A “REVOLUTION IN POWER” — MARINE INBOARD ENGINES

By Richard J. Dodds, Curator of Maritime History, and Richard A. Day Jr., Heritage Engine Collection

Part II: Gasoline to Diesel

[Editor’s Note: This is the second of two articles on marine inboard engines. These articles, along with the two articles on outboard engines that appeared in 2001, present an interesting history of popular power sources for small boats.]

According to Motor Boat magazine of April 10, 1924, by 1904 eight thousand marine engines had been installed up to that time, the greatest number in “pleasure boats.” While early motor cruisers closely resembled the steam and naphtha launches that preceded them, the gasoline engine would quickly lead to a whole new generation of recreational boat designs. Although not widely known, a number of engine manufacturers, like the Palmer Bros., also built the launches to go with their engines. The Rudder magazine of December 1901 told its readers, “There has been ever since the cheap motor came into being a large and urgent demand for hulls in which to put it. Every spring there is a launch-hull famine, and next spring the demand will be greater than ever before.” Palmer built its first production boat around 1895 and its last about 1919. By that time the industry practice had changed — to those companies that built hulls and those that built engines. This practice permitted owners and designers to select an engine to be installed in the hull under construction.

Motor boats democratized what had been largely an upper class recreation of yachting, since the cheaper motor boats could be used by anyone and could go anywhere at will, avoiding the unreliability of sail. No more the high cost of steam power with its requirement for a licensed engineer. By 1901 The Rudder magazine had published How to Build a Motor Launch by C. D. Mower: “Any person with the slightest mechanical knowledge and skill can construct a serviceable and good-looking boat from this book.” The magazine also sold How to Build a 3 H.P. Launch Engine. For those on a budget but not inclined to build their own engine, a Motorgo could be purchased from the Sears Roebuck & Co. catalogue. This engine was installed in many small boats, formerly rowed or sailed.

In 1904 the National Association of Engine and Boat Manufacturers was organized to promote the welfare of the industry. That same year Motor Boat magazine was started to champion the interests of the recreational and commercial power boater. In 1907 Motor Boating magazine was founded, and the first exclusively motorboat show was held in New York City. (Both competing magazines were published up into the 1950s.) Among the landmark efforts was the fighting off the imposition of stringent government controls over private yachtsmen and watermen with licenses and government regulations. Unlike the European countries, which did impose a wide variety of restrictions, none of that took place in the United States, largely as the result of the efforts of the NAEBM. The European yachtsmen suffered greatly under government rules that for many years held back the widespread development of the industry in Europe.

As more powerful engines came on the market, boat builders strove to develop more efficient hulls, in particular the V-bottom displacement hull. Organized racing began with the formation of the American Power Boat Association in 1904. It might be noted that the first mixing-the-lubricating-oil-in-the-fuel proponents recognized in the popular press of the day were Messrs. Pierce, Nye, and Budd, well-known marine racing engine designers.

Runabouts and fast launches had their golden days in the 1920s, with well-known names like Hacker, Gar Wood, Chris-Craft, and Dodge. Horace and John Dodge, of Dodge automobile fame, began building the first Dodge “Watercar” in 1924 in Detroit. Business did so well that they built an entirely new factory in Newport News, Virginia, in 1930. The plant of the Horace E. Dodge Boat and Plane Corporation was described as “the largest of its kind in the world.” Dodge specialized in small runabouts equipped with Lycoming and Gray four-cycle engines. In the midst

Continued on page 6
Recent Acquisitions to CMM Library

Calvert Marine Museum’s library and archives is one of the region’s most important research facilities, built up over twenty-five years by generous donations and selective purchases. One of the more significant recent acquisitions is a set of original architectural drawings, by architects Maughlin & Sons of Baltimore, of the mansion built for Frederick L. Barreda on Drum Point soon after 1870. The drawings were donated by Mrs. Sally Taylor of Mill Valley, California, the great granddaughter of Frederick Barreda.

Mr. Barreda was a Peruvian diplomat who made his fortune from the importation of guano in the mid-1800s. He started first in Baltimore where he joined in a partnership with two Maryland importers to buy land in Calvert and St. Mary’s counties. The partnership bought about 2,500 acres on Drum Point, but Mr. Barreda soon moved to New York and had little to do with the property. When one of the Baltimore partners died in 1868, Mr. Barreda bought the partnership interest in the Drum Point property and arranged for the building of a large house – three stories with a cupola on top. (He had other real estate interests in New York City and Newport, Rhode Island.) After financial losses in 1873, Mr. Barreda moved his family to Calvert County and began farming the Drum Point property, but left in a few years for San Francisco to pursue other business interests. The Barreda mansion remained in the family until 1942, but it was finally torn down in the 1950s.

Although the museum has photographs of the mansion, the details of the construction were not documented. Last spring Mrs. Taylor came across the plans in her father’s papers and offered them to the museum. They were accepted quickly and gratefully, documenting an important feature of the local community. According to local lore, the mansion was the first residence in the county with indoor plumbing. Interestingly, the building plans now appear to verify these anecdotal reports. The third floor shows a water tank, with a bathroom on the second, and sinks for the kitchen and butler’s pantry on the first floor.

It is rare these days that new documentation comes to light on boat builders in Solomons during the golden era of shipbuilding in the late nineteenth century. Thanks to Joe McDonagh of Columbia, South Carolina, we can add a little more. His grandfather, Martin P. McDonagh, leased part of the Thomas Moore shipyard in Solomons for five years, starting in October 1894. The museum knows of at least five commercial sailing vessels and yachts built by McDonagh during this time. Donated to the archives is a rare original letterhead used by M.P. McDonagh. The handsome letterhead proclaims: “Ship and Yacht Builder. Steam Launches a Specialty. Repairs made to Vessels with Dispatch and Care.” Mr. McDonagh also provided a photograph of his grandfather.

On a final note regarding recent donations to the library, the museum is pleased to announce that it now the repository for the LCI [Landing Craft Infantry] National Association archives. In June of this year, the museum and the association entered into an agreement whereby CMM will house the documents, correspondence, memoirs, photographs, and printed materials donated by members of the LCI National Association. The museum will report twice yearly to the association on donations, and make available copies of items to members on request. Solomons’ role in training amphibious troops during World War II made CMM a natural choice for the archives.

(Richard Dodds) 

VOLUNTEER COUNCIL MEETS FOR AWARDS AND ELECTION

At its annual meeting on September 9, some fifty members of the Volunteer Council attended a short meeting in the museum auditorium, followed by refreshments in the lobby. The outgoing president, Richard Rogers, reported on the highlights of the year, followed by comments from Doug Alves, museum director. Exemplary Service Awards were presented to Ruth Showalter, for her work with the Estuarine Biology department, and Al Lavish, for his long association with the maritime history program and work with the museum’s small craft. Leadership of the council was then passed to new officers elected at the meeting: Lee Gandy, president; Dave Peterson, vice president; Maarja Gandy, treasurer; Nancy McCabe, recording secretary; and Debra Carlson, corresponding secretary. The annual meeting closed with hearty thanks to the council and all museum volunteers from Leslie King, volunteer coordinator.
MEMBERS’ YULE PARTY

Enjoy a fun-filled holiday celebration with family and friends at CMMS’s annual Members’ Yule Party. Featuring the Babies in Toyland theme, this year’s festivities include finger food and desserts, holiday music, games, a performance by Nicolet Whitmore, and a special visit by Santa and Mrs. Clause. Please join us for this exciting evening. Invitations will be mailed in November.

December 7, 2003

CRUISE ABO ABOARD THE QUEEN MARY 2

June 19-29, 2004

The Calvert Marine Museum is excited to announce a cruise vacation opportunity, exclusively for museum members. The cruise, aboard the brand new Cunard Queen Mary 2, will sail for eleven days and ten nights.

Departing for London from New York City on June 19, 2004, the cruise will host ten special seminars at sea presented by the president of Mystic Seaport Museum, Douglas H. Teesson, and president emeritus of the National Maritime Historical Society, Peter Stanford.

The QM2 is the longest, tallest, widest, and fastest ship ever built. Passengers may choose from eight different restaurants for dining, and all food and entertainment are included. In London, guests will enjoy accommodations for four nights at a superior first-class hotel with full English breakfast daily. Prices start at $2,465, including return airfare from London to New York City. A portion of the cruise fee will be donated to the Calvert Marine Museum.

For cruise information and brochures, please call VanGuard Cruises at 1-800-624-7718 or visit www.cruisevanguard.com/maritime. When making cruise reservations, please do not forget to mention the Calvert Marine Museum when you call.

MEMBERS’ TRIP - WASHINGTON CAPITALS ACTION

Members - Get ready for National Hockey League action as the Washington Capitals host the Florida Panthers on November 22 at the MCI Arena in Washington. Game time is at 7:00 p.m. Your $35.00 fee includes one Mezzanine Ends/ Side Balcony ticket, chartered bus to/from the game, a hamburger, bag of chips, soda, and a Caps baseball cap. Gate prices for the ticket, food, and hat would be $67, so you save $32 by being a CMMS Member, not to mention the added bonus of complimentary bus service!!

Game attendees should meet at the Calvert Marine Museum at 4:30 p.m. for bus load-in. Another pick-up will be scheduled in Prince Frederick around 5:00 p.m. Exact times will be available closer to the game date. Please call Debra Strozier in the Membership Office at 410-326-2042 to reserve your space.

WATERSIDE CONCERTS INCREASE MEMBERSHIP

Thanks in part to the help of Bob Dylan and Martina McBride, Waterside Music Series’ latest performers, CMMS membership has welcomed 570 new members since April, including 197 since July 1. Since museum members can order concert tickets about a month before public sale, many music fans joined CMMS to ensure themselves a ticket. This proved to be a good plan as both shows sold out of premium seating before public sales opened. Thank you again for your continued support. Watch the Bugeye Times and www.calvertmarinemuseum.com for updated concert information.

MUSEUM STAFF CHANGES

Lori Cole has been promoted from permanent part-time interpreter to education assistant in the Education Department, a full-time position, replacing Bob Boxwell who has left CMMS. Lori has been with the museum as both a volunteer and staff member for about ten years, and brings with her a very strong biology background. Lori is currently working on a degree in education. Pat Murphy began as a seasonal interpreter, and found it to be so much fun that he worked both summer and winter seasons. He has now become a permanent part of the Education Department, taking Lori’s place as a permanent part-time interpreter.

REMEMBER THE MUSEUM STORE FOR HOLIDAY SHOPPING

The museum store is an excellent place for many items on your holiday shopping list. Members benefit from 20 percent discounts during the Members’ Yule Party on December 7 and during the Solomons Christmas Walk on Friday evening, December 12, and Saturday and Sunday, December 13 and 14. The store will also provide help with wrapping presents on Friday evening and Saturday of the Christmas Walk weekend.

YOU BENEFIT FROM WONDERFUL PRESENTS, AND CMMS BENEFITS FROM YOUR SUPPORT!
SUMMER 2003 – A BUSY TIME AT CMM

This summer saw a variety of events at the museum, some new and some old favorites with new attractions.

— OTTERS —

The museum’s otters have a newly enlarged home! Two new otters now entertain CMM visitors in an extension of the former habitat, including a land area and additional small pool.

Cutting the ribbon for the opening of the new habitat on August 16 were (left to right): CMM director Doug Alves, estuarine biology curator Ken Kaufmeyer, aquarist Paula Bohaska (who tends the otters), and exhibits curator Jimmy Langley, whose department created the new habitat.

Museum visitors (right) view the new glass-enclosed extension to the original otter pool, an area reached easily by the otters.

On Sunday, August 3, the Sultana, a reproduction of an eighteenth-century schooner, visited the museum for public “open house” and brief cruises on the Patuxent River. Docking at the J. C. Lore and Sons Oyster House exhibit provided an excellent location for viewing the schooner. CMM photos by Paul Berry.
CRADLE OF INVASION

The sixth annual Cradle of Invasion celebration on August 8 through 10 provided both serious and lighthearted moments.

The site for a memorial for World War II veterans, located at the end of the Dowell Peninsula, site of the Naval Amphibious Training Base, was marked by a wreath-laying ceremony and a model of the proposed memorial – at the left in this photo. Participating are (left to right): Mary Loew, wife of Commander Alan Loew, last commanding officer of the Amphibious Training Base; C. Douglass Alves Jr., CMM director; Lt. Paul Evers, CHC, USNR, Patuxent River Naval Air Station; Capt. Dane C. Swanson, commanding officer, Patuxent River Naval Air Station; and Bob Finn, Assistant Secretary for Outreach, Maryland Department of Veterans Affairs.

CMM photo by Bob Hall

One of the popular living history reenactments was the use of a flame thrower by marines in the field across from CMM.

CMM photo by Bob Hall

In a more light-hearted mood, the 1940s night club and fashion show on August 8, featured "Mae West," as portrayed by county commissioner Linda Kelley, and on August 9, an "Abbott and Costello" show with impersonators Bill Riley and Joe Zeigler (left and right), all seen here with CMM director Doug Alves.

CMM photo by Bob Hall

WATERSIDE MUSIC SERIES

Ralph's Dodge/Jeep and Cumberland & Ed's, LLC, welcomed the Number 1 Female Country Vocalist, Martha McBride, to CMM's Washington Gas Pavilion on August 30. This exciting sold-out concert attracted over 200 new members to the museum and sold nearly 60 percent of its tickets to members alone. The Waterside Music Series is the largest museum fundraiser, and would not be such a success without the continuing support of our sponsors, volunteers, members, community, and staff. Thank you to all who made it a success.

CMM photo by Bob Hall
A “Revolution in Power” - Marine Inboard Engines

of the Great Depression, however, the business closed in 1936, and although it reopened for a while during World War II, no more recreational boats were produced.

The gasoline engine also found a ready market in the fishing industry. The Oysterman and Fisherman of May 1913 confidently reported that “The Chesapeake region... has felt the influence of the commercial motorboat as have few other sections of the country.” According to the same source, the number of motorboats documented on June 30, 1912, at the various customs houses on the bay numbered 9,749 craft of all sizes. The marine engine made the waterman more productive while dispensing with the drudgery of oars and the unpredictability of sail.

Starting in the early years of the twentieth century, engines were installed in increasing numbers of work boats that had been built for sail. The museum's Wm. B. Tennison is a classic example. Built as a two-masted sailing bugeye in 1899, she was converted to power in 1906-07. Her masts and centerboard were removed and a pilothouse added over the engine, a 37-1/2 horsepower Palmer. In this manner she went from an oyster dredge boat to oyster buyboat. Large numbers of “one-lungers” were installed in oyster tonging canoes, and stationary gasoline engines were rapidly introduced into the pound net fishery and menhaden fishery for the purpose of powering winches. In Maryland, an 1865 law prevented the installation of a motor in an oyster dredge boat, but by late century there were motors installed in the yawl boats that all large sailing vessels carried. A five-horsepower, “one-lunger” was typical. The power yawl boat pushing from behind or pulling from ahead allowed the sailing vessel to move during periods of calm or to maneuver better in tight anchorages and restricted waters. Early yawl boats were descended from sailing craft with round-bottom lines, but the later yawl boats or push boats developed V-bottom hulls.

One of the greatest benefits to the Chesapeake oyster dredgers was the introduction of the gasoline-powered oyster dredge winders. Up until around 1908 most boats were equipped with hand winders that required hard manual labor to winch in the heavy oyster dredges. Power winders eliminated much of the backbreaking work and danger inherent in the old method. The Hettinger Engine Company of Bridgeton, New Jersey, was one of the biggest manufacturers of this machinery. They still equip many of the surviving sailing oyster dredge boats.

The two-cycle engine was ideally suited to the slow-speed work boats of the early years of the twentieth century, but about 1912 four-cycle engines began to replace them. This was due in part to the aging of the very early engines and the better fuel efficiency of the four-cycle engines. Up until the 1930s, 1.5- to 7-horsepower single-cylinder engines, turning from 400 to 700 rpm were widely used. Larger four-cycle engines could produce up to forty horsepower with four cylinders. Few commercial motorboat engines of the time exceeded 100 horsepower.

The two-cycle engine did have the advantage of the ease with which the motor could be run, reversed, and repaired. Its simplicity allowed the waterman to do most of his own maintenance and repairs, thus contributing to self-sufficiency and keeping costs down. But by the early 1930s the few surviving two-cycle inboard engines were on their last legs. By the mid-1920s most manufacturers had switched over to four-cycle engines, which over the years had improved dramatically in reliability and durability. They were also becoming lighter and more compact and proved somewhat better suited to the higher speeds that customers wanted, although the years of the great depression stifled real progress on the entire small-boat industry. There were really few big changes in the hulls, and early attempts to get more horsepower and speed out of new engine designs were not particularly successful.

The typical small cruiser for the amateur yachtsman of the 1930s still cruised at about ten knots as they had for the previous twenty years. The marine engines of the late 1920s and early 1930s weighed almost as much as those of 1912, but without a reduction gear could not move efficiently the existing hulls through the water. All of that would change after World War II.
For working watermen, however, there was another significant factor in the decline in the early 1920s in use of the two-cycle marine engine: this was the increased use of discarded automobile engines after World War I into the depression years of the 1930s. The working watermen knew that the thin cast-iron water jackets of the automotive engines would not last more that a season or two in salt water, but they could be bought for almost nothing. Rather than go to the expense of a keel cooler or a heat exchanger so that freshwater would be circulated in the engine block, the watermen would simply junk the rusted out engine and put in another used engine. The fact that the propeller didn’t meet the hull efficiently was simply ignored, and a smaller propeller put on in place of the larger, more efficient prop that had served well with the smaller original two- or four-cycle one-lunger. Model T Ford engines were particularly liked due to their unique transmission and reverse gear.

An additional factor was that automobile engines (not discards) could be converted cheaply for use in a boat, but this brought the need for a reduction gear to match efficiently the high rpm of the engine to the low rpm of the propeller. The cost of a suitable reduction gear often exceeded the cost of a new engine, and therefore many of the early 600 to 800 rpm four-cycle engines, some dating to the early 1920s, hung on in commercial service in the larger vessels until the mid-1950s. It would take a post-WWII major change in hull designs, materials, and construction techniques to mate efficiently the higher speed modern engines to the new hulls.

Shortly after the end of World War II, there was a shift to diesel engines in the larger commercial small boats, prompted by the fact that several thousand new Gray Marine 6-71 diesels, built for landing craft, were declared surplus by the government. These marvelous engines were snapped up by the commercial watermen for use in the larger forty- to sixty-foot class of small boats. This single act killed off any of the pre-World War II diesel engine designs that the marine engine makers were toiling to produce when World War II hit the industry.

William B. Rogers Jr., writing in the April 10, 1924, issue of Motor Boat, prophesized: “With the experience of the past two decades behind the industry, and with the assured great increase in boat popularity as an incentive, progress must follow, rapid, sound and steady progress which will make dreams come true that I do not care to, and do not quite dare to place in type.” Progress did follow, but not perhaps in the way William Rogers had envisioned. Larger and more powerful marine gasoline engines would be produced, long after World War II, but by only a handful of large companies. Essentially all the larger small boat marine engines produced today are conversions of automotive or truck engines, whether they be gasoline or diesel. For larger commercial fishing vessels and recreational craft, the appeal of the diesel with its high torque and increased fire safety aspects is almost universal. There are today, however, still an extensive array of small diesel and gasoline marine engines that are widely available for sailboat auxiliary power and similar applications.

For those interested in further reading, Stan Grayson’s The Old Marine Engine - The World of the One-Lunger, is highly recommended. More recently, Mr. Grayson has written a two-volume work, Engines Afloat. The first volume focuses on the gasoline era and the second volume on the gasoline/diesel era. Information on old marine engines is also available on the Internet. Andrew Menkart runs the informative website www.oldmarineengine.com (with photos) that serves as a forum for collectors and restorers and a source of information on pre-1940 inboard engines. Beautifully restored and running engines are displayed at the Calvert Marine Museum’s Chesapeake Antique Boat & Marine Engine Show, the first weekend in May, and by collectors Dick Day and William Fiege during Patuxent River Appreciation Days in October.
VOLUNTEER SPOTLIGHT—

PATUXENT SMALL CRAFT CENTER – LOTS OF VOLUNTEER EFFORT!

Small boats have been an interest of CMM since its early days. In the fall of 1976, with a grant from the state, work began on the Small Craft Shed to house the growing collection of small craft and marine engines. When the present boat basin was created in 1984, the building was moved to its location alongside the basin. Some repair work on small craft was possible in this building, but it was very limited.

In late 1984, the Patuxent Small Craft Guild (established in the spring of 1981) joined in the museum’s plans to build a new small craft skills preservation pavilion near the Drum Point Lighthouse. This work was supported by a grant from the Maryland National [Bank] Foundation, with the work performed by staff and volunteers. Although this provided a covered area in which to restore CMM small craft and to work on other boats, it was relatively small and was not protected from the elements on one side, thus limiting its use during cold weather. To its credit, the pavilion was used to restore some significant boats, including most recently the Sewell draketail. But something larger and enclosed was needed.

Under the overall guidance of Richard Dodds, curator of maritime history, a new grant was obtained for architectural services from the Maryland Museum Assistance Program. A later Maryland state bond bill, matched by CMM, provided the funds to expand and enclose the existing building, with the work completed in the winter of 2002 by contractor Hegarty and Associates. From then on, the completion of the interior of the building was in the hands of volunteers, guided by Mr. Dodds and museum boatwright George Surgent. A tally of the volunteer hours in 2003 shows that twelve volunteers put in nearly 1,000 hours on this project. Their efforts were recognized during the ribbon-cutting ceremony on May 3, 2003. Given the history of the Patuxent Small Craft Guild – extolled in issues of the Bugeye Times for fall 1997 and winter 2002-2003 – it is not surprising that this tremendous effort helped to create their new work place.

The new Patuxent Small Craft Center will be used not only for restoring CMM small craft, it will also be used for educational purposes. This summer, for example, a two-day class in building a small canoe from marine plywood attracted thirteen potential boatbuilders who built six boats. This class was taught by George Surgent, with help from volunteer members of the guild. Another class is planned for November. The Patuxent Small Craft Guild is now accommodated in a building fitting to their needs and abilities. 🛥️