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# A Piece of the Action

by Henry T. Koch

**AUTHOR'S NOTE:** I owe several people a thank-you for their time and help in my research. Because very little has been written about Manitowoc submarines, interviews with Messrs. Ray Young, Charles Wedel, Stephen Petreshock, and Burkhard Laas were important sources of information. I only regret that the scope of this paper can't include more than a sample of their help.

The Manitowoc Maritime Museum also deserves special appreciation. The staff opened its library and files so that I could use unpublished letters and bulletins, as well as newspaper articles.



*The Manitowoc Shipbuilding Company's band regularly held noon concerts to help keep workers' morale high. Big bands and celebrities also came to Manitowoc for the same purpose. In this photograph, the company band performs in front of the shipyard's safety building. Photo: Manitowoc Maritime Museum Collection — Mrs. Harry Berns, donor.*

**EDITOR'S NOTE:** Henry T. Koch lives in Cleveland, Wisconsin, and is a recent graduate from Northwestern College in Watertown, Wisconsin. His schooling was in preparation to attend Wisconsin Lutheran Seminary in Mequon, Wisconsin. Earlier this year, Mr. Koch's article won one of four cash awards presented by the Dr. John Henry Ott Awards Committee at Northwestern College.

This article, which highlights the submarine construction program in Manitowoc, comes at an appropriate time. On August 24-25, the crews of 20 Manitowoc submarines and the COBIA will hold reunions and attend the Twelfth Annual International Submariners Memorial Service in Manitowoc. Pride runs deep, not only for the submariners who served on Manitowoc boats, but for everyone in the community who helped make the submarine construction program a success.



Most communities and regions of the United States have their own distinct character. Mention Nebraska and one pictures plains covered with cattle or crops. Arizona is hot and dry, but Alaska is cold and remote. Wisconsin means dairies and cheese, right? That's generally true, but there are exceptions. Manitowoc, Wisconsin is one of these exceptions. It is a city of 33,000 people, located 75 miles north of Milwaukee along Lake Michigan. Although Manitowoc County has its share of farms, its claim to fame is shipbuilding. Of particular interest is Manitowoc's shipbuilding forty years ago, when the United States was in the midst of World War II.

Before we consider Manitowoc's role in World War II, some history of Manitowoc's development will be helpful. Records trace Manitowoc back to 1795. In that year the North-West Co. began fur trading at the Manitowoc River's influx to Lake Michigan. Development continued, and Manitowoc received its charter in 1870.<sup>1</sup>

Shipbuilding has been part of Manitowoc since 1847. In that year Joseph Edwards launched the sixty-ton schooner, CITIZEN. Manitowoc shipbuilders gained experience year after year, and as production grew, so grew Manitowoc's reputation. It received an extra boost just after the turn of the century. It was the spring of 1902 when two employees of Chicago Shipbuilding Company, Charles C. West and Elias Gunnell,

### ... submarines were totally new to Manitowoc.

began their own shipbuilding company in Manitowoc.<sup>2</sup> Progress brought changes to shipbuilding, but West and Gunnell kept pace. Manitowoc's transition to steel shipbuilding, as well as dredging the river, kept shipbuilding viable in Manitowoc.

As World War II approached in Europe and the Pacific, the Navy began stepping up ship production. East coast and west coast shipbuilders couldn't handle the orders, so the Bureau of Ships called Charles West to Washington to discuss the role of Manitowoc shipbuilding in

the imminent war. West was ready to explain Manitowoc's good reputation in order to secure favorable contracts for minesweepers or landing craft construction. West discovered he didn't have to "sell" Manitowoc Shipbuilding Co. to the U.S. Government – officials already had respect for its reputation. As far as Charles West was concerned, the government already had too much confidence, especially when West was prodded into accepting a contract for submarine construction.<sup>3</sup> The government gave Manitowoc Shipbuilding time for retooling (to the end of October, 1943 for the first submarine), but submarines were totally new to Manitowoc.<sup>4</sup> Submarine construction had not been easy even for the large companies on the Atlantic coast. It was true that the submarine had been developed in America, but German and English factories had surpassed United States technology.<sup>5</sup> Some of the Navy's pressure can be understood by looking at the United States submarine fleet at the beginning of World War II. Of 113 boats available, only 40 United States subs were modern weapons. There were only three submarine construction companies, Electric Boat, Portsmouth N.Y., and Mare Island N.Y., and they had their hands full.<sup>6</sup> Just as the German "Kriegsmarine" saw potential for subs against British shipping, so also the United States looked to the submarine to cut off Japan's supply lines. Manitowoc workers would have to get experience on the job.

Inexperience wasn't the only hurdle Manitowoc Shipbuilding had to overcome. The tubular sections of the hull had to be welded to one another. There was nothing easy about swinging 50-60 ton sections of submarine in place for welding; a crane would have to be developed before work could proceed on the subs.

When the submarine was completed, another obstacle would face the shipyards. The problem concerned launching the finished submarine into the Manitowoc River. It was too narrow and too shallow for the typical "down the ways" launch, and the only other method was a "side

flop."<sup>7</sup> Conventional ships had been slid broadside into the river, but a submarine had never experienced that type of launch.

The problems didn't end after the submarine was launched. It was supposed to travel to Chicago, float down the Illinois waterway, then continue down the Mississippi to New Orleans. It was no problem to get out of Manitowoc – the 8th and 10th street drawbridges would give enough clearance. The completed submarine was too high for Chicago's fixed bridges, but too deep for the shallow waterways. Apparently, any submarine Manitowoc Shipbuilding could make would be trapped in Lake Michigan.

That was quite an obstacle course for a small company to manage, but the demands of war spurred the company to action. Piece by piece the path was cleared for submarine construction.

The Navy's demand for as many submarines as possible caused Manitowoc Shipbuilding Co. to set aside four building berths. Two of the berths accommodated two submarines each, so six subs were under construction at a time. As soon as a sub was launched, construction on another boat began.<sup>8</sup>

The rapid growth also demanded more workers. By 1943 Manitowoc Shipbuilding Co. had trained and hired 385 women to work as welders or machinists.<sup>9</sup> Farmers also helped out as welders. Most farmers were used to repairing and welding their own farm equipment. When they came into Manitowoc to work evenings, they brought along years of experience.<sup>10</sup> Nearby communities provided the rest of the workers so that Manitowoc Shipbuilding employed 7,000 people at the peak of production.<sup>11</sup>

The rapid expansion also created a boom for housing. A federal housing project was started in November of 1941. By March 1944, a new section of Manitowoc, known as Custerdale, was completed. The well-built wood houses in Custerdale boarded 600 families, 2,200 people in all.<sup>12</sup>

Now that building berths and

1. Office of Chief of Naval Operations, Navy Department. (May 1, 1968).

2. The Manitowoc Company, *Seventy-fifth Anniversary Report*, 1977, p. 25.

3. *Ibid.*, p. 26.

4. *Ibid.*, p. 28.

5. Keith Wheeler, *War Under the Pacific* (Alexandria, Virginia: Time-Life Books, 1980), p. 16.

6. Henry T. Lenton, *American Submarines* (Garden City, N.Y.: Doubleday & Company Inc., 1973), p. 5.

7. Dee Allen, no title, Naval Submarine Base New London, May 21, 1971.

8. The Manitowoc Company, *op. cit.*, p. 27.

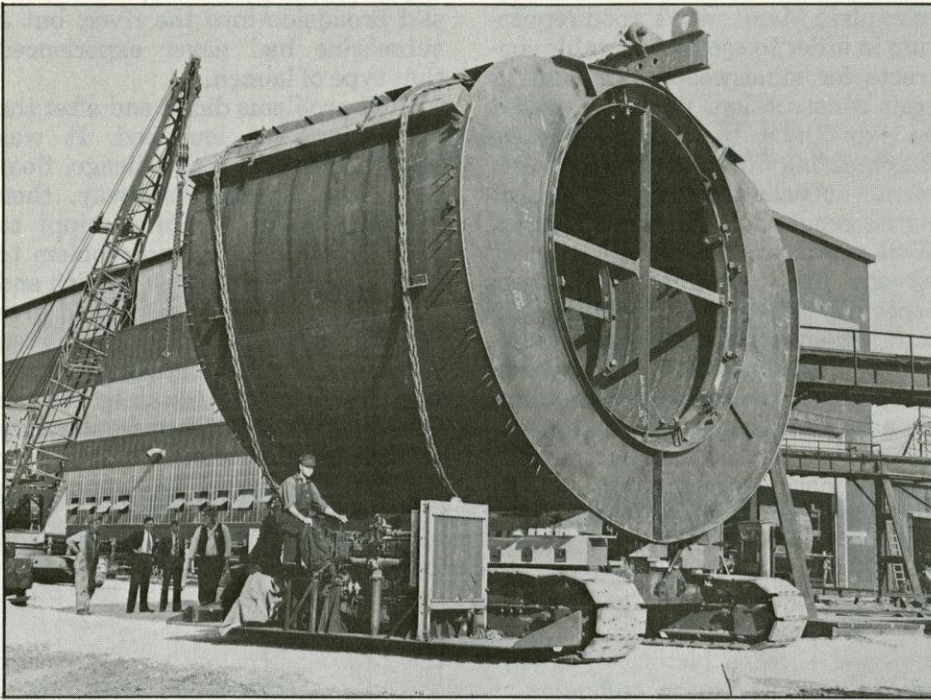
9. *Ibid.*

10. Interview with Ray Young, April 20, 1984.

11. The Manitowoc Company, *op. cit.*, p. 29.

12. Information from Manitowoc Maritime Museum file, Manitowoc during World War II.





Manitowoc cranes played an important role in submarine construction. After a hull section was carried to its berth on a crawler transporter, two specially designed cranes lifted the 60 ton sections onto its keel blocks. Photo: Manitowoc Maritime Museum Collection — Mrs. Harry Berns, donor.

workers were available, Navy and shipyard officials could concentrate on quality construction facilities.

One of the primary concerns was the quality of welds joining the hull sections. The welds had to hold the sub together through crushing depths and explosive depth charges; brittle welds couldn't be tolerated. Designers knew that Wisconsin weather swung between extremes of heat and cold. That sort of temperature instability only invited faulty welds. Manitowoc's solution was covered staging that enclosed the hull in a uniform, warm environment. In cold weather infrared lamps heated the joints to assure solids welds.<sup>13</sup>

### ...infrared lamps heated the joints to assure solid welds.

While some of the shipyard men ironed out the welding problems, another group undertook development of new cranes to handle the submarine sections. A single crane couldn't manage the sections unless it had unwieldy dimensions. With the help of Twin Disc Clutch Company of Racine, Manitowoc developed smooth, powerful, gas-driven cranes to replace the steam-driven cranes. Two of these new cranes could team up and keep construction crews

busy.<sup>14</sup> This innovation yielded a bonus: the cranes could also rotate the hull sections so that welders could always work with their torches aimed downward in the most efficient way.<sup>15</sup>

The next logical step was development of a safe launch. A model basin of the Manitowoc River was made to scale with a twelve foot submarine model. Trim and displacement was adjusted to resemble the full-scale submarine. The model was tested until the engineers could predict the launch of the real submarines.<sup>16</sup> The first launch date came on April 30, 1942, when the PETO flopped into the Manitowoc River. One sub commander called the sideways launch "effective, but most undignified."<sup>17</sup>

As in the case of the cranes, the Manitowoc development of the sideways launch yielded a bonus. The sideways launch allowed submarines to be built on a level keel, so torpedo tubes, intake valves, and periscopes could be aligned with exceptional accuracy. The handicap of Manitowoc's facilities actually helped the submarines become the finest in the fleet.<sup>18</sup>

14. *Ibid.*

15. Keith Wheeler, *op. cit.*, p. 52.

16. The Manitowoc Company, *op. cit.*, p. 27.

17. "Finny Symbols Ride Their Subs Into Deep," *The Milwaukee Journal* (May 5, 1946).

18. The Manitowoc Company, *op. cit.*, p. 27.

13. The Manitowoc Company, *op. cit.*, p. 27.



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Now that a submarine was in the water, it was almost ready for action. Final assembly was undertaken, and then the submarine was ready for trials on Lake Michigan. Although weapons trials were secretive in World War II, retired torpedoman 1st class Stephen Petreshock remembers his experience on board the U.S.S. REDFIN: "We would take the boat up to Kewaunee and away from the shore. There, in a deeper area of the lake, we would take the submarine down fifty feet at a time ... Practice dives went to 420 feet."<sup>19</sup> Representatives from the shipyard came along to see any problems firsthand. An important part of the lake trials was torpedo practice. Torpedoes with water-filled warheads were launched against "victims." If the torpedo passed under the target as directed, the run was successful. At the end of its run the water was expelled from the warhead and the torpedo floated to the surface. The Coast Guard cutter TAMARACK returned the valuable (\$10,000/piece) torpedoes for further use.<sup>20</sup>

When the crew and submarine were considered ready for action, the submarine was prepared for its 1,000 mile trip to New Orleans. The tall periscopes and periscope shears (protective casing) were removed and secured to the deck in order to lower the sub's height. While the submarine traveled south to Chicago with a skeleton crew, the remaining crewmen enjoyed a few extra days of leave.<sup>21</sup> After squeezing under Chicago's bridges partially submerged, the sub was floated into a special dry dock at Lockport, Illinois, for the Illinois waterway and Mississippi River transit.<sup>22</sup>

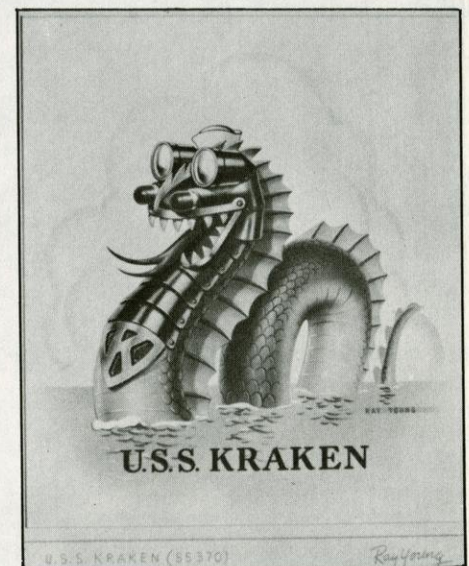
**...awarded the "E" for excellence on April 3, 1942...**

The first Manitowoc submarine, the PETO, reached New Orleans on January 11, 1943, 288 days ahead of schedule. The original order for ten submarines was filled twenty-one months ahead of schedule, so the Navy ordered more. The Navy was so pleased with Manitowoc Shipbuilding Co. that it awarded the "E" for excellence on April 3, 1942 and renewed the honor five times. Evidence

of the worker's morale can be found in the company magazine, *Keel Block*, January 1943. The different construction areas like the tin shop, paint shop, and boiler works competed to buy the most war bonds. Eighty-three percent of the employees were buying bonds, and several of the shops had reached the goal of ten percent of wages invested in war bonds.

While the first ten submarines were still being built, the Navy sent its order for twenty improved submarines. The first ten submarines had been in the "Gato" class and had a maximum diving depth of 300 feet. The newer "Balao" class was designed to operate at 400 feet. The only other important distinction lay in the power plants. Both submarine types were driven by a diesel-electric system, but the "Gato" class used a reduction gear with the propellers that made noise. When a submarine was trying to sneak away from Japanese destroyers on the surface, the grinding gears could give it away. All that the "Balao" class did was drive the propellers directly from the motors without a gearbox.<sup>23</sup> Manitowoc continued construction of the "Balao" submarines until the end of the war. A total of 28 sub-

23. Henry T. Lenton, op. cit., p. 79.



Ray Young of Manitowoc, designed insignias for ten Manitowoc submarines. His insignia for the U.S.S. KRAKEN and other submarines became famous and were featured in the Time-Life book, *War Under the Pacific* (1980). Photo: Herb Koepke Collection, Manitowoc Maritime Museum — Herb Koepke, donor.

19. Interview with Stephen Petreshock, April 23, 1984.

20. Charles Cheadle, no title, *The Milwaukee Journal*, 1945.

21. Stephen Petreshock, loc. cit.

22. Dee Allen, loc. cit.



marines were built. The 29th and 30th submarines were cancelled as the war drew to a close.

In order to understand the ships built by Manitowoc better, we should look at a few of the important specifications. The submarines weighed in at 1,526 tons on the surface. When the submarines took in sea water to submerge, they displaced 2,424 tons. Their length was 311 x 27 x 15 feet. The familiar German U-boats were smaller in comparison, varied in designs from 250-750 tons, and had a length of 220 feet.<sup>24</sup> United States submarines used diesels on the surface, and batteries powered the submarines underwater. A submarine with a good crew could go far on its 118,000 gallons of fuel. Mr. Charles Wedel, a former chief engineman, explained the submarine's formula for a long cruise. The term used was "80/90," and referred to cruising at 80% speed and 90% efficiency. If, however, flank (maximum) speed was required, fuel use was double for only a small gain in speed.<sup>25</sup> Although the submarines had anti-aircraft guns and a 3-5 inch deck gun, the main weapon was the torpedo. Along with six tubes in the bow, four tubes were located aft. A total of twenty-

four torpedoes were fitted on board the submarine to keep the submarine armed throughout its long patrols.<sup>26</sup> Since the narrow submarines had 80-85 men on board, there was little room for food storage. In order to supply a sub with ninety days of food, it was common practice to fill any hole or space with tins of provisions like sugar and coffee. Apparently it was common practice to store the canned food in a layer on the floor. The crew simply walked on the cans until they ate their way to the deck.<sup>27</sup>

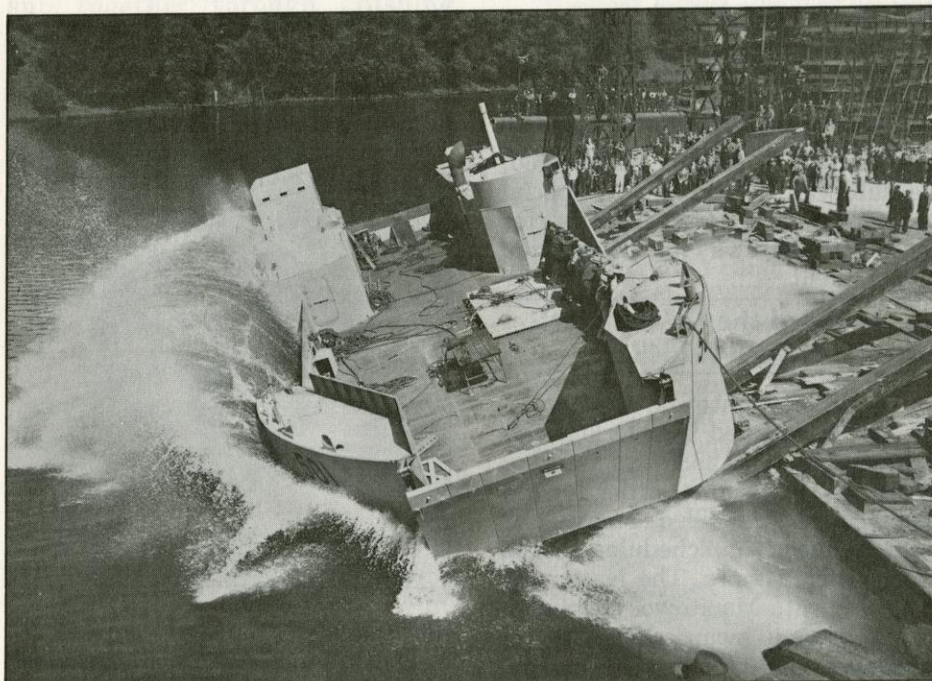
Not only did high quality workmanship make Manitowoc subs famous, but also Manitowoc's custom-made emblems attracted submariners. Each World War II submarine was named after a fish, and many subs had their own emblems. When Walt Disney stopped designing emblems for submarines, Ray Young won the job in Manitowoc. Young's work at the company was cabinet design, but his submarine emblems soon eclipsed his other work. His emblems became popular for several reasons. First of all, he spent time researching the fish for his emblem. Each emblem reflected the characteristics of the sub's namesake. Then Young

24. Interview with Burkhard Laas, April 25, 1984.

25. Interview with Charles Wedel, April 23, 1984.

26. Stephen Petreshock, loc. cit.

27. Charles Wedel, loc. cit.



Manitowoc Shipbuilding Company was the lead yard for the construction of LCT5's and LCT6's. Thirty-seven of these landing crafts were built in Manitowoc. More importantly, these vessels were designed by Manitowoc Shipbuilding Company, which was also responsible for their production at other shipyards in the country. Photo: Manitowoc Maritime Museum Collection — Mrs. Harry Berns, donor.

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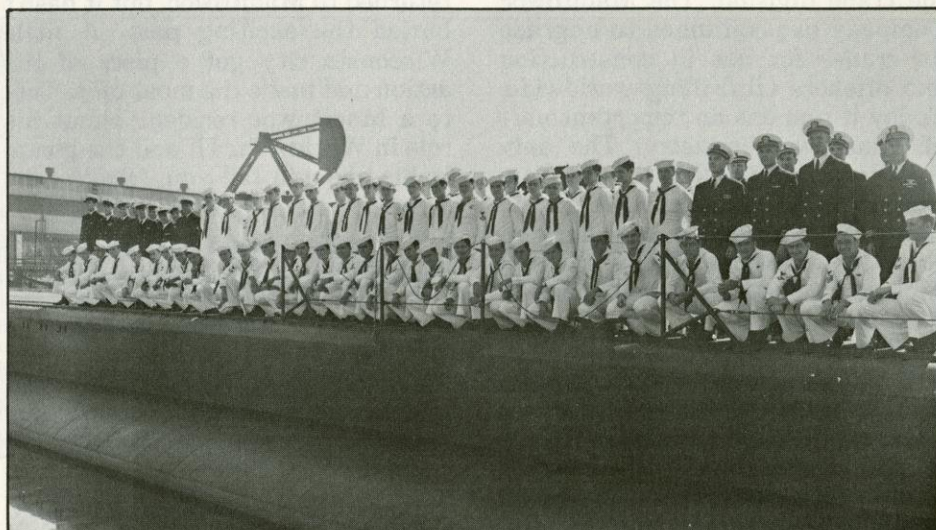
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*The officers and crew of the U.S.S. KETE pose on board their boat. The KETE was one of four Manitowoc submarines lost during World War II. Photo: Manitowoc Maritime Museum Collection — Manitowoc Shipbuilding Co., Inc., donor.*

tried to look at the design from the crew's perspective. He came up with threatening designs that crews loved. Of course, an artistic touch didn't hurt his designs either. Young made logos for the last ten Manitowoc submarines, and even accepted a few jobs from other shipyards.<sup>28</sup>

The \$6,000,000 submarines that Manitowoc sent to war performed very well. Seventeen of the submarines were responsible for 130 Japanese vessels sunk and a total of 486,233 tons. The fifth submarine from Manitowoc, the RASHER, led all United States submarines but one in tonnage sunk.<sup>29</sup> Four of the submarines were lost in action: ROBALO, GOLET, KETE, and LAGARTO. Many of the other submarines remained active after the war in the US Navy or allied navies. The HARDHEAD and JALLAO served in the United States fleet until 1973, and the LAMPREY and MACABI were recently used for parts by Argentina to keep two other World War II submarines active in the Falklands war.<sup>30</sup>

**...also asked to design and lead the production of 450 landing craft.**

Manitowoc's contribution to the effort in World War II wasn't limited to submarines. Eight days after Pearl Harbor, Manitowoc Shipbuilding Co. received a top-priority order

for six of its largest cranes to help salvage operations at Pearl Harbor. Two hundred and seventy-eight more cranes were built during the war for the Navy and Army. Mr. West's company was also asked to design and lead the production of 450 landing craft. Manitowoc Shipbuilding Co. answered by developing the LCT5. When the LCT5 order was filled, the Navy asked Manitowoc to design the next series, LCT6. Manitowoc shipbuilding produced thirty-seven of the landing craft, fourteen auxiliary motor minesweepers, nine yard oilers, six subchasers, and two ocean tugs. Toward the end of the war the company produced 287,500 ammunition boxes in record time. This job helped Manitowoc Shipbuilding Co. retool from heavy war construction to post-war light metal fabrication.<sup>31</sup>

Manitowoc ship construction continued in the 1940s and 1950s, but construction never equaled the pace of the wartime shipyards. Manitowoc remained connected with shipping through car ferry service by the SPARTAN, CITY OF MIDLAND, and BADGER. Unfortunately, the Manitowoc River couldn't expand with the shipyards as Great Lakes freighters became larger and larger. The Manitowoc Shipbuilding Co. was forced to split up to survive. Shipbuilding moved north to Sturgeon Bay. Kelvinator Company bought up the refrigeration division. All that remained in Manitowoc was

28. Ray Young, loc. cit.

29. Keith Wheeler, op. cit., p. 202-205.

30. Henry T. Lenton, op. cit., pp. 94-95.

31. The Manitowoc Company, op. cit., p. 29.



the crane division. The Manitowoc Company has continued to upgrade its cranes for use in construction and offshore oil drilling worldwide. Today it remains an important part of Manitowoc industry. The only significant shipbuilding is done by Burger Boat Company. Rather than compete in merchant marine construction, Burger builds custom yachts for wealthy individuals or corporations.<sup>32</sup>

The glory years of Manitowoc have left their mark on the community. The sturdy houses of Custerdale remain, and street names like "Rasher" and "Raton" recall the names of Manitowoc's subs. The most visible reminder is a World War II submarine, the USS COBIA, which rests downtown in the Manitowoc River. This gift to the city reminds younger generations of Manitowoc's honorable past. Another center of Manitowoc's history is the Manitowoc Maritime Museum. The museum takes visitors step by step through the city's past and has a special library on Great Lakes shipping. A combined tour of the museum's displays and the COBIA brings history to life. Add a few interviews with people who made Manitowoc's history, and World War II doesn't seem very long ago.

The quiet Wisconsin life has

32. Ray Young, loc. cit.

returned to Manitowoc, but it hasn't buried the exciting past. A little Wisconsin city got a piece of the action and made the most of it. Talk to a Manitowoc resident about his role in World War II, and the gleam in his eye will tell you, "Pride runs deep."

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## SHORT FEATURE

### When the Automobiles Came Aboard

by James H. Draucker

EDITOR'S NOTE: James Draucker is a retired Great Lakes sailor who now lives in Auburn, New York. The RICHLAND QUEEN was built in 1898, and launched as the AMAZONAS. She was renamed the RICHMOND QUEEN in 1916, and in 1933 her name was changed to PETCOL.

Shortly after the First World War, several vessels began transporting automobiles on the Great Lakes, and the RICHLAND QUEEN was one of these vessels.

I was a wheelsman on the Steamer JACOB T. KOPP. The first mate was Captain John T. MacNally. The following spring, John called me and said, "A couple of persons who are in the cargo hauling business have purchased a wooden steamer laying up in Tonawanda. They are going to refurbish her and start carrying autos from the manufacturer to the dealers." He was going to be the Captain, and would I be a wheelsman. That intrigued me, as I thought back.

As a young person, I was in lumber as a grader. I saw wooden steamers such as the WINNIPEG, FLEETWOOD and AMAZONAS bringing lumber from Minnesota and Canada to the Tonawandas. I thought, "Oh gosh, she is old!"

Then I thought back to when I was 10 and 12 years of age. I had the good fortune in 1911 of taking a trip on the wooden Steamer F. R. BUELL, loading coal in North Tonawanda, then delivering it to Kenosha, Wisconsin, then on to Manistiquie, Mich-



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