= HMS Warrior (1860) =

HMS Warrior was a 40 @-@ gun steam @-@ powered armoured frigate built for the Royal Navy in 1859 ? 61 . She was the name ship of the Warrior @-@ class ironclads . Warrior and her sister ship HMS Black Prince were the first armour @-@ plated , iron @-@ hulled warships , and were built in response to France 's launching in 1859 of the first ocean @-@ going ironclad warship , the wooden @-@ hulled Gloire . Warrior conducted a publicity tour of Great Britain in 1863 and spent her active career with the Channel Squadron . Obsolescent following the 1871 launching of the mastless and more capable HMS Devastation , she was placed in reserve in 1875 , and was " paid off " ? that is , decommissioned ? in 1883 .

She subsequently served as a storeship and depot ship , and in 1904 was assigned to the Royal Navy 's torpedo training school . The ship was converted into an oil jetty in 1927 and remained in that role until 1979 , at which point she was donated by the Navy to the Maritime Trust for restoration . The restoration process took eight years , during which many of her features and fittings were either restored or recreated . When this was finished she returned to Portsmouth as a museum ship . Listed as part of the National Historic Fleet , Warrior has been based in Portsmouth since 1987 .

= = Background = =

The launching of the steam @-@ powered ship of the line Napoléon by France in 1850 began an arms race between France and Britain that lasted for a decade . The destruction of a wooden Ottoman fleet by a Russian fleet firing explosive shells in the Battle of Sinop , early in the Crimean War , followed by the destruction of Russian coastal fortifications during the Battle of Kinburn in the Crimean War by French armoured floating batteries , and tests against armour plates , showed the superiority of ironclads over unarmoured ships . France 's launching in 1859 of the first ocean @-@ going ironclad warship , the wooden @-@ hulled Gloire , upset the balance of power by neutralising the British investment in wooden ships of the line and started an invasion scare in Britain , as the Royal Navy lacked any ships that could counter Gloire and her two sisters . The situation was perceived to be so serious that Queen Victoria asked the Admiralty if the navy was adequate for the tasks that it would have to perform in wartime . Warrior and her sister were ordered in response .

The Admiralty initially specified that the ship should be capable of 15 knots (28 km / h ; 17 mph) , and have a full set of sails for world @-@ wide cruising range . Iron construction was chosen as it gave the best trade @-@ off between speed and protection ; an iron hull was lighter than a wooden one of the same size and shape , giving more capacity for guns , armour and engines .

= = Design and description = =

= = = Overview = = =

Chief Constructor of the Navy Isaac Watts and Chief Engineer Thomas Lloyd designed the ship . To minimise risk they copied the hull design of the large wooden frigate HMS Mersey , modifying it for iron construction and to accommodate an armoured box , or citadel , amidships along the single gun deck , which protected most of the ship 's guns . Ships with this configuration of guns and armour are classified as broadside ironclads .

The Warrior @-@ class design used many well @-@ proven technologies that had been used in ocean @-@ going ships for years , including her iron hull , steam engine , and screw propeller ; only her wrought @-@ iron armour was a major technological advance . Naval architect and historian David K. Brown wrote , " What made [Warrior] truly novel was the way in which these individual aspects were blended together , making her the biggest and most powerful warship in the world . " Being faster , better armoured and harder to hit than her rivals , she was superior to any existing naval ship . The Admiralty immediately stopped the construction of all wooden ships of the line , and

ordered another eleven ironclads over the next few years . Jacky Fisher , who was the ship 's gunnery lieutenant in 1863 ? 64 , later wrote that in spite of this , most people did not realise at the time what a significant change it would bring about : " It certainly was not appreciated that this , our first armourclad ship of war , would cause a fundamental change in what had been in vogue for something like a thousand years . "

Although built in response to Gloire , the Warriors had a very different operational concept from the French ship , which was meant to replace wooden ships of the line . The Warriors were designed by Watts as 40 @-@ gun armoured frigates and were not intended to stand in the line of battle , as the Admiralty was uncertain about their ability to withstand concentrated fire from wooden two- and three @-@ deck ships of the line . Unlike Gloire , they were planned to be fast enough to force battle on a fleeing enemy and to control the range at which a battle was fought to their own advantage . In contrast to Gloire 's square profile , Warrior has a clipper bow , but she is twice as long as a typical clipper ship .

HMS Warrior is 380 feet 2 inches (115 @.@ 9 m) long between perpendiculars and 420 feet (128 @.@ 0 m) long overall . She has a beam of 58 feet 4 inches (17 @.@ 8 m) and a draught of 26 feet 9 inches (8 @.@ 2 m) . The ship displaces 9 @,@ 137 long tons (9 @,@ 284 t) and has a tonnage of 6 @,@ 109 tons burthen . The ship 's length made her relatively unmanoeuvrable , making it harder for her to use her strengthened stem for ramming , an ancient tactic that was coming back into use at the time . The ends of the hull are subdivided by watertight transverse bulkheads and decks into 92 compartments , and the hull has a double bottom underneath the engine and boiler rooms .

= = = Armament = = =

The armament of the Warrior @-@ class ships was originally intended to be forty smoothbore , muzzle @-@ loading 68 @-@ pounder guns , nineteen on each side on the main deck and one each fore and aft as chase guns on the upper deck . The 7 @.@ 9 @-@ inch (201 mm) 68 @-@ pounder had a range of 3 @,@ 200 yards (2 @,@ 900 m) with solid shot . During construction the armament was changed to include ten Armstrong 110 @-@ pounder guns , an early rifled breech loader (RBL) design , along with twenty @-@ six 68 @-@ pounders , and four RBL Armstrong 40 @-@ pounder guns with a calibre of 4 @.@ 75 inches (121 mm) and a maximum range of 3 @,@ 800 yards (3 @,@ 500 m) . It had been planned to replace all the 68 @-@ pounders with the innovative 110 @-@ pounder , whose 7 @-@ inch (178 mm) shell could reach 4 @,@ 000 yards (3 @,@ 700 m) , but poor results in armour @-@ penetration tests halted this . During the first use in action of a 110 @-@ pounder aboard HMS Euryalus in 1863 , the gun was incorrectly loaded and the vent piece was blown out of the breech when fired . They were labour @-@ intensive to load and fire , and were henceforth only used with a reduced propellant charge , which left them ineffective against ironclad ships .

All the guns could fire either solid shot or explosive shells . The 68 @-@ pounders could also fire hollow iron shells filled with molten iron , which was heated in a furnace between the two forward boilers . The 40 @-@ pounder Armstrong guns were replaced with a better design of the same calibre in 1863 . Warrior 's original armament was replaced during her 1864 ? 67 refit with twenty @-@ four 7 @-@ inch and four 8 @-@ inch (203 mm) rifled muzzle @-@ loading (RML) guns . The ship also received four RBL Armstrong 20 @-@ pounders for use as saluting guns . The RML 8 @-@ inch gun could penetrate 9 @.@ 6 inches (244 mm) of wrought iron armour at the muzzle , and the RML 7 @-@ inch gun could pierce 7 @.@ 7 inches (196 mm) .

= = = Armour = = =

Warrior 's armour consisted of 4 @.@ 5 inches (114 mm) of wrought iron backed by 18 inches (457 mm) of teak . The iron armour was made up of 3 @-@ by @-@ 12 @-@ foot (0 @.@ 91 by 3 @.@ 66 m) plates that interlocked via the tongue and groove method . It was bolted through the teak to the iron hull . The teak consisted of two 9 @-@ inch @-@ thick (229 mm) layers laid at

right angles to each other ; they strengthened the armour by damping the shock waves caused by the impact of shells that would otherwise break the bolts connecting the armour to the hull . Based on tests at Shoeburyness in October 1861 when the Warrior was launched , it " was practically invulnerable to the ordnance at the time in use " .

The armour covered the middle 213 feet (64 @.@ 9 m) of the ship and extended 16 feet (4 @.@ 9 m) above the waterline and 6 feet (1 @.@ 8 m) below it . The guns on the main deck were protected from raking fire by 4 @.@ 5 @-@ inch transverse bulkheads . The ends of the ship were unprotected , but were subdivided into watertight compartments to minimise flooding . The lack of armour at the stern meant that the steering gear and rudder were vulnerable .

= = = Crew = = =

The ship 's crew comprised 50 officers and 656 ratings in 1863 . The majority of the crew had to do physically demanding tasks ; one such duty was the raising of the heaviest manually hauled anchors in maritime history . The day @-@ to @-@ day life of her crew differed little from those on the navy 's traditional wooden @-@ hulled vessels .

The majority of the crew lived on the single gun deck of the Warrior ; these crewmen slept in hammocks slung from the sides and deck beams , with up to 18 men between each pair of guns . The officers berthed in the rear of the ship in small individual cabins ; the wardroom was also the officers ' mess . The captain had two spacious , well @-@ furnished cabins .

Of the ratings , 122 were Royal Marines . As an experiment during the ship 's first commission , all of Warrior 's marines were from Royal Marine Artillery ; subsequently some marine infantrymen were assigned as was the usual naval practice . The marines manned the aft section of guns and slung their hammocks between the crew 's accommodation and the officers ' cabins .

= = = Propulsion = = =

Warrior had a two @-@ cylinder trunk steam engine , made by John Penn and Sons , driving a single propeller using steam provided by 10 rectangular boilers . The engine produced a total of 5 @,@ 772 indicated horsepower (4 @,@ 304 kW) during Warrior 's sea trials on 1 April 1868 giving a speed of 14 @.@ 08 knots (26 @.@ 08 km / h ; 16 @.@ 20 mph) under steam alone . The ship carried 853 long tons (867 t) of coal , enough to steam 2 @,@ 100 nautical miles (3 @,@ 900 km ; 2 @,@ 400 mi) at 11 knots (20 km / h ; 13 mph) .

The ironclad was ship rigged and had a sail area of 48 @,@ 400 square feet (4 @,@ 497 m2) . Warrior reached 13 knots (24 km / h ; 15 mph) under sail alone , 2 knots (3 @.@ 7 km / h ; 2 @.@ 3 mph) faster than her sister ship Black Prince . She had the largest hoisting propeller ever made ; it weighed 26 long tons (26 t) , and 600 men could raise it into the ship to reduce drag while under sail . To further reduce drag , both her funnels were telescopic and could be lowered . Under sail and steam together , the ship once reached 17 @.@ 5 knots (32 @.@ 4 km / h ; 20 @.@ 1 mph) against the tide while running from Portsmouth to Plymouth .

= = Construction and service = =

Warrior was ordered on 11 May 1859 from Thames Ironworks and Shipbuilding Company in Blackwall , London . The ship was laid down some time after 6 June 1859 on the West Ham side of Bow Creek when the P & O ocean liner Seine was launched , and the slipway was reinforced to support Warrior 's weight . Full @-@ scale production of the ship 's iron began in August , and the construction probably began in mid @-@ August . Indecision by the Admiralty and frequent design changes caused many delays and nearly drove her builders bankrupt before a grant of £ 50 @,@ 000 was awarded to keep them solvent . Her launching on 29 December 1860 was during the coldest winter for 50 years . She was frozen to her slipway and required the use of hydraulic rams , additional tugs , and dockworkers running from side to side on the upper deck to rock her free . Warrior was commissioned in August 1861 to conduct her sea trials ; she was completed on 24

October for £ 377 @,@ 292 , almost twice the cost of a contemporary wooden ship of the line . Between March and June 1862 , defects exposed during her trials were rectified , and damage repaired . Changes included the fitting of a lighter bowsprit and a shorter jib boom , along with the provision of extra heads amidships .

The ship was initially assigned to the Channel Squadron under the command of Captain Arthur Cochrane . In March 1863 , Warrior escorted the royal yacht that brought Princess Alexandra of Denmark to Britain to marry the Prince of Wales . The princess appreciated the conduct of the ship 's crew , and requested Admiral Sir Michael Seymour to convey that " she was much pleased " to the ship . Cochrane had the message engraved on a brass plate and fitted to the ship 's wheel . Her descendant , Princess Alexandra of Kent , is now patron of the HMS Warrior 1860 Trust .

In mid @-@ 1863 the Channel Fleet toured British ports for 12 weeks ; the ship received 300 @,@ 000 visitors , including as many as 13 @,@ 000 a day in port .

Warrior began a refit in November 1864 during which the Armstrong guns , which had not proved successful in use , were removed and her armament was upgraded to the latest rifled muzzle @-@ loading guns . She was recommissioned in 1867 , under the command of Captain Julian Corbett , to relieve her sister as the guardship at Queenstown in Ireland , but instead both ships participated in the Fleet Review held on 17 July in honour of the visits made by the Khedive of Egypt and the Sultan of Turkey to Britain . After the review , the Admiralty paid off the ship on 24 July ; the following day Warrior was recommissioned with Captain Henry Boys in command . After working up at Spithead , she sailed to join the Channel Squadron on 24 September . At the end of the year she was deployed to Osborne Bay to guard Queen Victoria at Osborne House . The Fenian Rising was under way , and there was intelligence suggesting that the Queen might be in danger from Irish nationalists . While Warrior was performing this duty , she received an informal visit from the Queen . The ship was part of a squadron that escorted the royal yacht HMY Victoria and Albert II to Dublin in April 1868 for an official visit by the Prince of Wales , the future King Edward VII . In August , while cruising to Scotland , Warrior collided with HMS Royal Oak , losing her figurehead and jib boom and smashing Royal Oak 's cutter . Boys was court @-@ martialled and acquitted over the incident .

From 4 to 28 July 1868 , Warrior , with Black Prince and the wooden paddle frigate HMS Terrible , towed a specially built floating drydock , large enough to accommodate ironclads , 2 @,@ 700 nmi (5 @,@ 000 km ; 3 @,@ 100 mi) across the Atlantic from Madeira to Bermuda . Upon her return to England in late August , Boys was relieved by Captain Frederick Stirling . After a refit to clean her hull and replace the figurehead lost in the collision , Warrior rejoined the Channel Squadron . On 2 March 1870 , Captain Henry Glyn assumed command of the ship . While returning from a joint cruise with the Mediterranean Fleet , the ship was present when HMS Captain was lost during a severe storm on 7 September . Further cruises followed , including trips to Madeira and Gibraltar . Warrior narrowly missed colliding with HMS Agincourt when she was following her out of Gibraltar and Agincourt grounded on Pearl Rock .

The rapid evolution of warship design , for which Warrior was partly responsible , meant that she started to become obsolete only ten years after she had been launched . In 1871 the Royal Navy commissioned its first mastless capital ship , HMS Devastation . In the absence of masts , the main armament could move from the broadside and traverse more freely from a higher position . In the same year , Warrior began a refit that lasted until 1875 ; it added a poop deck and steam capstan , a shorter bowsprit , and replacement boilers . In April 1875 , the ship was recommissioned , and assigned to the First Reserve , where she served as a guardship at Portland . In this role , she went on annual summer cruises to various ports . During the Russo @-@ Turkish War of 1877 ? 78 , she was mobilised due to concerns that the victorious Russians might be about to attack Constantinople , forcing Great Britain to intervene , but nothing transpired and Warrior cruised to Bantry Bay instead . In April 1881 she was transferred to the Clyde District , where she served as guardship until 31 May 1883 . Two of her masts were discovered to be rotten that month and with no replacements available , the ship was decommissioned and the masts removed .

Warrior was reclassified as a " screw battle ship , third class , armoured " in 1887 and again in May 1892 as a first @-@ class armoured cruiser , although no changes were made to her . She was

considered for modernization as late as 1894 , but this was rejected as uneconomical after at least one new boiler was installed . The ship was used as a storage hulk from May 1901 to July 1902 . In preparation for her service as a depot ship for a flotilla of destroyers , the ship had her engines and boilers removed and part of her upper deck roofed over . Warrior served in this role from 1902 to 31 March 1904 , and was then assigned to the Portsmouth @-@ based Vernon , the Royal Navy 's torpedo @-@ training school . Her name was changed to Vernon III that month and six new Belleville boilers and four electric generators were installed so that she could supply steam and electricity to the neighbouring hulks that made up Vernon . Most of the upper deck was roofed over to form classrooms for radio training , and her fore and mizzen masts were reinstalled . In October 1923 , the school was transferred to a newly built shore installation , rendering Warrior and her companion hulks redundant ; Warrior resumed her name on 1 October and the Royal Navy declared her redundant six months later .

The mass scrapping of obsolete ships after World War I had caused a downturn in demand for scrap iron by the time the Navy decided to sell off Warrior on 2 April 1925 . There was no commercial interest in scrapping the old ship , and she remained at Portsmouth for another four years . She was modified into a mooring jetty beginning on 22 October 1927 . This entailed the removal of all of her equipment and masts other than her boilers and generators , and the installation of two diesel @-@ driven emergency pumps . The space under the poop was converted into accommodation for a shipkeeper and his family . The hulk was towed to her new home , Pembroke Dock in Wales , on 13 March 1929 where she served as a floating oil jetty . For the next fifty years , the ship lay just offshore from an oil depot at Llanion Cove . The Navy covered the ship 's upper deck with a thick layer of concrete during one of her maintenance dockings before World War II . In the war , she served as a base ship for coastal minesweepers and , on 27 August 1942 , was renamed as Oil Fuel Hulk C77 to release her name for use by a light aircraft carrier , HMS Warrior , then under construction . She refuelled 5 @,@ 000 ships during her service at Llanion Cove .

= = Preservation = =

Restoring Warrior was discussed in the early 1960s , but did not develop into a serious project . In 1967 , the Greater London Council proposed to restore the ship as an attraction in London , but Warrior was still required in Pembroke by the Royal Navy and the scheme went no further . In 1968 the Duke of Edinburgh chaired a meeting that discussed preserving and restoring Warrior and other historic vessels , and a year later The Maritime Trust was established to save the decrepit ironclad and other historic ships . The Maritime Trust and a major supporter , the Manifold Trust led by the Conservative MP John Smith , maintained an interest in Warrior . In 1976 the Royal Navy announced that the Llanion Oil Depot would close in 1978 , and the Manifold Trust began to seek funds to restore her . With the promise of financial support for restoration , the Royal Navy donated the ship to the trust in 1979 . The Ship 's Preservation Trust acquired ownership of the ship in 1983 ; it became the Warrior Preservation Trust in 1985 .

= = = Restoration = = =

In August 1979 Warrior began her 800 @-@ mile (1 @,@ 300 km) journey to her temporary home in the Coal Dock at Hartlepool for restoration as a museum ship . She arrived on 2 September 1979 and began the £ 9 million restoration project , largely funded by the Manifold Trust . The Maritime Trust decided to restore Warrior to her 1862 condition with the aim that no further major work would be necessary for the next 20 years . The first two years of the restoration were generally devoted to safely removing material added after her first commission , like the poop deck and the 200 long tons (200 t) of concrete decking . Intensive research was done to find detailed descriptions of the ship and her equipment as of 1862 to make the restoration as accurate as economically feasible . Sources included surviving official records , and the papers of those who had served on the ship during her active service . Bolt @-@ holes and ridges in the paint gave clues to the location of some

fittings and fixtures , and the sketch plans of Midshipman Henry Murray , found in Captain Cochrane 's Letter Book , showed the locations of the armament , moveable fittings and stores .

Work on carving a replacement for Warrior 's figurehead , which was destroyed in the 1960s , began in 1981 using photographs of the original as a guide . The 12 @-@ foot (3 @.@ 7 m) work @-@ in @-@ progress was displayed at the 1982 London International Boat Show with the carvers still at work ; it dominated coverage of the show . Before it was finished in mid @-@ 1983 , the figurehead appeared on the BBC children 's television programme Blue Peter . For much of 1984 it was displayed at the Main Gate of the Portsmouth Royal Dockyard . It was mounted on the ship on 6 February 1985 .

Replacement of the ship 's 86 @-@ foot @-@ 3 @-@ inch (26 @.@ 3 m) -tall , 42 @-@ inch (1 @.@ 1 m) -wide lower masts in wood was not feasible , so they were made of steel tube cut and welded to shape , with a ladder inside each mast to allow access to the platforms on the masts . The three masts and the bowsprit were stepped in place between September 1984 and February 1985 . Warrior 's engines , boilers and auxiliary machinery were considered too expensive to rebuild , so replicas were built from sheet steel with a few components made from cast iron to duplicate the look of the real equipment . The replica engines can rotate slowly , using electrical power , to allow visitors to imagine how they might have looked in operation .

The Woolwich Rotunda Artillery Museum and the States of Jersey lent examples of Warrior 's original primary guns , the muzzle @-@ loading 68 @-@ pounder and the breech @-@ loading 110 @-@ pounder , which were used as moulds for fibreglass replicas . The Armstrong guns were built with working breeches ; they , and the muzzles of all the guns , had to be sealed to prevent people leaving rubbish in them . Little information was available on the wooden gun carriages despite extensive research , and a prototype had to be developed and tested before they could be built .

= = = Museum ship = = =

In 1985 a new berth beside Portsmouth Harbour railway station was dredged , and a new jetty constructed in preparation for Warrior 's arrival in Portsmouth . The ship left Hartlepool on 12 June 1987 under the command of Captain Collin Allen and was towed 390 miles (630 km) to the Solent in four days . When she entered Portsmouth Harbour she was welcomed by thousands of people lining the town walls and shore , and by over 90 boats and ships . She opened as a museum on 27 July . The restored ironclad was renamed HMS Warrior (1860) to avoid confusion with the Northwood Headquarters , commissioned as HMS Warrior in 1963 , which was at the time the operational headquarters of the Royal Navy .

Warrior is part of the National Historic Fleet , and is berthed in the Portsmouth Historic Dockyard complex , which is also the home of Nelson 's flagship HMS Victory and the Tudor warship Mary Rose . In 1995 she received over 280 @,@ 000 visitors , and the whole dockyard receives between 400 @,@ 000 and 500 @,@ 000 visitors annually . Warrior is still managed by the Warrior Preservation Trust and is used as a venue for weddings and functions to generate funds for her maintenance . The trust also has a collection of material related to the ship and an archive ; the latter is not yet open to the public .