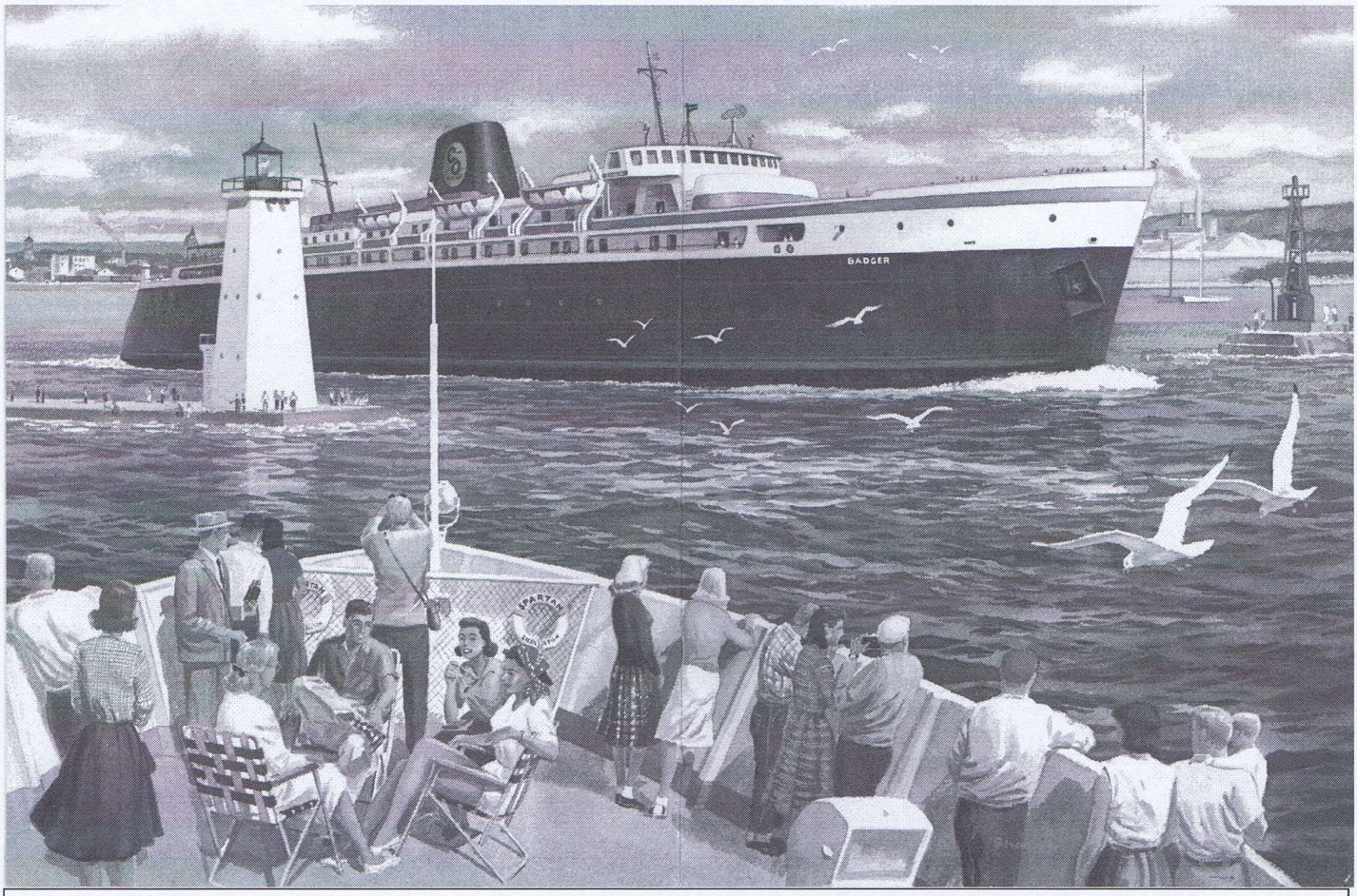
Railroad "Navies"
The C&O "Navy" - Part II

By Frank Dewey



This picture appeared on the back of the cross-lake ferry menus.
From the Frank Dewey collection

Editor's Note: When one thinks of a railroad, normally what comes to mind are trains and tracks. But, railroads all over the world have also had "navies". These were not separate operations from the railroad like Sealand and American Commercial Barge Lines that were owned by CSX Corporation, but not part of CSX Transportation. Rather, these "navies" were an integral part of the railroad operation. The railroads that came to form CSX had a long history of such operations. By far, The Chesapeake & Ohio had the largest maritime operation of any railroad in the United States. The Baltimore & Ohio "navy" was not as big; nor did it last as long, but still it was very diverse. Even Atlantic Coast Line and Seaboard Airline had ties to water operations. In this and the next two issues of News & Notes we will examine these railroads' "navies". Here is part two of the C&O operations on water.

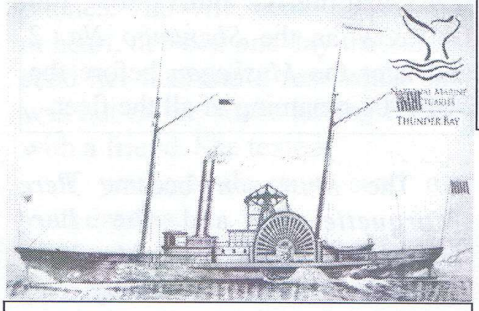
Lake Michigan Ferries

By far, the C&O's largest marine operation was the cross-lake ferries. In fact, during the 1940s and 1950s, it was the largest car ferry operation of any railroad in the world.

It all started in 1874 when the Flint & Pere Marquette Railroad finally reached its planned western terminus at Ludington, Michigan. The railroad had started out of Flint, Michigan in 1857 when it was given its charter as a land grant railroad. It got its name because originally Ludington had been called Pere Marquette. It became Ludington in 1870 named after James Ludington, a local lumberman.

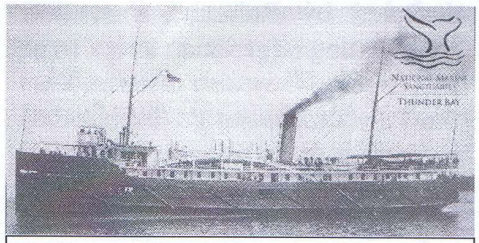
When it reached the Lake Michigan shore at Ludington, the railroad wanted to start a break-bulk steamer service across Lake Michigan and purchased a small side-wheeler called the *John Sherman* in 1875. It sailed between Ludington and Sheboygan,

Wisconsin where it connected with the Sheboygan & Fond du Lac Railway (later to become the Chicago & Northwestern). Primarily planned to carry grain from Wisconsin, it also carried passengers. The *John Sherman* proved to be too small for the operation and the railroad used it for only one season.



The first of the Lake Michigan boats, the *John Sherman*, had a brief service with the railroad after found to be too small.

For the following seasons between 1876 and 1882, the railroad chartered boats from the Goodrich Transit Company. At the time, Goodrich was the largest boat Operator on Lake Michigan. One of its boats, the *City of Ludington*, was built in 1880 just for the F&PM service.



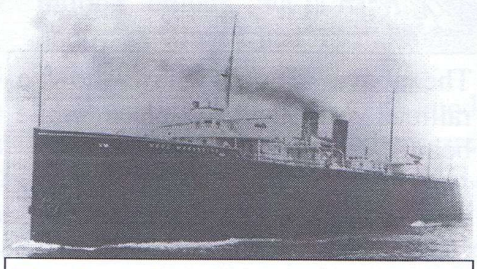
The *City of Ludington* was a chartered boat from the Goodrich Transit Company built for charter by the F&PM.

In 1883, the railroad decided to buy its own boats for the break-bulk service. It built the *F&PM 1* and *F&PM 2.* They were wooden boats that could carry both freight and passengers. Powered by steam engines, they were also rigged with schooner masts for sails. Even though they were wooden, their hulls were strong enough to handle the winter ice of Lake Michigan. Within months after being put into operation, they were determined to not have sufficient cargo capacity and were lengthened by 35 feet. They primarily were used between Ludington and Milwaukee.

Pere Marquette 1, pictured above, and its sister boat, *Pere Marquette 2,* were the first boats built for the F&PM Rwy.

By the end of the 1880s, the business had grown and three more boats were ordered. They were the *F&PM 3, F&PM 4* and *F&PM 5.* The first two could carry break-bulk freight and passengers and the *F&PM 5* could only carry freight since it had no passenger accommodations. The *5* was planned to handle mostly winter flour shipments out of the port of Manitowoc, Wisconsin. During the summers, it often was chartered to other lake Operators.

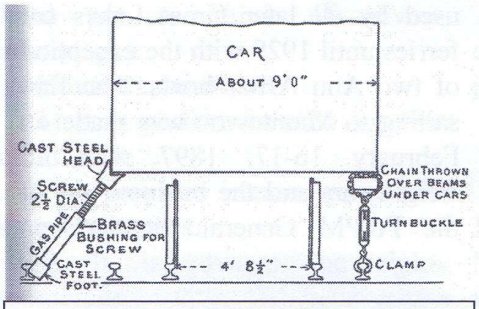
Frank Kirby, a naval architect, designed the first Lake Michigan car ferry, the *St. Iganace*, in 1888. It was followed by five wooden boats for the Ann Arbor Railroad. The Pere Marquette watched the new car ferry operations and started negotiating with the Wisconsin Central Railroad (later it became the SOO Line) for a Ludington to Manitowoc, Wisconsin car ferry route. The WC built a branchline to Manitowoc off of its mainline at Neenah, Wisconsin and completed a dock for the ferry. The Chicago & North Western was unhappy with the WC coming into what it considered its territory and also built a Manitowoc dock. As its part of the new service in 1895, the F&PM ordered a new Robert Logan-designed boat named the *Pere Marquette.* It was to be a 337 foot steamer with twin propellers. Launched in 1896 at the F. W. Wheeler & Company yard in West Bay City, Michigan, it arrived in Ludington on February 13, 1897. It was the first steel car ferry on Lake Michigan. Its basic design was to be used by all later Great Lakes car ferries until 1929 with the exception of two Ann Arbor boats. The first sailing to Manitowoc was made on February 16-17, 1897 with 22 freight cars and the business car of the F&PM General Manager on board.



The first of the F&PM's car ferries, the *Pere Marquette*, later to become the *Pere Marquette 15.*

The Ann Arbor Railroad was the first to operate car ferries on Lake Michigan. Therefore, they were the first to come up with a way to keep the railroad cars from moving freely while in transit. After all, the railroad cars could not be allowed to moved back and forth as the boat pitched and rolled during the storms experienced on Lake Michigan. The AA designed a system that used screw jacks anchored on jacking rails running 25 inches outside of the running rail. The jacks lifted the car slightly off of the trucks. Then, the cars were chained down to the jacking

rails using a turnbuckle and rail clamp. Four or more jacks and chain clamps were used per car. The car trucks were also chained to the rails to prevent their movement. This became the universal way to hold the freight cars on all of the Great Lakes ferries. The only downside was that on occasion the cars wereth put incorrectly back onto their trucks. As a result, they were off-center and would either have to be caught by car inspectors in the railroad yard or set-out on line-of-road while in a train to prevent a derailment.



The above diagram shows how a railroad was held in place while being carried on a crosslake ferry. *Diagram from The Great Lakes Car Ferries by George W. Hilton*

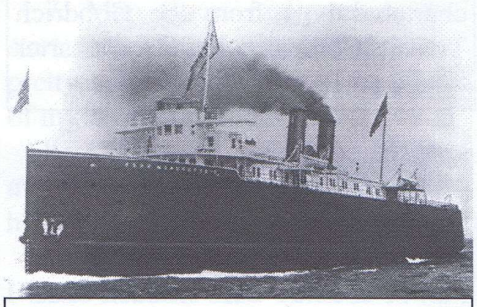
The F&PM, like many of the railroads of Michigan was built primarily to carry lumber. Unfortunately, by the end of the Nineteenth Century, the lumber supply in Michigan was playing out and the railroads were looking for other sources of revenue. In 1900, the F&PM, who by then extended from Toledo, Ohio to Ludington, joined with two other lines to form the Pere Marquette Railway. Those lines were the Detroit, Grand Rapids & Western (Detroit to Grand Rapids) and the Chicago & Western Michigan (LaCrosse, Indiana to Petoskey, Michigan). The new railroad decided that its future was to become a bridge carrier between Chicago and the east. The line from LaCrosse was extended to Porter, Indiana and then through trackage rights agreements, the line got into Chicago and its numerous connections to the west and south. To move further east in 1903, the Lake Erie & Detroit River Railway was purchased from the Hiram Walker family. This gave the PM a "Y" shaped railroad between Walkerville, Ontario (Windsor), Sarnia, Ontario, and St. Thomas, Ontario. The PM then got trackage rights to use the Michigan Central (New York Central) line out of St. Thomas to Buffalo, New York and Suspension Bridge, New York. That completed the bridge route from the west at either Chicago or via the cross-lake operation to the eastern carriers at the Buffalo Gateway with access to the middle Atlantic States and New England.

With the merger of the Detroit, Grand Rapids & Western, also came another car ferry operation. The DGR&W had a wooden car ferry, the *Shenango No. 2*, leased for service between Muskegon and Milwaukee. The service had started in 1897. In 1898, the railroad bought the *Shenango No. 2* and renamed her the *Muskegon*. In September, 1900, the newly merged PM announced that the *Muskegon* was being moved to Ludington to Milwaukee service. Thereafter, the railroad only had service out of Muskegon during the fruit harvesting seasons until all service out of Muskegon ended in 1908. Using only one eastern port on Lake Michigan meant that more boats were breaking the ice to allow year-round operation.

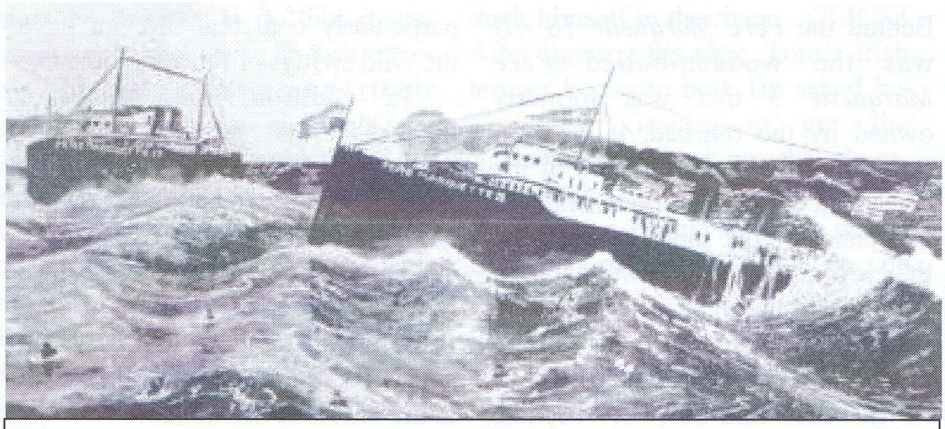
In 1901, the Pere Marquette renamed it fleet of boats. The Lake Michigan car ferries were to be numbered 15 and up, the break bulk boats were 1 through 5 and the river ferries were from 14 downward. Thus the break-bulk steamers became *Pere Marquette 2, 3 4* and *5*. The *Muskegon* became *Pere Marquette 16* and the *Pere Marquette* became *Pere Marquette 15*, a name it did not actually carry on its sides until 1924.

Pere Marquette 16 pictured above was originally built for the DGR&W as the *Shenango No. 2* and later the *Muskegon* before the PM 1901 renaming of all the fleet.

The PM car ferries were proving to be a success. In 1900, they carried 27,000 railroad cars; and in 1904, they carried 75,000. The railroad ordered four more ferries. The *Pere Marquette 17* came in 1901 and was the first ferry of the newly merged railroad. *Pere Marquette 18 (I)* was put in service during the winter of 1902-1903. *Pere Marquette 19* and *Pere Marquette 20* came in 1903. Although each of these boats were designed by Robert Logan, they were getting larger and carried more passengers. They also differed from the *Pere Marquette 15* in that they had triple expansion engines while the older boat had compound engines fore and aft.



Pere Marquette 17, above, shared its design with the PM 18(I), PM 18 (II), PM 19 and PM 20.



During a storm off of Milwaukee, the *Pere Marquette 18 (I)* took on water and quickly sank with the Pere Marquette 17 standing by. This was the only sinking of any of the Pere Marquette/C&O/Chessie System boats.
From the Kenneth Thro collection

In 1903, the new boats allowed the railroad to expand its cross lake again and a route was added between Ludington and Kewaunee, Wisconsin. The plan was to have three boats cover the trips to Milwaukee, one boat to take care of Manitowoc and the rest to take care of traffic as needed.

The new car ferries were more economical than the break-bulk boats. Break-bulk means that the freight arrives at the port in a freight car. It must then be unloaded by hand and taken to the boat to be again loadeded by hand. Then after the trip across the lake, it had to be unload again by hand, taken off of the boat and loaded into a railroad car. The ferries eliminated all of this manual handling. In addition, they fit the railroading of the turn of the Twentieth Century. The typical freight train was only about 25 cars and that was the capacity of the car ferries. In addition, most of the freight of the day moved in boxcars that could be loaded in both directions. As a result of the economies of the ferries in 1903, the Pere Marquette Railway sold the *Pere Marquette 2, 3,* and *4*. It retained the *Pere Marquette 5* for its summer service carrying passengers and break-bulk out of Milwaukee to Ottawa Beach (Holland), Michigan. The *5* was finally sold in 1906 leaving the railroad with no more break-bulk boats.

The arrival of the four new steel ferries also made the wooden *Pere Marquette 16* surplus. She was used on Lake Erie for the Marquette & Bessemer, a PM affiliate, in 1905, chartered out for a few seasons and finally sold in 1917.

On September 8, 1910, the *Pere Marquette 18 (I)* sailed out of Ludington for Milwaukee with 29 railroad cars on board. Early the next morning while in the middle of the lake, a member of the crew found the boat taking water in the aft part of the boat. At first, it was thought to be the result of an open deadlight (porthole). It was closed, but the boat continued to take water. Several of the freight cars were jettisoned to lighten the boat's stern and a seacock was opened to try to equalize the boat. The Captain attempted to make the Wisconsin shore at Sheboygan and a CQD distress signal (This was before SOS was adopted internationally as the distress signal. It was first used during the sinking of the *Titanic* in 1912) was transmitted. The *Pere Marquette 17* was nearby and came to try to help, but could not get close enough to either tie on or take some of the passengers off. The pumps were working and seemed to be keeping up. The officers thought they had control of the situation and did not order "abandon the boat" or even require the donning of life jackets. Suddenly, the *Pere Marquette 18 (I)* took on a great deal of water and went down by the stern. The *Pere Marquette 17* was able to save 35 survivors, but 27-29 crew and passengers were lost. It was the only boat of the F&PM/PM/C&O cross lake service to ever be lost. There was a full inquiry made to determine what caused the boat to take water so quickly, but no cause was ever established. All of the officers on board had been lost. As a result of its sinking, all cross lake ferries then in existence or built later had seagates so that water did not come onto the car deck.

A replacement boat was needed and an order was given to American Ship Building for a similar boat. Their yard at South Chicago was available and built a replacement boat in an amazing 90 working days. The boat was given the same name as the one it was replacing, *Pere Marquette 18 (II).*

World War I resulted in the railroads falling under the control of the United States Railroad Administration (USRA). The car ferries were put under a part of the USRA called the Lake Michigan Carferry Association. That included the five boats of the Pere Marquette, the four boats of the Ann Arbor and the two boats of the Grand Trunk Western. W. L. Mercereau of the Pere Marquette was made the Superintendent of Steamships for the LMCA. At the end of the war and after carrying a huge amount of traffic, the ferries were returned to their railroads.

The Lake Michigan car ferries were built as ice breakers. The U.S.

One of the PM car ferries is shown surrounded by ice. This appears to be the sheet ice that the boats could break up either by cutting through it or by riding up on it.

Coast Guard did not have any ice breakers assigned to Lake Michigan during most of the period that the car ferries were in operation. Therefore, when any boat on the lake got into trouble, it was the car ferries that had to come to the rescue. Normally, this was to assist another of the car ferries since most all shipping stopped when the winter season started. This is still the practice to this day.

Much of the ice on Lake Michigan is sheet ice and the car ferries could handle it easily. They were constructed with reinforced hulls and all had very sharp bows to be able to cut through the sheet ice. In addition, their engines were capable of producing great horsepower. This was necessary when they got into pack ice which formed on the eastern or windward side of the lake. The winds and flow of the water would force the ice along the shore and cause it to build up. This could result in ice of great depth and strength. To break it, the boats would have to ride up onto the ice and let their weight break through. It usually worked.

The winters of 1918, 1919 and 1920 were particularly hard on the car ferries. For example, on March 8, 1920, the *Pere Marquette 18 (II)* became frozen in the ice off of Ludington when it was returning from Milwaukee. The *Pere Marquette 17* had to come to free it. Behind the *Pere Marquette 18 (II)* was the wooden-hulled *Pere Marquette 3* that was formerly owned by the railroad. It also got trapped in the ice. The force of the moving ice cut the wooden hull in two and the boat sank. Fortunately, the crew and passenger were able to get off of the boat and literately walk over the ice to the safety of the nearby *Pere Marquette 18 (II)*.

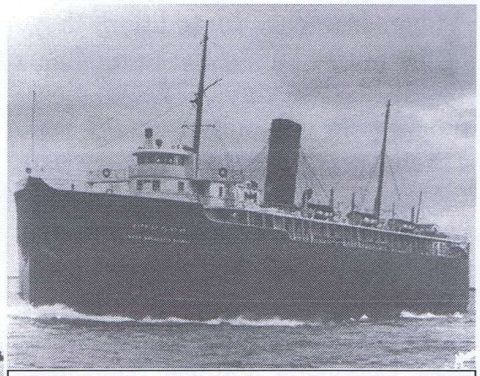
In the mid-20s, it became apparent that the traffic had grown to a point that new boats were needed to be added to the PM's fleet. In 1923, the railroad placed an order with the Manitowoc Shipbuilding Company for two new boats, the *Pere Marquette 21* and *Pere Marquette 22*. The cost for the two boats was $1,750,000. They were placed into service in 1924. They were still of the Logan design, but larger. Their triple expansion engines could produce 2700 horsepower for each of the twin-propeller boats.

In 1929, the Pere Marquette Railway came under the control of the Van Sweringen brothers. They also controlled the Chesapeake & Ohio and the Hocking Valley. This strengthened the PM. The auto industry had produced a booming economy in Michigan and had become the major customer of the former lumber railroad. Now it was subject to the fluctuations of the auto business. The C&O/Hocking combination added more traffic, particularly coal that did not have the wild swings of the auto industry.

In addition, the passenger business was growing rapidly. Americans were getting their first taste of the freedom that the automobile could give them. The cross lake route between Manitowoc and Ludington was made a part of U.S. Highway 10; and U.S. 18's eastern terminus was at the ferries at Milwaukee.

Orders for new boats were placed with the Manitowoc Shipbuilding Company for an additional two boats. They were a departure from the earlier boats in that they had turbo-electric drive. Four Babcock and Wilcox water tube boilers with automatic stokers provided power to two propulsion motors, each with 3600 horsepower. Where all of the older boats could cruise at 14 Miles Per Hour, these boats could make 18 mph. They also had more passenger space including 43 staterooms. Their profile was new with raised forecastles and a single stack. Because they were such a large change from the older boats, they started a new number series and a new naming convention - *City of Saginaw 31* and *City of Flint 32*. Between April 8, 1930 and April 6, 1931, the *City of Flint 32* set a

PM 21 and sister boat PM 22 were larger and faster than the previous boats.



City of Saginaw 31 and *City of Flint 32*, pictured above, carried more passengers and had turbo-electric engines.

world distance record for a marine vessel by sailing more than 100,000 miles in 363 days.

Almost as soon as the new boats joined the fleet, the depression started and brought a huge drop in traffic. The railroad put the *Pere Marquette 15*, the original PM car ferry, in storage. She was scrapped in 1935. *Pere Marquette 19* and *20* were used very little throughout the 30s. In 1938, *Pere Marquette 20* was sold to the State of Michigan to be used in passenger ferry service. If was joined by *Pere Marquette 17* in 1940. *Pere Marquette 19* was also sold in 1940 and turned into a barge for pulpwood.

In 1935, the car ferries had not missed a day of operation; and the railroad publicly boasted of the achievement. That record was lengthened until 1944 when two days of sailing were missed due to extreme weather and the shortage of skilled crewmen caused by World War II.

By 1939, the passenger business was growing even more; and the end of the depression was in sight. The railroad needed another boat. The railroad placed an order for a boat of a completely new design. It would have 74 staterooms and could hold fifty automobiles on its boat deck. The engines were also new. There were two five-cylinder Skinner marine Unaflow engines. They were of a German design that produced no back pressure. This allowed them to be reversed instantly. When docking a boat, particularly without the aid of a tug boat as the cross lake ferries did, being able to have quick response to throttle commands is important. The new boat was named the *City of Midland 41*. Midland, Michigan was the home of an important Pere Marquette customer, Dow Chemical Company.

City of Midland 41, the first of the modern boats.

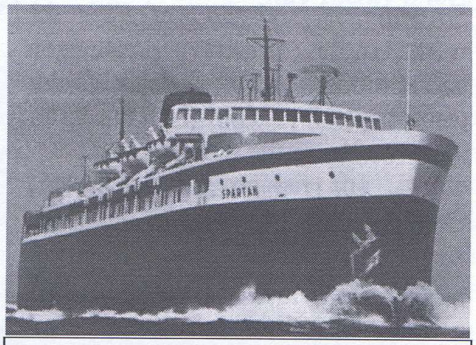
Thus the PM entered the war years of the 40s with six ships - *Pere Marquette 18 (II), 21, 22, City of Saginaw 31, City of Flint 32* and *City of Midland 41.* Business was brisk, but nothing like the C&O experienced out of Newport News. The Lake Michigan car ferries operated too far north of the major manufacturing areas of the United States. The boats were used by the U.S. Coast Guard as they did their normal crossings as training vessels with Guardsmen learning seamanship during 60-day assignments on the ferries. The boats officers were even given commissions.

In 1942, the City of Saginaw 31 was the first commercial boat on the Great Lakes to be equipped with radar. Soon, all of the PM ferries were equipped. This practice to have the latest navigation aids on the boats was practiced by the PM and later by the C&O.

1947 brought the merger of the Pere Marquette Railway into the Chesapeake & Ohio Railway. The stack insignia for the PM had always been a black stack with a large red ball. The C&O used a circular yellow ball with the blue C&O herald lettered "C and O for Progress."

The C&O studied the cross lake operation and wanted to improve it. It found the old 14 mph boats to be uneconomical and wanted all the boats to be capable of 18 mph. In 1951, it placed orders for two new boats to be bigger and able to carry more passengers than the *City of Midland 41*. The Christy Corporation of Sturgeon Bay, Wisconsin was awarded contract with a price of $5,000,000 for each boat The new boats had 60 cabins, a lounge seating 200 and a dining room. They were powered by four-cylinder compound Unaflow engines with a total horsepower of 7650. Launched in 1952, the new boats were named *Spartan*, to honor Michigan State University, and *Badger*, to honor the University of Wisconsin. They never were officially given numbers, but the *Spartan* was often referred to as the 42 and the *Badger* as the 43,

These were the last large coal-fired passenger steamers ever built in the United States. The railroad had already started to convert its locomotive fleet to diesels, but chose to stay loyal to coal, the largest commodity that it carried, for the new boats. It was a mistake on many levels. They required a minimum of 56 employees in the winter; and it grew to 70 in the summer as a result of the additional passengers. Oddly enough, the union that manned the boats pressed the railroad to power the boats with diesel engines, but the C&O, normally known to make very smart financial decisions, did not listen to the union. It was also an environmental mistake that even the



The *Badger* and the *Spartan*, above, were the last of the coal-fired passenger steamers built in the United States.

current Operator of the last boat is having to fight. The boats dumped their waste into the lake - human waste, garbage from the kitchen, bilge water containing oil, water that had been used in the boiler and still was 25 degrees warmer than the temperature of the lake and ash from the burning of the coal. The C&O did later correct some of these by using holding tanks for the human waste and bilge water that it then took to Ludington for the municipal sewer system. It also started carrying the garbage back to port to off-load. But of course, the City of Ludington did not handle this waste for free and it added to the expense of the operation.

To update the *Pere Marquette 21* and *22* to 18 mph, they were sent to Manitowoc in 1953 and had the more modern and powerful Unaflow engines installed in them. An additional 40-foot section was added to the hull to increase the number of railroad cars they could carry to thirty-four. When they returned to service after being refitted, the *Pere Marquette 18 (II)* was sent to scrap.

Thus the C&O now had seven 18 mph boats. The *Spartan* and *Badger* were assigned to the Milwaukee run, and *the City of Midland 41* to the Manitowoc (CNW) run. The other boats, *Pere Marquette 21* and *22, City of Saginaw 31* and *City of Flint 32* with their smaller passenger accommodations, were used on the runs to Manitowoc (SOO LINE) and Kewaunee.

By 1961, the C&O car ferries were carrying 132,000 railroad cars, 54,000 automobiles and 153,000 passengers. Most of the Milwaukee railroad business was to customers within the Milwaukee switch limits, while the traffic to Manitowoc and Kewaunee was to by-pass the congestion of Chicago.

PM 21 after being lengthened and fitted with new engines. It even got a new single stack.

In 1967 the *City of Flint 32* was put in storage; and she was sold to the Norfolk & Western Railway who cut her down to the car deck, removed the engines, renamed her the *Roanoke* and used her with a tug and barge in the cross-river operation between Detroit and Windsor. The *City of Saginaw 31* was sent to Manitowoc in 1971 for overhaul. While in the boatyard, she caught fire. It was determined she was beyond economical repair and was scrapped in 1973. Also in 1973, the *Pere Marquette 21 and 22* were both sold and both ended up in barge service in South America.

When built, the *Spartan* and *Badger* were expected to carry 34 cars. However, as railroad cars grew from 40-feet to 50-feet- to 60-feet to 86 or 89-feet, the capacity of the boats became smaller. Typically, they were able to handle only 25 cars - back to the original design number of the first car ferries. But, modern trains had grown larger at the same time as the cars grew. By the 1970s, it was not out of normal for trains to have 100 or more cars.

In 1962, the railroad looked at putting diesel engines in the *Spartan* and *Badger*. The cost was projected to be $10,000,000 for just the three newest boats. It was determined the railroad had much better things to do with that kind of money since the boats would still have been a marginal operation at best.

The ferries each consumed 70 tons of coal per day. When the railroad was operating seven boats, this required 10 to 15 cars of coal a day. When the author was assigned to Midland, Michigan in 1969-70, it was normal to see a cut of 7 to 12 cars of coal on trains out of Toledo destined to Ludington for use on the boats. The ideal car was a 50-ton hopper in the series C&O 20000-20599. These were often referred to as "Rodger Ballast Cars." They had side and center dump doors that allowed the coal to flow out of the cars and cleanly into the coal bins of the boats. However, they were built in 1924 and were rapidly dropping out of service. Conventional hoppers were also used, but they were much messier to unload and required manual labor to clean up the overflow on the decks of the boats.

During the late 60s and into the 70s, the railroads of Chicago started to schedule more and more run-through freight train operations. This reduced the terminal congestion and therefore the amount of time that it took to get traffic through the gateway. As a result, the amount of traffic for the ferries started to drop. The traffic on the C&O boats peaked in 1959. By 1972, it was costing the C&O $10,000,000 a year for the operation of the cross lake ferries. The cost of producing a 1000 net ton-miles on the C&O boats was $55.45 in 1975.

A train could produce 1000 ton-miles for under $5. Car loadings on the ferries continued to drop. In 1970, there were 77,387 carloads and in 1977, it was only 26,987 carloads. Attempts were made to the ICC to allow the ferries to be abandoned, but with no success. In 1980, the Milwaukee route was eliminated following the end of the summer season. Manitowoc service was discontinued shortly thereafter. Kewaunee was kept by order of the ICC only to protect the Green Bay & Western that depended on the car ferries for much of its traffic.

On July 1, 1983, the C&O, then operating under the name Chessie System, leased the three remaining boats (*City of Midland 41*, *Spartan* and *Badger*) along with the port facilities for six years to the Michigan-Wisconsin Transportation Company. Of the three boats, the *Spartan* had been laid up since 1979 and was only used for parts to keep the other boats running. The MWT learned what the Chessie System already knew as the traffic continued to drop. In 1989, there were only 2500 freight cars handled or less than 10 per crossing. Service to Kewaunee was embargoed when the *Badger* began scraping the lake bottom in the harbor and the MWT's insurance company advised it to end service. The last ferry operated out of Kewaunee on November 16, 1990.

The *Badger* was put in storage at Ludington in 1984, When the *City of Midland 41* failed its Coast Guard inspection in 1987, the *Badger* was refurbished and put back in service. The *City of Midland 41* made its last crossing in November of 1988 and was stored in Ludington for nine years. Finally in 1997, it was converted to an unpowered barge.

The Badger departing Ludington as it appears today for its current owner LMC. *LMC photo*

The Michigan-Wisconsin Transportation Company filed for bankruptcy in 1990. Ludington native, Charles Conrad formed the Lake Michigan Carferry Service (LMC) to continue the cross lake service, but without carrying any railroad cars. LMC refurbished the *Badger* with renovated and upgraded passenger accommodations. In 1995-96, a queen's deck was added forward to increase the automobile capacity. She continues service between Ludington and Manitowoc only between the months of May and October.

The environmental concerns of a coal-fired steam boat continue to haunt the *Badger*. She currently is operating on a consent decree with the U.S. Department of Justice and Environmental Protection Agency to end the discharge of ash within two years. That came after a $25,000 fine for violating mercury water quality standards in 2012.

Meanwhile the *Spartan* remains rusting at a slip in Ludington providing parts for its sister boat.