel spraying into the boiler. Tom is instantly likeable. He tells me he came late to sailing, starting in his early 30s after watching the ships come and go from his home in Duluth. After making sure I've donned all the necessary protective equipment, especially a heavy-duty face shield that made me look like a shipyard welder. Tom opens the site hole to the inside of the boiler. It's a lot like looking into your home furnace, just a lot bigger, the fuel spreading out from the burner tip into a bright orange circular shape. I get as close as I dare without actually putting my lens into the boiler because a boiler at 700 degrees plus will melt my camera.

One level above this is the main deck of the engine room. Since most of the big machinery is located on the lower levels, this deck serves as home to machine shops, lockers, storage spaces, a laundry room, the chief's office, and the steering gear. The upper halves of the two-story boilers that generate the steam to power the turbines rise up behind me from the engine deck beneath. The main boilers on the *Jackson* were manufactured by Combustion Engineering, Inc. of New York City. Combustion Engineering was founded in 1912, and by World War II they were one of the largest suppliers of steam boilers for the U.S. Navy, for both fuel oil and coal fired ships. The company enjoyed a long and successful history into the nuclear era before being acquired by a Swiss-Swedish engineering conglomerate in 1990. It's hard to believe that in a few months all this equipment will be taken out in pieces, ready for the scrapyard. For now, however, I have a bird's eye view of the top of the turbines and the engine room control station on the deck below.

The main propulsion engine (General Electric Marine Steam Turbine No 128462, built in Lynn, Massachusetts), is a cross compound steam turbine, meaning it has separate high and low pressure sections. Simplistically, a turbine is "a large wheel secured to a shaft with blades secured to the wheel. A high velocity jet of steam is directed by nozzles against the blade row in such a way as to cause a rotative movement of the shaft." The manufacturer's plate on the high pressure section has a rated capacity of 6,000 HP based on an operating pressure of 450 pounds per square inch (gage) at a temperature of 750° F before the exhausted steam is sent to the low pressure cylinder. Hidden away inside its steel casing, the high pressure turbine spins at over 5,500 rpm, so a double reduction gear set is in place between the turbine and the main shaft to reduce that velocity so that the propeller shaft spins somewhere between 100 to 130 rpm, at full speed. The low-pressure side of the engine is the ship's astern turbine, using about half the speed of its ahead rating, roughly 50 rpm when backing.

“Merchant ships have two main functions. They are the servants of trade, and relate in their designs and patterns of movement to the commodity supply and demands of the world. Merchant ships are also business ventures and reflect the financial decisions of their owners and managers. The first objective influences the second but does not dictate it. Owners will order ships, accept cargoes and follow routes to the extent that these are profitable and safe. The background to their financial decisions is the operational environment. This has many uncertain variables, ranging from climatic conditions to politics, and is subject to sudden changes well beyond the control of individual managers.” Professor Alistair Couper, MA, PhD, FRICS, FNI, FCIT, Master Mariner

The end of World War II is generally recognized as the benchmark point during which the steam turbine became the marine engine of choice. Up until that time, the use of reciprocating engines, steam turbines, and diesel engines were all prevalent means of propulsion throughout the world. Specific to the Great Lakes, however, the use of diesel propulsion was minimal at best. The post-war growth in vessel size worldwide created a need for more power, pushing the steam turbine to the forefront of the industry. The reciprocating engine declined in popularity in part because increasing the scale of the engines was not cost effective from a size and weight perspective per the amount of fuel consumed, even though fuel was cheap. On the diesel front, that technology had not yet evolved to produce more power for the same amount of fuel burned without also producing huge engines, which again were size and weight prohibitive. Whether it was coal-fired or oil burning, the steam turbine was deemed the most efficient. Professor Charles E. Mathieu, a contributing author to the *Conway's History of the Ship*, noted that between 1968 and 1973 “steam turbine orders increased from about one fourth to one third of the large engine orders.” So what happened to steam? Nothing really, except that the world changed around it.

There are many factors outside the control of shipping companies that can have significant impact and change their mode of operations. None was perhaps more devastating to U.S. shipping than the 1973 oil embargo. The embargo was initiated by members of the OAPEC in response to U.S. involvement in the 1973 Yom Kippur War. The cost of oil went from around US\$3 barrel to 6 times that price within a year. A lot of people still remember the price of gas for the car jumping from around 38 cents per gallon to over 55 cents per gallon. Imagine what that translates to when your fuel tank holds 120,000 gallons.

The momentum that steam power had gained up to this point was quickly erased by the power of economics. Steam turbines have an overall

thermal efficiency of around 35 percent, and during the time-period from the 1950s into the early 70s, powered by a readily available and cheap supply of coal or fuel oil, they easily were the engine of preference on the Great Lakes. The embargo changed all of that. In order to cut their costs, ship owners immediately altered their business practices by reducing speed, and or cutting back the number of nozzles on the turbines to reduce fuel consumption. It was an effective strategy but still did not change the efficiency of the steam turbine. As fuel prices continued rising, profits dropped, and to make matters worse, looming on the horizon were rumblings of environmental concerns with engine emissions from vessels of all types. Steam was on the edge of a dramatic change.

Similar in thermal efficiency to steam, the output of marine diesel engines also hovered around 35 percent, but unlike steam, 1950s marine diesel technology continued evolving. Spurred on by the use of turbocharging (originally developed in the 1920s) and its implementation in low speed, 2-stroke diesels, engineers were able to increase the engine power of diesel by one-third to two-thirds, thus pushing it beyond the power generated by steam at the same fuel to cost ratio. After the embargo hit, ship owners knew there would never be a return to steam.

By the 1980s, medium speed, 4-stroke diesel engines further reduced fuel consumption. When shipbuilding resumed on the Great Lakes following the economic recession of the early 1980s, all new vessels were powered by diesel engines. Many people who enjoy following the industry have the impression that the current environmental regulations are the primary cause of steam's decline, and while they are a contributing factor, in my mind the evidence just doesn't support it.

Interlake Steamship has been very proactive in re-fitting their vessels for the future with the latest in engine and emissions technology. The first of Interlake's steamships repowered was the World War II era *Lee A. Tregurtha* in 2006 when twin Bergen diesel engines were installed, along with fully automated bridge controls. Similarly, Bergen engines replaced the original steam plants in 2009 on the *Charles M. Beeghly*, since re-christened the *Hon. James L. Oberstar*, and on the *Kaye E. Barker* in 2012. In addition to its steamers, Interlake is also upgrading its diesel-powered thousand-footers, replacing the power plant on the *Paul R. Tregurtha* in 2010 with a MaK propulsion system.

The *Jackson* is the last of Interlake's active steamers to be converted to diesel. Unlike their previous conversions, the *Jackson* will be repowered with twin MaK, six-cylinder M32E 4-stroke engines that will produce 6,250 BHP (brake horse power). The new engine technology will have an imme-

diate impact on the bottom line with a significant reduction in fuel consumption. Based on estimates from the already completed conversions, Interlake expects to see a considerable decrease in the daily fuel consumption on the *Jackson*.

“The repowering of the *Herbert C. Jackson* illustrates Interlake’s continuing commitment to shrink its environmental footprint by reducing emissions throughout our fleet,” says Interlake President Mark W. Barker. “We have a long-term vision for our industry and we are investing in our equipment and our ships to offer the most reliable, efficient delivery within an industry that is the greenest form of transportation available.”

The price tag for the ten-year modernization of the fleet isn’t cheap, something in the range of \$100 million, but its impact on the environment is dramatic. Figures released by Interlake for the year 2014 show decreases in particulate matter at roughly 30 percent, sulphur dioxide at 54 percent, and carbon dioxide at 47 percent.

“It’s a sad day leaving the era of steamships behind but it’s a good day as we move forward,” says Barker. “We only have nine months a year to carry close to 20 million tons of cargo for our customers. It’s critical for us



The *Jackson* winds its way slowly out of the Rouge River, passing beneath I-75. In the background is ca. 1921 Norfolk-Southern Railroad bascule bridge. The raised span of Fort Street bascule bridge is in the distance.

to be able to do that without any delays. To meet that goal, we have to invest and keep our ships outfitted with the best equipment in the industry.”

Interlake is also an industry leader in emissions reduction with the early adoption of exhaust scrubber technology recently installed on several of their vessels to further lower their carbon footprint.

The decision to install the MaK engines instead of another Bergen package came about unexpectedly when one of the Canadian fleets made a last minute decision to scrap the steamer *James Norris* rather than repower it. The new and un-used propulsion package intended for the *Norris* (reduction gear shaft, variable pitch propeller, hub and blades) became available in a sort of Craig’s List offering of marine equipment. An added benefit is that the engineers on the *Paul R. Tregurtha*, already familiar with the MaK plant, will be able to cross train and support the engine personnel on the *Jackson* during and after the conversion process.

Following my walk-through of the engine room, I sit down with Chief Engineer Bryan Brenner, and Interlake Steamship’s public relations manager Chrissy Kadleck, to discuss the future of the *Jackson* and his transition from being one of the fleet’s last steam engineers to working on a diesel plant. Bryan is of medium height and slight of build, his receding hairline usually covered with a well-worn tan, Interlake ball cap. A graying beard and glasses shows his age more than his ever present state of pent up energy. “I’m fidgety. I don’t like sitting still,” says Bryan, his hands and feet constantly moving, his eyes always searching for something to do. “Busy’s good.”

Bryan, known as the Fuzzman or Fuzzy, is from the Rogers City area. He’s had the nickname for a long time, although he isn’t clear about how or why he got it, which is probably exactly why he’s call Fuzzy. Anyway, he started out working as a deckhand for US Steel in 1990 on the then vintage *Irvin L. Clymer*, followed by a stint on another classic, the *Calcite II*. So how did he end up over here with Interlake?

“We’d be going by the Interlake boats when I’d be out on deck,” recalled Fuzzy. “They had this hatch crane out there. On the *Calcite II* we used to have to pull the bridles up the deck to take hatches off and, depending on which side of the boat to unload on, we also had to pull the boom cables around and switch them. They (Interlake) had this automatic machine that goes on the deck and takes the hatches off. It was a slow year for US Steel so they called me to come over here. They ‘borrowed’ me to Interlake, and when they called me to come back to US Steel I said, ‘Nah, I’ll just stay here.’” The modern conveniences of single piece hatch-covers and a crane to lift them were not lost on Bryan.

With Interlake, Bryan started out as a deckhand on the *Kaye E. Barker* and as a “rover” for several years, part of a crew that does unloading system maintenance across the Interlake fleet. Like many who sail on the Lakes, he eventually went through the “sorting hat” and found his niche in the engine room, although he admits he wasn’t necessarily interested in engines. “I just knew I didn’t want to paint all my life,” he laughs. In 1994, Fuzzy signed on for the season as a wiper aboard the *Herbert C. Jackson*, and aside from a few years on the *Charles M. Beeghly* before it was converted to diesel, he’s been here pretty much all of his career.

Fuzzy’s story is similar to many I’d heard over the years. He had a job on shore at a sawmill but the work ran out so he applied for work on the boats. “My uncle was captain on the *Calcite* the second (*Calcite II*),” says Fuzzy. “I knew a couple mates, but I didn’t really know any people themselves that sailed around my age group. I wasn’t even going to do this for very long. I came out here to make a few thousand dollars and get back off.”

Twenty-five years later, Fuzzy says he is still “trying to make it.” At age 47, he was the youngest man in the engine room at fit-out this spring, and while it’s been a good living he says it’s a lonely life. He’s been married for 22 years and has three children. Our conversation stops momentarily as he pauses in the midst of talking about being away from his family for extended periods of time. At home, his wife runs the house and shoulders the burden of raising the children. On the surface, his marriage has all the appearance of being a two-way street, but when he’s home on vacation Fuzzy says it doesn’t work that way. “She’s used to me being gone, but I come home and I try to change things,” he tells us. “They’ve got their set ways. ‘We don’t do that,’ she tells me. I think I get put in my place more at home than I do out here.”

As expected, there are mixed emotions about the changes ahead, from nostalgia to a pragmatic approach that it’s finally time to move on. “I’m ready for new adventures,” quips Fuzzy. “Man, that’s sad to say,” he admits, “but we’ve heard about them converting the *Jackson* for so long there’s no sense in fighting it. You gotta just go with it and look forward to new adventures.”

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My alarm is set for 2:30, an ungodly hour for me to be getting up. I take a peek out my window when the alarm goes off, expecting to see the Detroit skyline. Instead of shiny glass towers, I’m seeing smokestacks belching flames and steam. I know exactly where we are, off Zug Island. In a matter of minutes I scramble into my clothes, grab my camera gear and head down the deck toward the after end of the ship. I want to be in the engine room

while we're going up the river to see how things work at the throttle deck, on the other side of the chadburn.

The *Jackson* is already nosing its way into the Rouge River. I don't know how they do it, but the entire deck crew is up, mooring lines are run out, and the landing boom is in place before the bow glides beneath the Delray Shortcut bridge. In the quiet of the morning the rumble of the bow thruster competes with the distant, staccato sounds of locomotive horns, sirens blaring at the steel mills along the Detroit River, and the cry of roosting gulls disturbed by our passing. The air has a distinct taste of metal I associate with these industrial landscapes. For those who turn their noses up at a scene like this, I'd repeat it every day if I could. After growing up along the waterfront in Superior, the powerful senses evoked by this industry are embedded in my personality and life. I find it totally enjoyable.

The rush of warm air from the engine room takes the morning chill off me as I make my way to the control station. 1<sup>st</sup> Assistant Engineer Yvar Yap has just come on watch and stands in his blue coveralls with the name of the company in white and orange lettering floating above an orange and black smokestack stitched across the back. Yvar has coffee in hand as he waits by the chadburn, ready to reply to any commands from the pilot-house. A battered black and white monitor shows a grainy live image of the *Jackson* in the river, while a much sharper image from the AIS feed traces the exact location of the vessel. We hang out and visit while Yvar patiently



First Assistant Engineer Yvar Yap at controls. Qualified Member of the Engine Department (QMED) Tom Acton alongside the chadburn.

explains what the readings on all of the instrument gauges mean and how they use them to monitor the machinery. As the working life of the control console nears an end, a number of the antique brass fittings, the “jewelry” as Fuzzy calls them, have been earmarked for immediate removal when the *Jackson* gets to the shipyard.

I spend about an hour talking and snapping photos as the ship winds its way through the river. Occasionally the chadburn rings and Yvar makes some minute adjustments before returning to his coffee. Somehow I thought there'd be more action involved with this, but then I recall the conversation with Fuzzy earlier in the week. “I don't like being stuck by the throttles in the rivers cause it's boring. You're just standing,” he said emphatically. “Yes you're answering bells, but me being an engineer I can't walk away from there. Once in a while (you can) if you've got a good QMED there at the throttle for you, but nine times out of ten you've got to stay there cause if something happens it's on you, not the QMED.”

May 12, 2013, was one of those times for the *Jackson*, inbound on the Rouge and approaching the Jefferson Avenue bridge. After signaling by whistle their approach to the bridge, the captain waited until the span was fully open before ringing up Slow Ahead. A few minutes later the bridge spans unexpectedly started going down, with the east span landing on the bow of the *Jackson* just above the starboard anchor pocket. The quick reaction of the master to reverse the vessel and crew members to drop the anchors prevented a more serious accident. The allision was eventually determined to be the fault of the bridge operator and the damage to the *Jackson* was minimal. As I walked back on deck from the engine room, I decide I'm going to adopt one of the tenets of Fuzzy's logic, boring is good!

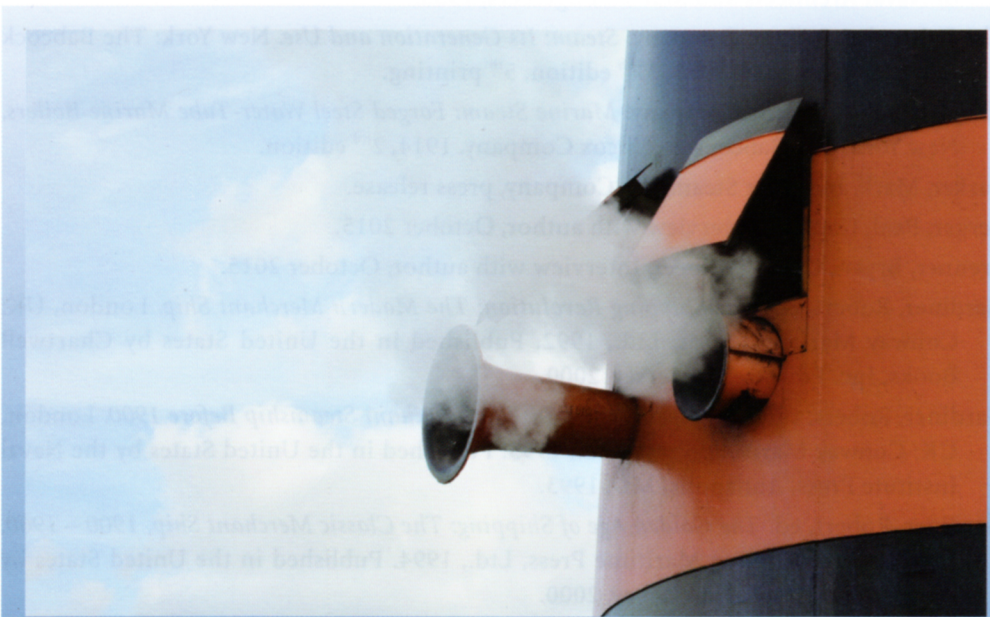
Whether it would have made a difference in this case is pure conjecture, but the chain of command from the pilothouse to the engine room that morning, as well as it worked, still took precious seconds to put into effect. Captain Berger looks ahead to the positive side of the re-powering, having direct control at the moment he needs it, and hopefully preventing a few premature gray hairs. “When you go from half ahead to half astern, you know they've got to get the ahead turbine to get stopped and the astern turbine to take it over and stop the propeller from going ahead and then start going astern, whereas next year it'll be nothing more than the pitch of the blades changing. The nostalgic side of me hates seeing it happen, the practical side of me says it has to. That's all there is to it.”

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The sun is rising over AK Steel's Rouge complex as the iron ore pellets shoot off the unloading boom onto the storage pile. It's business as usual for the deck crew. There's no sign of Fuzzy or Captain Berger. Both are probably catching a few hours of sleep after being up all night in the rivers. It's an eight hour run from buoys 11 and 12 at the bottom of Lake Huron to the dock at the Rouge and both officers are required to stand their watches. Six or so hours later, Berger is back in the front window as he backs the *Jackson* away from the dock, its cargo holds empty and another trip complete.

On our ride back out of the Rouge, we pass the *John G. Munson* unloading limestone at the Carmeuse dock, just east of the Jefferson Avenue bascule bridge. Located along the south side of the Rouge, the bank here is shallow, so vessels bringing in stone sit out in the river, using their unloading boom to reach over the water to dump their cargo onto the dock. Aside from the mooring bollards, there is no real dock infrastructure here, just dirt, gravel and weeds. To tie up the ship, the deckhands have to climb down a ladder into a 14-foot aluminum boat with an outboard motor to bring the mooring cables ashore. Places like this are called workboat docks, and for those with a curious mind for trivia, the name of the *Jackson's* workboat is *Herbie II*.



The *Jackson's* steam whistle will soon be replaced with air-powered horns.

Two months earlier, on August 23, the earthen bank at this dock collapsed into the river, closing the Rouge to all large vessel traffic and creating a nightmare for everyone, particularly Interlake Steamship and the *Herbert C. Jackson*. The weekly round trip from Marquette to AK Steel's mill on the Rouge is the *Jackson's* main trade route. Up until that day you could pretty much set your clock for the arrival and departure of the *Jackson* on the Rouge. For the next two months, no one on the *Jackson* knew with any certainty where they'd wake up the next morning or where they'd be heading in the evening. But that's life on a working ship, and the *Jackson* was easily shifted into other trade runs until the river re-opened.

The *Munson* is also a steamer, and like the *Jackson*, will be repowered over the winter lay-up. There are now less than a handful of active, steam-powered freighters sailing on the Great Lakes, American or Canadian. There is no knowing what the future will hold, but it's a pretty sure bet that within the next ten years there won't be any old steamers like this one left so it's time to sit back, relax and enjoy the scenery aboard the SS *Herbert C. Jackson*, the 'last of the originals.' 

## REFERENCES

- Arnott, David, ed. *Design and Construction of Steel Merchant Ships*. New York: The Society of Naval Architects and Marine Engineers, 1955.
- The Babcock & Wilcox Company. *Steam: Its Generation and Use*. New York: The Babcock & Wilcox Company. 1953, 37<sup>th</sup> edition, 5<sup>th</sup> printing.
- The Babcock & Wilcox Company. *Marine Steam: Forged Steel Water-Tube Marine Boilers*. New York: The Babcock & Wilcox Company. 1914, 2<sup>nd</sup> edition.
- Barker, Mark. Interlake Steamship Company, press release.
- Berger, Paul, Captain. Interview with author, October 2015.
- Brenner, Bryan, Chief Engineer. Interview with author, October 2015.
- Gardiner, Robert, ed. *The Shipping Revolution: The Modern Merchant Ship*. London, UK: Conway Maritime Press, Ltd., 1992. Published in the United States by Chartwell Books, Inc. Edison, New Jersey, 2000.
- Gardiner, Robert, ed. *The Advent of Steam: The Merchant Steamship Before 1900*. London, UK: Conway Maritime Press, Ltd., 1993. Published in the United States by the Naval Institute Press, Annapolis, MD, 1993.
- Gardiner, Robert, ed. *The Golden Age of Shipping: The Classic Merchant Ship, 1900 – 1960*. London, UK: Conway Maritime Press, Ltd., 1994. Published in the United States by Books, Inc. Edison, New Jersey, 2000.
- Gora, Michael. *Earliest Car Ferries to the Lake Erie Islands*. Author, 2011. Retrieved online, [middlebass.org/2011EarliestCarFerriesC.pdf](http://middlebass.org/2011EarliestCarFerriesC.pdf).
- Greenwood, John O. *Namesakes of the 90's*. Cleveland, OH: Freshwater Press, Inc., 1991.

- Historic Bridges.org *Presque Isle Ore Dock Bridge*. Retrieved online May 6, 2016, <http://historicbridges.org/bridges/browser/?bridgebrowser=michigan/oredock/>.
- MarineLink.com *Final Interlake Steamship Vessel in for Repower*. Retrieved online August 5, 2016 from <http://www.marinelink.com/news/interlake-steamship402560.aspx>.
- Jackson, G. Gibbard. *The Ship Under Steam*. New York: Charles Scribner's Sons, 1928.
- King, Reno C. Jr., *Practical Marine Engineering*. New York: Prentice Hall Inc., 1948, 3<sup>rd</sup> printing, Nov 1953.
- Michael Schwartz Library, Cleveland State University. *History of the Iron Ore Trade*. Retrieved online, April 26, 2016, from [clevelandmemory.org/glihc/oretrade.html](http://clevelandmemory.org/glihc/oretrade.html).
- Murphy, Steve. *Neuman's ferry boat service up for sale*. Retrieved online, April 26, 2016, [toledoblade.com/frontpage/2001/09/28/Neuman-s-ferry-boat-service-up-for-sale.html](http://toledoblade.com/frontpage/2001/09/28/Neuman-s-ferry-boat-service-up-for-sale.html).
- NTSB, Marine Accident Brief. *Allision of Bulk Carrier Herbert C. Jackson with the Jefferson Avenue Bridge*. Retrieved online from, file:///C:/Users/patri/Desktop/jackson-jefferson.pdf.
- Paterson, W. B. ed. *Cornell Red Book of Marine Engineering*. Cambridge, MD: Cornell Maritime Press, 1944, revised edition, April 1956.
- Plowden, David. *End of an Era: The Last of the Great Lakes Steamboats*. New York: W. W. Norton & Company, Inc., 1992.
- Walker, Fred M. *Ships and Shipbuilders*. Annapolis, MD: Naval Institute Press, 2010.

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All photos are from the author's collection.